

## *Appendix 5-E*

### *Traffic Impact Assessment*

HARPER CREEK PROJECT

**Application for an Environmental Assessment Certificate /  
Environmental Impact Statement**

REPORT FOR



**YELLOWHEAD  
MINING INC.**

# Harper Creek Project

## Traffic Impact Assessment

October 2014 Update

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# 1 INTRODUCTION

McElhanney Consulting Services Ltd. was commissioned by Yellowhead Mining Inc. to prepare this Traffic Impact Study (TIS) for the development of a greenfield, 70,000 tpd copper, gold, silver mine located South of Vavenby, British Columbia. A bankable feasibility study was completed on March 29, 2012.

## 1.1 LOCATION

The Harper Creek deposit is located approximately 13 kilometres south of the community of Vavenby BC. Vavenby is located in the Thompson-Nicola Regional District and is approximately 150 kilometres northeast of Kamloops. The proposed mine is shown in Figure 1-1. Copper Concentrates will be shipped from the mine to a new rail load-out facility located at the now closed Weyerhaeuser Mill in Vavenby.

*Figure 1-1 Project Location*



## 1.2 STUDY PURPOSE AND OBJECTIVE

The objectives of this study include:

- Identify potential impacts due to traffic generated by the operation of the proposed Harper Creek Mine on the local highway network and local roads in Vavenby.
- Quantify anticipated delay that could be anticipated with the development of the Mine.
- Identify opportunities to minimize potential adverse effects, especially in areas that are determined to be possible “bottlenecks” in terms of capacity or risk.
- Perform a haul-route assessment on the paved infrastructure from the mine to the proposed rail load-out facility located at the former Weyerhaeuser mill.
- Identify improvements that could be made to the road network to improve performance and safety.

## 1.3 STUDY AREA

The primary study area encompasses the truck haul route on Vavenby Bridge Road between Vavenby Mountain FSR and Highway 5 (Primary Route) as well as the intersection of Highway 5 and Birch Island Lost Creek Road (BILC Road) (major intersection on secondary route). Both routes have are shown on Figure 1-2. The primary route will be used during both construction and operations whereas the secondary route through Birch Island would only be used periodically during construction and occasionally during operations. The reason for using the secondary route through Birch Island is that overload permits are not available on Vavenby Bridge whereas they are possible on the Birch Island Bridge. Concentrate will be hauled between the Vavenby load out facility (Weyerhaeuser Site) and the mine (Figure 1-3).

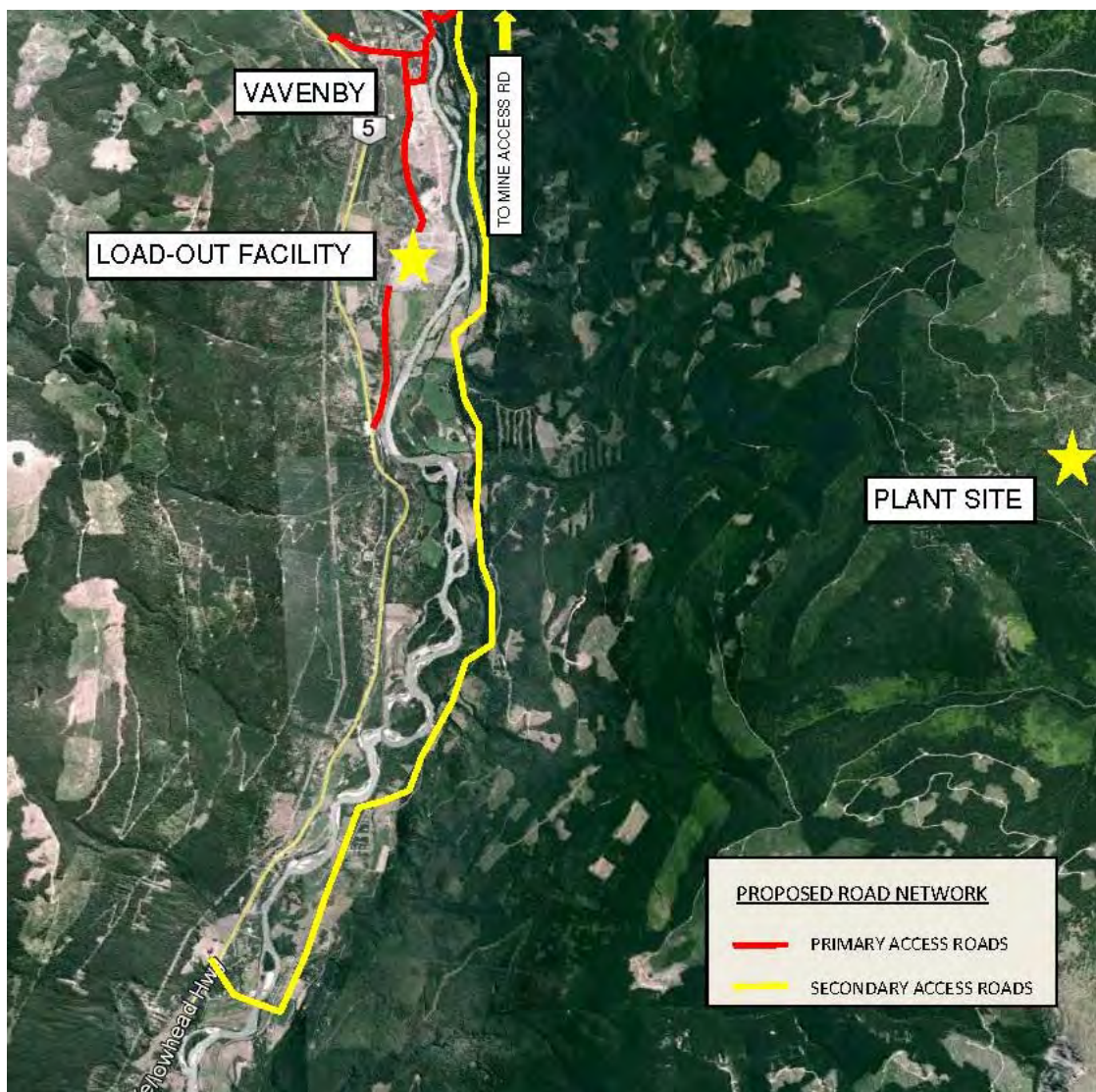
The four major intersections in the study area are

1. Vavenby Bridge Road / Highway 5
2. Vavenby Bridge Road / McCorvie Road
3. Vavenby Bridge Road / Capostinsky Road
4. Birch Island Lost Creek Road / Highway 5



A site visit was performed with Yellowhead Mining, Ministry of Transportation and Infrastructure (MoTI) and the Commercial Vehicle Safety and Enforcement (CVSE) branch on April 2, 2014. The entire secondary route (Birch Island Lost Creek Road route) was assessed. The primary outcome of this meeting was that MoTI will work with Yellowhead Mining to ensure that this route can be used for short term heavy haul. Additional traffic management in the form of a construction traffic management plan (TMP) should be performed prior to mine construction.

Figure 1-2 Study Area





*Figure 1-3 Concentrate Haul Route*



## 2 PROPOSED PROJECT

### 2.1 PROJECT DESCRIPTION

The proposed Harper Creek Mine is a 70,000 TPD Copper, Gold, Silver mine. The project is located southwest of Vavenby, BC and will be accessed via existing gravel forest service roads. Employees will reside in the region therefore; a work camp will only be required during the construction phase and not the operation phase. Mine employees will drive and park at a new 100± stall parking lot to be located at the proposed load-out / office complex at the former Weyerhaeuser Mill site. Staff will then be transported to the mine via bus. The existing KP road will remain gated and the Vavenby Bridge Road and Highway 5 intersection will be the primary access point for all mine traffic.

This study does not include an assessment of traffic during construction or decommissioning. It is recommended that these two phases of mine development be analyzed in the form of a traffic management plan prior to commencement of construction.

### 2.2 STUDY HORIZONS

The planned mine opening date is 2018. As the mine has a mine life of 28 years, both the mid mine life (2032) and end of mine life (2045) horizons have been included in the analysis. 2045 was used as the end analysis year as this is the last year of full mine operations.

## 3 TRAFFIC DATA

### 3.1 EXISTING TRAFFIC VOLUMES

Traffic count data was collected manually over three days between September 11 and September 13, 2012 at the following intersections:

1. Highway 5 / Vavenby Bridge Road – **September 11**
2. Highway 5 / Birch Island Lost Creek Road – **September 13**
3. Vavenby Bridge Road / McCorvie Road – **September 12**
4. Vavenby Bridge Road / Capostinsky Road – **September 12**

Traffic counts were performed between the hours of 6AM-9AM, 11AM-1PM, and 3PM – 6PM to capture the peak traffic periods.

The manual counts were adjusted to be representative of the Summer Average Daily Traffic (SADT) by multiplying counts by factors calculated using statistics from Ministry of Transportation and Infrastructure permanent count station P-23-3NS located south of Tete Jaune Cache. Raw traffic count data has been included in Appendix A.

#### 3.1.1 Seasonal Adjustment

Traffic volumes for thru movements on Hwy 5 were adjusted upwards by a factor of 1.46 to be representative of the Summer Average Daily Traffic (SADT). Similarly, an adjustment factor of 1.05 was used on all local movements in Vavenby. The local adjustment factor was estimated to be lower as there are very traffic generators in the Vavenby Community that would suggest that the SADT would be much higher than the traffic data collected in September. Traffic on Highway 5 is very seasonal with volumes in the summer being almost three times higher than during the winter. Figure 3-1 shows the MADT values for 2010 at Tete Jaune Cache. The adjustment factors used are conservative as traffic characteristics in the corridor tend to be more seasonal the further north you travel. Most likely, traffic characteristics in Vavenby fall between highly seasonal and seasonal. To be conservative, it has been assumed that traffic on this highway segment is highly seasonal.

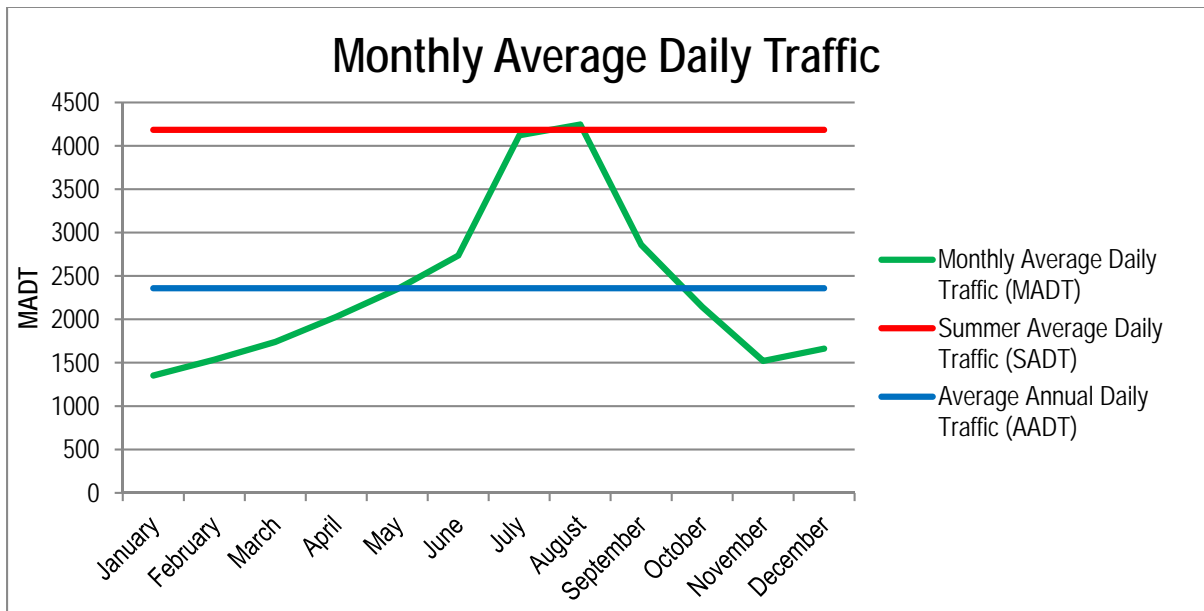
3.1.2 Seasonal Sensitivity Analysis

A sensitivity analysis was performed for the 2045 scenario as seasonal adjustment factors were based on highly seasonal data. Data used in this study was adjusted upwards by a factor of 1.46 to reflect seasonal variations in traffic. Other factors of 1.0 and 1.2 were used to see how level of service varied with lower seasonal adjustments as it could be argued that traffic in Vavenby has less seasonal variation than traffic in Tete Jaune Cache. Based on the analysis, using seasonal adjustments showing less seasonality results in better overall performance of the VBR Highway 5 intersection. Delay for existing Highway traffic is negligible with only minor changes for southbound left turning vehicles.

**Hwy 5 VBR Intersection**

Scenario	ICU		Southbound			Northbound			Westbound			Eastbound (Gated)		
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2045 PM	A	LOS	A	A	A	A	A	A	B	B	B			
Adj 1.0	4.5	Delay	8.0	0.0	0.0	0.0	0.0	0.0	14.8	14.8	14.8			
2045 PM	A	LOS	A	A	A	A	A	A	C	C	C			
Adj 1.2	4.6	Delay	8.2	0.0	0.0	0.0	0.0	0.0	17.8	17.8	17.8			
2045 PM	A	LOS	A	A	A	A	A	A	C	C	C			
Adj 1.46	4.7	Delay	8.2	0.0	0.0	0.0	0.0	0.0	19.3	19.3	19.3			

Figure 3-1 MADT Values Count Station P-23-3NS

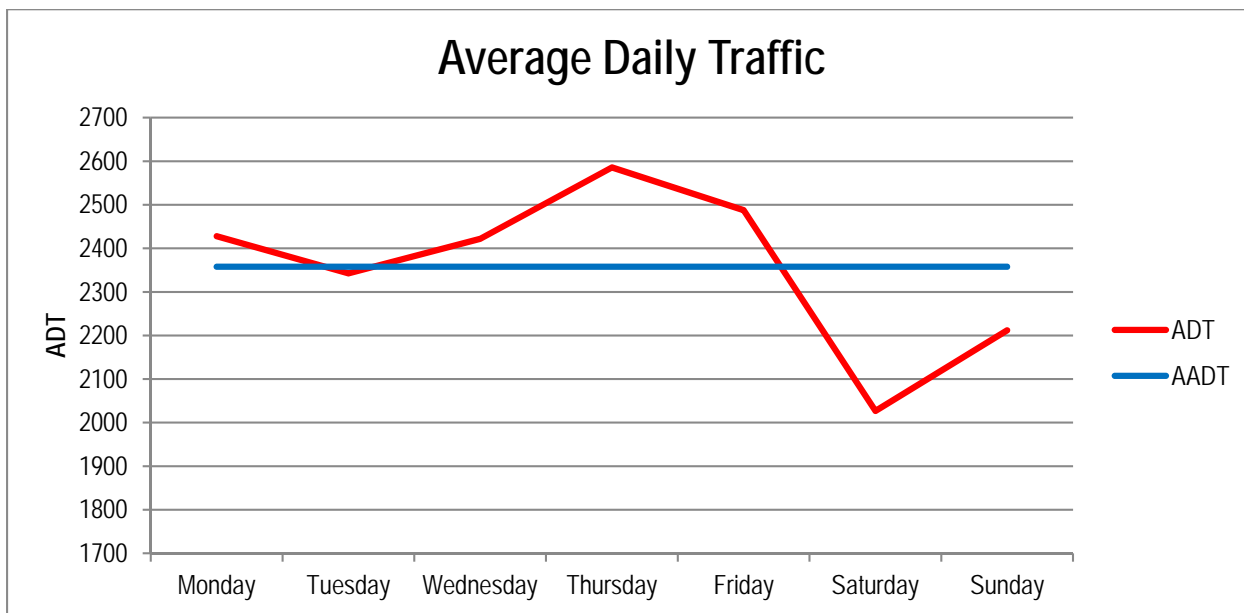




### 3.1.3 Daily Adjustment

As traffic counts were not performed concurrently, the data has been adjusted according to the day of the week in which the data was collected. Factors of between 1.006 and 0.991 were used to adjust the count data to represent the ADT volume. Figure 3-2 shows the distribution of traffic by day of the week.

Figure 3-2 Traffic by Day of Week



### 3.1.4 Adjusted Count Data

Tables 3-1 and 3-2 summarize the adjusted 2012 peak hour volumes at the four study intersections.

Table 3-1 Existing 2012 Traffic in AM Peak Hour

NS Street	EW Street	Southbound			Northbound			Westbound			Eastbound		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Hwy 5	VBR	2	46	0	0	83	20	30	1	6	0	0	0
VBR	McCorvie Rd	9	4	25	7	3	1	2	1	2	18	1	4
VBR	Capostinsky Rd	15	1	3	0	0	1	1	0	11	5	0	0
Hwy 5	BILC Rd	6	67	0	0	77	0	8	0	5	0	0	0

*Table 3-2 Existing 2012 Traffic in PM Peak Hour*

NS Street	EW Street	Southbound			Northbound			Westbound			Eastbound		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Hwy 5	VBR	8	89	0	0	85	38	65	1	3	0	1	0
VBR	McCorvie Rd	6	33	5	12	15	30	7	3	16	50	4	12
VBR	Capostinsky Rd	10	9	2	0	18	0	0	0	21	9	0	0
Hwy 5	BILC Rd	6	192	0	0	92	4	5	0	9	0	0	0

### 3.2 EXISTING LOGGING TRUCK TRAFFIC

Currently, the logging industry is the primary industrial user on both Vavenby Bridge Road and Birch Island Lost Creek Road. Logging traffic typically picks up at 3AM and runs throughout the day with shifts staggered to prevent trucks from platooning at the mill. Existing logging truck traffic on Vavenby Bridge Road is between 12 and 25 loads per day (two-way volume of 24 to 50 vpd). Other traffic in support of the Canfor Vavenby Bridge would be in addition to this with higher traffic volumes occurring during shift changes.

Recent mill closures in Vavenby have resulted in a decrease in local traffic. The now closed Weyerhaeuser Mill historically generated between 40 and 120 loads of wood per day (80 to 240 vpd) excluding staff and additional support requirements. As a consequence of the downturn in the forest sector, the population of Vavenby has decreased. Between 2006 and 2011 the population of Vavenby and surrounding area declined from 1672 to 1536 or -8.1%. This population decline is apparent in the town as there appears to be a surplus of vacant residential properties.

### 3.3 SEASONAL LOAD RESTRICTIONS

Both proposed trucking routes are subject to 70% axle loading restrictions during certain months of the year. Additional storage may be required at the mine site to store supplies during periods with road restrictions. Additional loads may be required during these load restrictions however as road restrictions will fall outside of the peak travel months of June-September the potential impact from a few additional trucks will not impact the outcomes of this study. The Birch Island Lost Creek road is subject to 50% axle loading restrictions.

### 3.4 PROJECTED GROWTH

In lieu of the historical decline in population and industrial traffic, it has been assumed that traffic volumes will grow steadily through to 2045. This is a standard practice that helps account for traffic growth generated from standard background economic growth. Traffic statistics were available at MoTI permanent count station P-23-3NS located south of Tete Jaune Cache for the years 2002 to 2011. This was the closest count station that had a traffic profile that matched our site specifics. Data from this count station has shown annual growth of 1.5% over the past 9 years (Figure 3-3). This growth factor of 1.5 % has been applied to all count data in the study area for projecting future traffic volumes. Tables 3-3 to 3-8 show projected background traffic volumes for the 2018, 2032 and 2045 study horizons.

Figure 3-3 Historic Traffic Volumes on Hwy 5 - Tete Jaune Cache

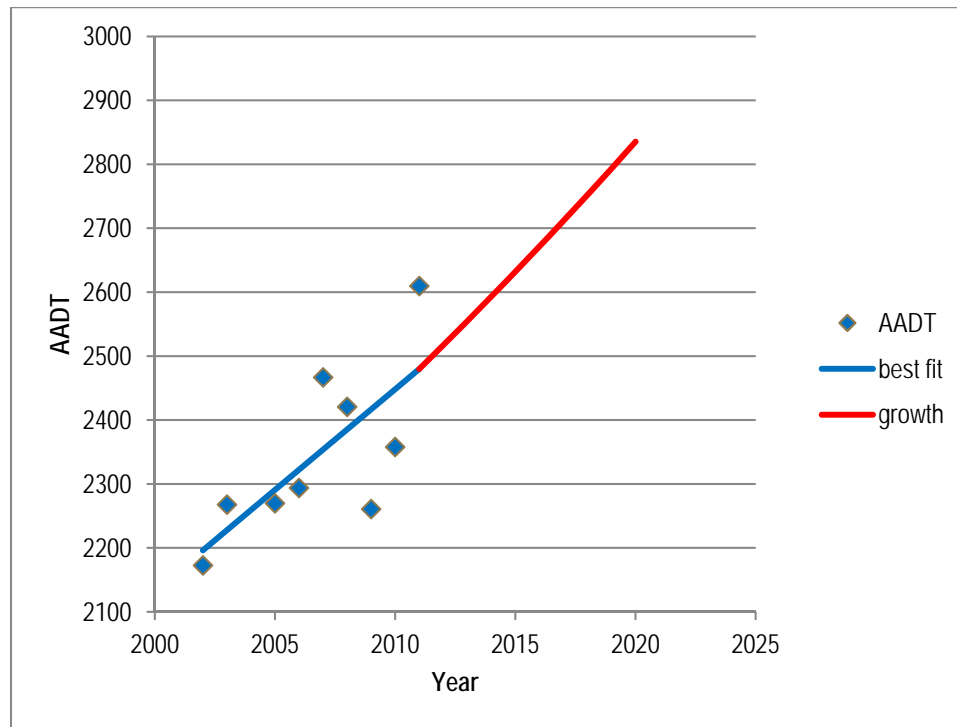


Table 3-3 Projected 2018 Traffic in AM Peak Hour

NS Street	EW Street	Southbound			Northbound			Westbound			Eastbound		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Hwy 5	VBR	2	74	0	0	134	23	35	1	7	0	0	0
VBR	McCorvie Rd	10	4	28	8	3	1	2	1	2	20	1	4
VBR	Capostinsky Rd	17	1	3	0	0	1	1	0	12	6	0	0
Hwy 5	BILC Rd	6	98	0	0	112	0	8	0	5	0	0	0

Table 3-4 Projected 2018 Traffic in PM Peak Hour

NS Street	EW Street	Southbound			Northbound			Westbound			Eastbound		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Hwy 5	VBR	9	143	0	0	137	44	75	1	3	0	1	0
VBR	McCorvie Rd	7	37	6	13	17	34	8	3	18	56	4	13
VBR	Capostinsky Rd	11	10	2	0	20	0	0	0	23	10	0	0
Hwy 5	BILC Rd	6	280	0	0	134	4	5	0	9	0	0	0



*Table 3-5 Projected 2032 Traffic in AM Peak Hour*

NS Street	EW Street	Southbound			Northbound			Westbound			Eastbound		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Hwy 5	VBR	3	91	0	0	165	28	43	1	9	0	0	0
VBR	McCorvie Rd	12	6	34	10	4	1	3	1	3	25	1	6
VBR	Capostinsky Rd	21	1	4	0	0	1	1	0	15	7	0	0
Hwy 5	BILC Rd	8	120	0	0	138	0	10	0	6	0	0	0

*Table 3-6 Projected 2032 Traffic in PM Peak Hour*

NS Street	EW Street	Southbound			Northbound			Westbound			Eastbound		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Hwy 5	VBR	11	177	0	0	169	54	93	1	4	0	1	0
VBR	McCorvie Rd	8	45	7	17	21	41	10	4	22	69	6	17
VBR	Capostinsky Rd	14	12	3	0	25	0	0	0	29	12	0	0
Hwy 5	BILC Rd	8	345	0	0	165	5	6	0	12	0	0	0

*Table 3-7 Projected 2045 Traffic in AM Peak Hour*

NS Street	EW Street	Southbound			Northbound			Westbound			Eastbound		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Hwy 5	VBR	3	111	0	0	200	35	52	2	10	0	0	0
VBR	McCorvie Rd	15	7	42	12	5	2	3	2	3	30	2	7
VBR	Capostinsky Rd	25	2	5	0	0	2	2	0	18	8	0	0
Hwy 5	BILC Rd	9	146	0	0	168	0	13	0	8	0	0	0

*Table 3-8 Projected 2045 Traffic in PM Peak Hour*

NS Street	EW Street	Southbound			Northbound			Westbound			Eastbound		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Hwy 5	VBR	14	214	0	0	205	66	112	2	5	0	2	0
VBR	McCorvie Rd	10	55	8	20	25	50	12	5	27	84	7	20
VBR	Capostinsky Rd	17	15	3	0	30	0	0	0	35	15	0	0
Hwy 5	BILC Rd	9	419	0	0	201	6	8	0	14	0	0	0

### 3.5 DEVELOPMENT OF MINE TRAFFIC

For a typical traffic impact study, trip generation for the future development is completed using the trip generation rates found in the most current edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual. However, for unique land uses such as mines, remote recreation areas and construction traffic impact studies, representative trip generation rates cannot be found in the ITE Trip Generation Manual. Therefore, the trip generation must be completed from first principles, which calculates the expected number of trips generated by the mine site based on the work force size, presence of a work camp, material deliveries, maintenance operations, shipment of mined materials and anticipated site visitors.

#### 3.5.1 Work Force

It is anticipated that all of the mining workers, including the on-site mine management will drive to the load-out / office facility located on the former Weyerhaeuser Mill site. Workers will work in 12 hour shifts with shift changes occurring at 6am and 6pm respectively. Workers will be bused to the site from a parking located at the office.

#### 3.5.2 Material Deliveries

All materials to the site are expected to be delivered by truck with the frequency of the deliveries dependent on the type of material being delivered. We have assumed that all material deliveries would occur on a weekday during regular working hours, i.e. 8:00 am to 5:00 pm.

#### 3.5.3 Shipment of Concentrate

Mining concentrate generated from the mining operations would be shipped from the mine site via 40 tonne capacity tandem truck. Shipments of concentrate are anticipated to occur seven days per week and 24 hours per day. Approximately 21 shipments of concentrate will be shipped between the mine and load-out each day. Concentrate shipments between the rail load-out and the mill will take place 24 hours a day 7 days a week. Concentrate haul route shown in Figure 1-3.

#### 3.5.4 Site Visitors

Visitors such as suppliers, vendors, material testers, expeditors, etc. are expected to drive to the site in passenger vehicles. They would arrive and/or depart seven days per week.

Table 3-9 summarizes the anticipated vehicle trips to the site.

Table 3-9 Development Traffic During Operations

Truck Type	Load	Annual trips (two-way)	Monthly Trips (two-way)	Max Daily Trips (two-way)	one-way trips veh/day	VBR Hwy 5 to McCorvie	McCorvie Rd to Office	VBR McCorvie to Mine
<b>Process Plant Supplies</b>								
	Liners	10	5.0	2	4	4	-	4
	Balls	195	16.3	1	2	2	-	2
	Liners	17	1.4	1	2	2	-	2
	Balls	351	29.2	2	4	4	-	4
	Liners	31	2.6	1	2	2	-	2
	Grinding media	6	0.5	1	2	2		2
<b>Reagents</b>								
40 Tonne Tandem	PAX	13	1.1	1	2	2		2
	MIBC	6	0.5	1	2	2		2
	Lime	767	63.9	3	6	6		6
	HCl	1	0.1	1	2	2		2
	Flocculent	1	0.1	1	2	2		2
<b>Staffing</b>								
Buses	Hourly Staff	2100	175	6	12		12	12
Passenger Vehicles	Commuter Traffic	35700	4987	102	204	204	204	-
Passenger Vehicles	Supervisors	4200	350	12	24		24	24
	Engineering + operations	7350	613	21	42		42	42
	Miscellaneous	2100	175	6	12	12	12	12
<b>Miscellaneous</b>								
20 Tonne Tractor Trailer	Maintenance & Warehouse	700	58	2	4	4		4
20,000L Tanker	Diesel	500	42	2	4	4		4
Concentrate Trucks (40t)		7840	653	21	43		43	43
		Annual Trips	Monthly Trips	Daily Trips (two-way)	Daily Trips (one-way)	Volume veh/day		
	<b>Total</b>	<b>61888</b>	<b>7174</b>	<b>187</b>	<b>375</b>	<b>254</b>	<b>337</b>	<b>171</b>

### 3.6 DISTRIBUTION OF MINE TRAFFIC

Traffic Generated by the proposed mine was distributed through the road network based on the following assumptions:

- 90% of trips are generated from Hwy 5 South and 10% of trips generated from Hwy 5 North.
- All mine employees travel to and from the site office via McCorvie Rd
- All plant and consumables travel directly from Hwy 5 to the mine
- Concentrate trucks run between Site office and Mine via McCorvie Rd

Peak hour development traffic volumes have been shown in Tables 3-10 and 3-11.

*Table 3-10 Development Traffic During AM Peak Period*

NS Street	EW Street	Southbound			Northbound			Westbound			Eastbound		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Hwy 5	VBR	5	0	0	0	0	41	41	0	4	0	0	0
VBR	McCorvie Rd	0	3	43	6	2	0	0	0	0	43	0	9
VBR	Capostinsky Rd	12	0	0	0	0	0	0	0	8	0	0	0
Hwy 5	BILC Rd	0	41	0	0	41	0	0	0	0	0	0	0

*Table 3-11 Development Traffic During PM Peak Period*

NS Street	EW Street	Southbound			Northbound			Westbound			Eastbound		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Hwy 5	VBR	4	0	0	0	0	41	41	0	5	0	0	0
VBR	McCorvie Rd	0	2	43	9	3	0	0	0	0	43	0	6
VBR	Capostinsky Rd	8	0	0	0	0	0	0	0	12	0	0	0
Hwy 5	BILC Rd	0	41	0	0	41	0	0	0	0	0	0	0



### 3.7 COMBINED TRAFFIC VOLUMES

The combined traffic volumes are shown in the following tables for 2015, 2029, and 2043 scenarios. Tables 3-12 to 3-17 show projected combined traffic volumes for the 2015, 2029 and 2043 study horizons. These volumes show both background and development traffic.

*Table 3-12 Total 2018 Traffic in AM Peak Hour*

NS Street	EW Street	Southbound			Northbound			Westbound			Eastbound		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Hwy 5	VBR	7	74	0	0	134	64	76	1	11	0	0	0
VBR	McCorvie Rd	10	7	71	14	5	1	2	1	2	63	1	13
VBR	Capostinsky Rd	29	1	3	0	0	1	1	0	20	6	0	0
Hwy 5	BILC Rd	6	139	0	0	153	0	8	0	5	0	0	0

*Table 3-13 Total 2018 Traffic in PM Peak Hour*

NS Street	EW Street	Southbound			Northbound			Westbound			Eastbound		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Hwy 5	VBR	13	143	0	0	137	85	116	1	8	0	1	0
VBR	McCorvie Rd	7	39	49	22	20	34	8	3	18	99	4	19
VBR	Capostinsky Rd	19	10	2	0	20	0	0	0	35	10	0	0
Hwy 5	BILC Rd	6	321	0	0	175	4	5	0	9	0	0	0

*Table 3-14 Total 2032 Traffic in AM Peak Hour*

NS Street	EW Street	Southbound			Northbound			Westbound			Eastbound		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Hwy 5	VBR	8	91	0	0	165	69	84	1	13	0	0	0
VBR	McCorvie Rd	12	9	77	16	6	1	3	1	3	68	1	15
VBR	Capostinsky Rd	33	1	4	0	0	1	1	0	23	7	0	0
Hwy 5	BILC Rd	8	161	0	0	179	0	10	0	6	0	0	0

*Table 3-15 Total 2032 Traffic in PM Peak Hour*

NS Street	EW Street	Southbound			Northbound			Westbound			Eastbound		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Hwy 5	VBR	15	177	0	0	169	95	134	1	9	0	1	0
VBR	McCorvie Rd	8	47	50	26	24	41	10	4	22	112	6	23
VBR	Capostinsky Rd	22	12	3	0	25	0	0	0	41	12	0	0
Hwy 5	BILC Rd	8	386	0	0	206	5	6	0	12	0	0	0

*Table 3-16 Total 2045 Traffic in AM Peak Hour*

NS Street	EW Street	Southbound			Northbound			Westbound			Eastbound		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Hwy 5	VBR	8	111	0	0	200	76	93	2	14	0	0	0
VBR	McCorvie Rd	15	10	85	18	7	2	3	2	3	73	2	16
VBR	Capostinsky Rd	37	2	5	0	0	2	2	0	26	8	0	0
Hwy 5	BILC Rd	9	187	0	0	209	0	13	0	8	0	0	0

*Table 3-17 Total 2045 Traffic in PM Peak Hour*

NS Street	EW Street	Southbound			Northbound			Westbound			Eastbound		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Hwy 5	VBR	18	214	0	0	205	107	153	2	10	0	2	0
VBR	McCorvie Rd	10	57	51	29	28	50	12	5	27	127	7	26
VBR	Capostinsky Rd	25	15	3	0	30	0	0	0	47	15	0	0
Hwy 5	BILC Rd	9	460	0	0	242	6	8	0	14	0	0	0

## 4 TRAFFIC ANALYSIS RESULTS

The study intersections were modeled using Synchro and Sim Traffic Software (Vers. 7) to determine the expected operation of the intersections for the 2015, 2029, and 2043 peak periods. For each identified scenario, the performance of each movement is provided in terms of the Level of Service and the average expected delay per vehicle (in seconds). Volumes to Capacity ratios are shown in the analysis output in Appendix B. A description of Level of Service and its correlation to delay is shown in Table 4-1 below. All future scenarios were modeled assuming no geometric improvements.

Table 4-1 Level of Service and Delay Criteria

LOS	LOS Description	Two Way Stop Controlled (TWSC) Intersections Control Delay (seconds per vehicle)
A	Very low delay; most vehicles do not stop <b>(Excellent)</b>	Less than 10.0
B	Higher delay; more vehicles stop <b>(Very Good)</b>	Between 10.0 and 15.0
C	Higher level of congestion; number of vehicles stopping is significant, although many still pass through intersection without stopping <b>(Good)</b>	Between 15.0 and 25.0
D	Congestion becomes noticeable; vehicles must sometimes wait through more than one red light, many vehicles stop <b>(Satisfactory)</b>	Between 25.0 and 35.0
E	Vehicles must often wait through more than one red light; considered by many agencies as the limit of acceptable delay <b>(Marginal)</b>	Between 25.0 and 50.0
F	This level is considered to be unacceptable to most drivers; occurs when arrival flow rates exceed the capacity of the intersection <b>(Unacceptable)</b>	Greater than 50.0

#### 4.1 HIGHWAY 5 AND VAVENBY BRIDGE ROAD

Table 4-2 Hwy 5 and Vavenby Bridge Road AM Peak Hour Performance

Scenario	ICU		Southbound			Northbound			Westbound			Eastbound		
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2012 Existing	A 2.0	LOS Delay	A 7.8	A 0.0	A 0.0	A 0.0	A 0.0	A 0.0	A 10.0	A 10.0	A 10.0	A 0.0	A 0.0	A 0.0
2018 Background	A 1.8	LOS Delay	A 7.9	A 0.0	A 0.0	A 0.0	A 0.0	A 0.0	B 10.8	B 10.8	B 10.8	A 0.0	A 0.0	A 0.0
2018 Combined	A 3.0	LOS Delay	A 7.9	A 0.0	A 0.0	A 0.0	A 0.0	A 0.0	B 11.5	B 11.5	B 11.5	A 0.0	A 0.0	A 0.0
2032 Background	A 1.9	LOS Delay	A 8.0	A 0.0	A 0.0	A 0.0	A 0.0	A 0.0	B 11.5	B 11.5	B 11.5	A 0.0	A 0.0	A 0.0
2032 Combined	A 3.0	LOS Delay	A 8.0	A 0.0	A 0.0	A 0.0	A 0.0	A 0.0	B 12.4	B 12.4	B 12.4	A 0.0	A 0.0	A 0.0
2045 Background	A 2.0	LOS Delay	A 8.1	A 0.0	A 0.0	A 0.0	A 0.0	A 0.0	B 12.3	B 12.3	B 12.3	A 0.0	A 0.0	A 0.0
2045 Combined	A 3.2	LOS Delay	A 8.1	A 0.0	A 0.0	A 0.0	A 0.0	A 0.0	B 13.5	B 13.5	B 13.5	A 0.0	A 0.0	A 0.0

Table 4-3 Hwy 5 and Vavenby Bridge Road PM Peak Hour Performance

Scenario	ICU		Southbound			Northbound			Westbound			Eastbound		
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2012 Existing	A 2.9	LOS Delay	A 7.8	A 0.0	A 0.0	A 0.0	A 0.0	A 0.0	B 11.2	B 11.2	B 11.2	B 10.6	B 10.6	B 10.6
2018 Background	A 2.8	LOS Delay	A 7.9	A 0.0	A 0.0	A 0.0	A 0.0	A 0.0	B 12.9	B 12.9	B 12.9	B 11.6	B 11.6	B 11.6
2018 Combined	A 3.6	LOS Delay	A 8.0	A 0.0	A 0.0	A 0.0	A 0.0	A 0.0	B 13.8	B 13.8	B 13.8	B 11.7	B 11.7	B 11.7
2032 Background	A 3.2	LOS Delay	A 8.1	A 0.0	A 0.0	A 0.0	A 0.0	A 0.0	B 14.8	B 14.8	B 14.8	B 12.4	B 12.4	B 12.4
2032 Combined	A 4.4	LOS Delay	A 8.1	A 0.0	A 0.0	A 0.0	A 0.0	A 0.0	C 16.6	C 16.6	C 16.6	B 12.5	B 12.5	B 12.5
2045 Background	A 3.5	LOS Delay	A 8.1	A 0.0	A 0.0	A 0.0	A 0.0	A 0.0	C 17.1	C 17.1	C 17.1	B 13.2	B 13.2	B 13.2
2045 Combined	A 4.7	LOS Delay	A 8.2	A 0.0	A 0.0	A 0.0	A 0.0	A 0.0	C 19.3	C 19.3	C 19.3	B 13.3	B 13.3	B 13.3

The Synchro analysis shows that the intersection is expected to perform at an acceptable Level of Service for all peak hours until 2045. Delay is expected to be manageable as no movement is expected to experience more than 19.3 seconds of delay. The proposed development traffic creates a negligible impact on the performance of the intersection with no movement experiencing more than a 2.2 second increase in delay. Delay at the intersection is expected to be slightly greater during the PM peak hour than the AM peak hour.

**Identified constraints / hazards:**

- Intersection has raised medians separating the left turn lanes from thru movements. This is potentially hazardous as the posted speed on this segment of Highway 5 is 100 km/h. typically median curbing is only installed on roads with posted speed limits of 80 km/h and above. It has been observed however, that this is a standard geometric design practice in the corridor.
- Left turn bays allow for refuge of vehicles only and have little length available for deceleration.
- One PDO “property damage only” incident has been reported at this intersection in the past 5 years.

**Recommendations:**

- Project level guidance signage should be installed north and south of the intersection to give sufficient warning to traffic heading to the mine.

*Figure 4-1 Hwy 5 and Vavenby Bridge Road - Looking South*



*Figure 4-2 Hwy 5 and Vavenby Bridge Road - Looking East*





## 4.2 VAVENBY BRIDGE ROAD AND MCCORVIE RD

Table 4-4 Vavenby Bridge Road and McCorvie Road AM Peak Hour Performance

Scenario	ICU		Southbound			Northbound			Westbound			Eastbound		
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2012 Existing	A 4.9	LOS Delay	A 1.8	A 1.8	A 1.8	A 4.9	A 4.9	A 4.9	A 9.0	A 9.0	A 9.0	A 9.2	A 9.2	A 9.2
2018 Background	A 4.9	LOS Delay	A 1.8	A 1.8	A 1.8	A 5.1	A 5.1	A 5.1	A 9.0	A 9.0	A 9.0	A 9.2	A 9.2	A 9.2
2018 Combined	A 5.3	LOS Delay	A 0.9	A 0.9	A 0.9	A 5.5	A 5.5	A 5.5	A 9.4	A 9.4	A 9.4	A 10.0	A 10.0	A 10.0
2032 Background	A 5.0	LOS Delay	A 1.7	A 1.7	A 1.7	A 5.2	A 5.2	A 5.2	A 9.1	A 9.1	A 9.1	A 9.4	A 9.4	A 9.4
2032 Combined	A 5.4	LOS Delay	A 1.0	A 1.0	A 1.0	A 5.5	A 5.5	A 5.5	A 9.4	A 9.4	A 9.4	B 10.2	B 10.2	B 10.2
2045 Background	A 5.1	LOS Delay	A 1.8	A 1.8	A 1.8	A 4.9	A 4.9	A 4.9	A 9.3	A 9.3	A 9.3	A 9.6	A 9.6	A 9.6
2045 Combined	A 3.4	LOS Delay	A 1.1	A 1.1	A 1.1	A 5.3	A 5.3	A 5.3	A 9.7	A 9.7	A 9.7	B 10.5	B 10.5	B 10.5

Table 4-5 Vavenby Bridge Road and McCorvie Road PM Peak Hour Performance

Scenario	ICU		Southbound			Northbound			Westbound			Eastbound		
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2012 Existing	A 5.4	LOS Delay	A 0.9	A 0.9	A 0.9	A 1.7	A 1.7	A 1.7	A 9.2	A 9.2	A 9.2	B 10.1	B 10.1	B 10.1
2018 Background	A 5.5	LOS Delay	A 1.1	A 1.1	A 1.1	A 1.6	A 1.6	A 1.6	A 9.3	A 9.3	A 9.3	B 10.4	B 10.4	B 10.4
2018 Combined	A 5.9	LOS Delay	A 0.6	A 0.6	A 0.6	A 2.4	A 2.4	A 2.4	A 9.6	A 9.6	A 9.6	B 11.5	B 11.5	B 11.5
2032 Background	A 5.8	LOS Delay	A 1.0	A 1.0	A 1.0	A 1.8	A 1.8	A 1.8	A 9.5	A 9.5	A 9.5	B 11.0	B 11.0	B 11.0
2032 Combined	A 6.3	LOS Delay	A 0.6	A 0.6	A 0.6	A 2.4	A 2.4	A 2.4	A 9.9	A 9.9	A 9.9	B 12.4	B 12.4	B 12.4
2045 Background	A 6.2	LOS Delay	A 1.1	A 1.1	A 1.1	A 1.8	A 1.8	A 1.8	A 9.8	A 9.8	A 9.8	B 11.8	B 11.8	B 11.8
2045 Combined	A 6.8	LOS Delay	A 0.7	A 0.7	A 0.7	A 2.4	A 2.4	A 2.4	B 10.1	B 10.1	B 10.1	B 13.6	B 13.6	B 13.6

The Synchro analysis shows that the intersection is expected to perform at an acceptable level of service for all peak hours until 2043. All movements are expected to operate at level of Service B or better with no movement experience a delay of more than 13.4 seconds. The proposed development traffic creates a negligible impact to the intersection performance as no movement is expected to experience an increase in delay of more than 1.7 seconds. Due to platooning caused by a shift change at the mine, additional delay may be experienced by left turning vehicles from McCorvie Road. This delay however is expected to last less than 20 minutes.

**Identified constraints / hazards:**

- Intersection is adjacent to CN mainline and freight trains could cause significant and delay which consequently will cause platooning (Figure 4-3)
- Gas station / convenience store located adjacent to the intersection does not have a formal entrance / exit. Movements made from the store may have an implied right-of-way due to the lack of signage. Signage improvements for the store driveway are impractical due to lack of maneuvering space on the store property (Figure 4-4).
- Trucks making southbound right movements track off the asphalt and have started wearing away the gravel shoulder. Very few truck movements for the proposed mine will be required to make this movement as they will travel north-south through the intersection (Figure 4-5)
- No collisions have been reported at this intersection over the past 5 years.

**Recommendations:**

- During detailed design phases of mine development, a swept path analysis should be performed on the study intersections to ensure that the design vehicle tracks on the existing asphalt.
-

*Figure 4-3 McCorvie and Vavenby Bridge Road - CN Crossing*



*Figure 4-4 Vavenby Bridge Road – Vavenby Store*



*Figure 4-5 McCorvie and Vavenby Bridge Road - Truck over-tracking*





### 4.3 VAVENBY BRIDGE ROAD AND CAPOSTINSKY ROAD

Table 4-6 Vavenby Bridge Road and Capostinsky Road AM Peak Hour Performance

Scenario	ICU		Southbound			Northbound			Westbound			Eastbound		
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2012 Existing	A 6.0	LOS Delay	A 8.9	A 8.9	A 8.9	A 8.3	A 8.3	A 8.3	A 0.6	A 0.6	A 0.6	A 7.5	A 7.5	A 7.5
2018 Background	A 5.9	LOS Delay	A 8.9	A 8.9	A 8.9	A 8.3	A 8.3	A 8.3	A 0.6	A 0.6	A 0.6	A 7.5	A 7.5	A 7.5
2018 Combined	A 5.8	LOS Delay	A 9.0	A 9.0	A 9.0	A 8.3	A 8.3	A 8.3	A 0.3	A 0.3	A 0.3	A 7.5	A 7.5	A 7.5
2032 Background	A 6.1	LOS Delay	A 9.0	A 9.0	A 9.0	A 8.3	A 8.3	A 8.3	A 0.5	A 0.5	A 0.5	A 7.5	A 7.5	A 7.5
2032 Combined	A 5.9	LOS Delay	A 9.1	A 9.1	A 9.1	A 8.3	A 8.3	A 8.3	A 0.3	A 0.3	A 0.3	A 7.5	A 7.5	A 7.5
2045 Background	A 6.1	LOS Delay	A 9.1	A 9.1	A 9.1	A 8.3	A 8.3	A 8.3	A 0.7	A 0.7	A 0.7	A 7.5	A 7.5	A 7.5
2045 Combined	A 6.0	LOS Delay	A 9.2	A 9.2	A 9.2	A 8.3	A 8.3	A 8.3	A 0.5	A 0.5	A 0.5	A 7.5	A 7.5	A 7.5

Table 4-7 Vavenby Bridge Road and Capostinsky Road PM Peak Hour Performance

Scenario	ICU		Southbound			Northbound			Westbound			Eastbound		
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2012 Existing	A 6.3	LOS Delay	A 9.2	A 9.2	A 9.2	A 9.5	A 9.5	A 9.5	A 0.0	A 0.0	A 0.0	A 7.5	A 7.5	A 7.5
2018 Background	A 6.3	LOS Delay	A 9.3	A 9.3	A 9.3	A 9.5	A 9.5	A 9.5	A 0.0	A 0.0	A 0.0	A 7.5	A 7.5	A 7.5
2018 Combined	A 5.8	LOS Delay	A 9.4	A 9.4	A 9.4	A 9.6	A 9.6	A 9.6	A 0.0	A 0.0	A 0.0	A 7.5	A 7.5	A 7.5
2032 Background	A 6.3	LOS Delay	A 9.4	A 9.4	A 9.4	A 9.6	A 9.6	A 9.6	A 0.0	A 0.0	A 0.0	A 7.5	A 7.5	A 7.5
2032 Combined	A 6.0	LOS Delay	A 9.5	A 9.5	A 9.5	A 9.7	A 9.7	A 9.7	A 0.0	A 0.0	A 0.0	A 7.6	A 7.6	A 7.6
2045 Background	A 6.4	LOS Delay	A 9.6	A 9.6	A 9.6	A 9.8	A 9.8	A 9.8	A 0.0	A 0.0	A 0.0	A 7.5	A 7.5	A 7.5
2045 Combined	A 6.1	LOS Delay	A 9.7	A 9.7	A 9.7	A 9.9	A 9.9	A 9.9	A 0.0	A 0.0	A 0.0	A 7.6	A 7.6	A 7.6

The Synchro analysis shows that the intersection is expected to perform at an acceptable level of service for all peak hours until 2045. All movements are expected to operate at level of Service A with no movement experiencing a delay of more than 9.9 seconds. The proposed development traffic creates a negligible impact to the intersection performance as no movement is expected to experience an increase in delay of more than 0.1 seconds.

**Identified constraints / hazards:**

- Intersection is not easily identifiable from the north approach as stop sign is slightly obscured by dense brush. Additional guide and warning signage would help identify the intersection. (Figure 4-6)
- Trucks are required to off-track when making left and right-turn movements. As the intersection has two-way stop control, and travel speeds are low, vehicle off-tracking should not pose any significant operational challenges. (Figure 4-7)
- Sight distance from the North approach looking west is poor due to private fence being close to the intersection. (Figure 4-8)
- One PDO “property damage only” incident has been reported at this intersection in the past 5 years.

**Recommendations:**

- Install “stop sign ahead” and project guide signage on the north approach to help motorists identify the route to the mine site.
- Clear away excess brush that is located on the right-of-way, notably on the northwest quadrant.
- During detailed design phases of mine development, a swept path analysis should be performed on the study intersections to ensure that the design vehicle tracks on the existing asphalt.



*Figure 4-6 Vavenby Bridge Road and Capostinsky - Looking South*



*Figure 4-7 Vavenby Bridge Road and Capostinsky Road - Turn turning north*



*Figure 4-8 Vavenby Bridge Road and Capostinsky Road - Looking East*



#### 4.4 INTERSECTION OF HWY 5 AND BIRCH ISLAND LOST CREEK ROAD

Table 4-8 Hwy 5 and Birch Island Lost Creek Road AM Peak Hour Performance

Scenario	ICU		Southbound			Northbound			Westbound			Eastbound		
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2012 Existing	A 1.1	LOS Delay	/	/	/	A 9.4	A 9.4	A 9.4	A 0.7	A 0.7	A 0.7	A 0.0	A 0.0	A 0.0
2018 Background	A 0.8	LOS Delay	/	/	/	A 9.9	A 9.9	A 9.9	A 0.5	A 0.5	A 0.5	A 0.0	A 0.0	A 0.0
2018 Combined	A 0.6	LOS Delay	/	/	/	B 10.4	B 10.4	B 10.4	A 0.4	A 0.4	A 0.4	A 0.0	A 0.0	A 0.0
2032 Background	A 0.9	LOS Delay	/	/	/	B 10.2	B 10.2	B 10.2	A 0.6	A 0.6	A 0.6	A 0.0	A 0.0	A 0.0
2032 Combined	A 0.7	LOS Delay	/	/	/	B 10.8	B 10.8	B 10.8	A 0.5	A 0.5	A 0.5	A 0.0	A 0.0	A 0.0
2045 Background	A 0.9	LOS Delay	/	/	/	B 10.7	B 10.7	B 10.7	A 0.6	A 0.6	A 0.6	A 0.0	A 0.0	A 0.0
2045 Combined	A 0.8	LOS Delay	/	/	/	B 11.3	B 11.3	B 11.3	A 0.5	A 0.5	A 0.5	A 0.0	A 0.0	A 0.0

Table 4-9 Hwy 5 and Birch Island Lost Creek Road PM Peak Hour Performance

Scenario	ICU		Southbound			Northbound			Westbound			Eastbound		
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2012 Existing	A 0.6	LOS Delay	/	/	/	A 9.8	A 9.8	A 9.8	A 0.3	A 0.3	A 0.3	A 0.0	A 0.0	A 0.0
2018 Background	A 0.5	LOS Delay	/	/	/	B 10.4	B 10.4	B 10.4	A 0.2	A 0.2	A 0.2	A 0.0	A 0.0	A 0.0
2018 Combined	A 0.5	LOS Delay	/	/	/	B 10.9	B 10.9	B 10.9	A 0.2	A 0.2	A 0.2	A 0.0	A 0.0	A 0.0
2032 Background	A 0.6	LOS Delay	/	/	/	B 10.9	B 10.9	B 10.9	A 0.3	A 0.3	A 0.3	A 0.0	A 0.0	A 0.0
2032 Combined	A 0.5	LOS Delay	/	/	/	B 11.9	B 11.9	B 11.9	A 0.3	A 0.3	A 0.3	A 0.0	A 0.0	A 0.0
2045 Background	A 0.6	LOS Delay	/	/	/	B 11.9	B 11.9	B 11.9	A 0.3	A 0.3	A 0.3	A 0.0	A 0.0	A 0.0
2045 Combined	A 0.6	LOS Delay	/	/	/	B 12.5	B 12.5	B 12.5	A 0.3	A 0.3	A 0.3	A 0.0	A 0.0	A 0.0

The Synchro analysis shows that the intersection is expected to perform at an acceptable level of service for all peak hours until 2045. All movements are expected to operate at level of Service A with no movement experiencing a delay of more than 12.5 seconds. The proposed development traffic creates a negligible impact to the intersection performance as no movement is expected to experience an increase in delay of more than 0.6 seconds.

The intersection was analyzed assuming no traffic directly accessing the mine via the Birch Island Lost Creek Road as this route will only be used periodically when moving oversized loads. Development traffic at this intersection is generated from all mine traffic travelling from the South.

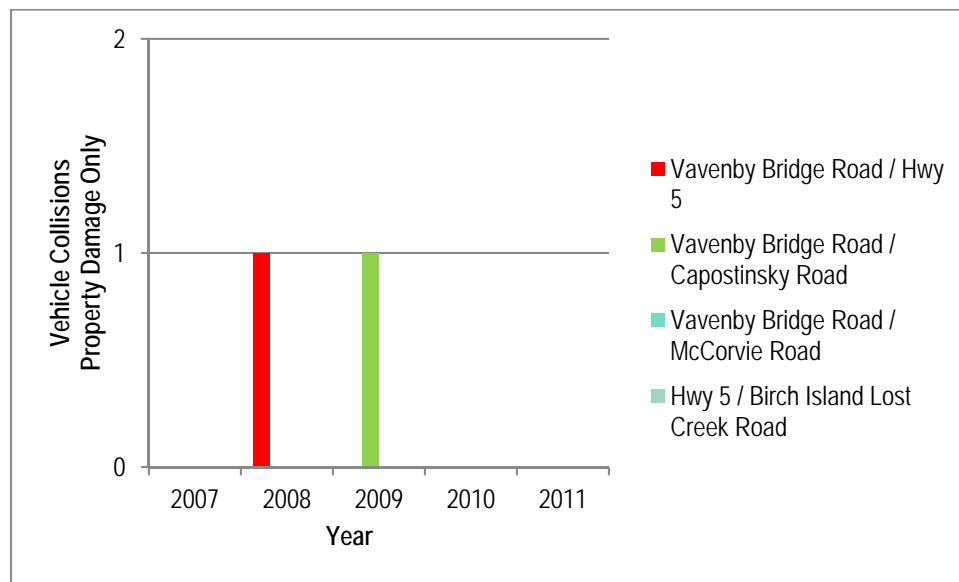
The intersection geometry is suitable to move oversized loads as there is a large gravel pad located to the north of the intersection that will allow over tracking. There were no identifiable concerns regarding using this intersection to move oversized vehicles with the caveat that all oversized loads are to be piloted off the highway.

# 5 SAFETY ANALYSIS

## 5.1 COLLISION STATISTICS

From data provided by ICBC, only the intersections of Hwy 5 /Vavenby Bridge Road and Vavenby Bridge Road / Capostinsky Road had any reportable incidents. Both incidents were property damage only (PDO) and there were no reported injuries or casualties. The incident at the Hwy 5 and Vavenby Bridge Road intersection occurred in 2008 and the incident at Vavenby Bridge Road and Capostinsky Road occurred in 2009. Incidents are shown in Figure 5-1.

*Figure 5-1 Property Damage Only Incidents on Mine Access Route*



## 5.2 VAVENBY BRIDGE APPROACHES

The approaches to the existing single lane Vavenby Bridge were examined to determine if there were any improvements that could be made to improve access and egress from the bridge.

### **Some highlights of this assessment are:**

- The West approach is on a slight down grade and has good sightlines across to the other side of the bridge. (Figure 5-3)
- The East approach is on a downgrade and has a sharp 90 degree corner onto the bridge. A short portion of the bridge is curved to help make vehicles make the corner. One of the guard rails on the inside corner of this curved segment has obvious damage from trucks rubbing against the rail. (Figure 5-4) Sight distances on this approach are good as the opposing side of the bridge is clearly visible.
- The bridge is used extensively by pedestrians and there is a designated pedestrian walkway across the bridge.
- Deck width is 4.35 metres (14' 4") between the wheel guards

### **Some recommendations are:**

- An assessment of the east approach should be performed to identify whether or not the yield location and road centreline could be adjusted to improve drivability. Additional brushing could also be undertaken to improve sightlines. Paint markings on the approaches should be done with an inlayed thermoplastic to prevent pavement marking creep.



*Figure 5-2 Vavenby Bridge - Looking North*



*Figure 5-3 Vavenby Bridge - Looking South*



*Figure 5-4 Vavenby Bridge - South Approach*



### 5.3 OPPORTUNITIES

As mine workers are anticipated to be working 12 hour shifts starting and ending at 6am and 6pm it is expected that some staff will car pool to and from Vavenby. Anecdotal evidence suggests that carpooling / car sharing could reduce the amount of on-highway traffic by 30% or more.

## 6 CONCLUSIONS AND RECOMMENDATIONS

### **The following conclusions have been drawn from this study:**

- During the peak of operations at the proposed Harper Creek project, a total of 332 new one-way trips per day are projected to be generated.
- Approximately two-thirds of this traffic will be light passenger vehicles generated by staff travelling to and from work after or before shift change. The remaining one-third of traffic is to support mine operations.
- A 100 vehicle parking lot will be constructed on the purchased Weyerhaeuser property. All mine staff will be bused from this site to the mine.
- All roads in the study area are projected to operate adequately through to 2045 with minimal increases in delay. It is anticipated that additional delay will be experienced during shift changes as approximately 140 staff will be required to travel to and from the parking lot facility located at the existing Weyerhaeuser Mill site.
- Concentrate deliveries will take place approximately once per hour with other deliveries taking place during the day.
- The project will not use KP Road and it will remain gated.
- Oversized vehicles will access the mine via the Birch Island Lost Creek Road.

### **Recommendations:**

- The south approach to the Vavenby Bridge should be assessed to determine whether changes to paint marking and signage could reduce the likelihood of logging and transport trucks from rubbing against the inside of the bridge rail. Other signage irregularities at the bridge should also be further examined. Additional brushing should be considered to improve sightlines.
- New project level information signage should be installed along the route to identify the route to the staff parking lot, office and mine.

- Signage improvements at intersection of Vavenby Bridge Road and Capostinsky Road. This includes installation of W-011 “Stop Sign Ahead” signage.
- A traffic management plan should be prepared for construction phase with emphasis on the use of the Birch Island Lost Creek Road for the transport of oversized and heavy loads. This study should be completed prior to mine construction.
- A bus service from Clearwater should be considered. Also, car sharing / carpooling should be encouraged. These programs could reduce traffic volumes by 30-50%.



## 7 CLOSURE

This report includes an assessment of the traffic impact on the road network in Vavenby BC as a result of the construction of the Harper Creek Project by Yellowhead Mining Inc.

This assessment has been prepared by McElhanney Consulting Services Ltd. for the benefit of Yellowhead Mining Inc. The information and data contained herein represent MCSL's best professional judgment in light of the knowledge and information available to MCSL at the time of preparation.

McElhanney Consulting Services Ltd. denies any liability whatsoever to other parties who may obtain access to this report for any injury, loss or damage suffered by such parties arising from their use of, or reliance upon, this document or any of its contents without the express written consent of MCSL and Yellowhead Mining Inc.

Yours truly,

### **McELHANNEY CONSULTING SERVICES LTD**

Prepared By:



Brendon Masson PEng  
Transportation Engineer

## APPENDIX A: TRAFFIC COUNT DATA



N/S Street: Caposkinsky Rd.

E/W Street: Vaverby Bridge Rd.

Observer: Cami Bolen

LOCATION: Intersection

DATE: 12-Sep-12

Notes: 0

Speed Limit Major Street: 0 0

Speed Limit Minor Street: 0 0

WEATHER: PC 5 Degrees

TOTAL HOURS = 11

TIME	North Approach			South Approach			East Approach			West Approach			Total	Hourly
	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	Volume	Volume
6:00 - 6:15	0	0	1	0	0	0	0	0	0	2	0	3	6	
6:15 - 6:30	0	0	2	0	0	0	0	0	0	1	0	0	3	
6:30 - 6:45	0	0	6	2	1	0	0	0	0	1	0	0	10	
6:45 - 7:00	0	0	0	2	0	0	0	0	0	0	0	0	2	21
7:00 - 7:15	0	0	1	2	0	0	0	0	0	3	0	1	7	22
7:15 - 7:30	0	0	4	0	0	0	0	0	0	2	0	0	6	25
7:30 - 7:45	0	0	0	0	0	0	0	0	0	4	0	0	4	19
7:45 - 8:00	1	0	1	1	0	0	0	0	0	6	0	0	9	26
8:00 - 8:15	0	0	5	0	0	0	0	0	0	3	0	0	8	27
8:15 - 8:30	0	0	2	1	0	0	0	0	0	6	0	3	12	33
8:30 - 8:45	0	0	3	3	0	0	0	0	1	0	1	0	8	37
8:45 - 9:00	0	1	4	0	0	0	0	0	0	0	1	0	6	34
SUB TOTAL	1	1	29	11	1	0	0	0	1	28	2	7	81	

Pedestrian			
N	S	E	W
0	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
	0	0	0
0	0	0	0

11:00 - 11:15	0	0	2	1	0	0	0	0	0	2	0	0	5	
11:15 - 11:30	0	0	7	2	0	0	0	0	0	0	1	2	12	
11:30 - 11:45	0	0	1	2	0	0	0	0	0	1	0	0	4	
11:45 - 12:00	0	0	2	3	0	0	0	2	2	0	1	2	12	33
12:00 - 12:15	0	0	6	1	0	1	0	2	0	10	3	0	23	51
12:15 - 12:30	0	0	2	0	0	0	0	2	1	7	1	1	14	53
12:30 - 12:45	0	0	6	1	0	0	0	2	0	5	5	1	20	69
12:45 - 13:00	0	0	3	1	0	0	0	0	0	0	0	1	5	62
SUB TOTAL	0	0	29	11	0	1	0	8	3	25	11	7	95	

	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
0	0	0	0	0

15:00 - 15:15	0	0	2	1	0	2	1	2	0	1	1	0	10	
15:15 - 15:30	0	0	3	4	0	0	0	7	0	2	5	2	23	
15:30 - 15:45	0	0	10	1	0	0	0	4	0	4	2	0	21	
15:45 - 16:00	0	0	4	1	0	0	0	4	0	2	2	0	13	67
16:00 - 16:15	0	0	4	3	0	0	0	3	0	2	0	0	12	69
16:15 - 16:30	0	0	1	0	0	0	0	0	0	0	0	0	1	47
16:30 - 16:45	0	0	4	0	0	0	0	0	0	3	0	2	9	35
16:45 - 17:00	0	0	3	2	0	0	0	0	0	2	0	1	8	30
17:00 - 17:15	0	0	3	2	0	0	0	0	0	0	0	0	5	23
17:15 - 17:30	0	0	6	1	0	0	0	0	0	0	1	1	9	31
17:30 - 17:45	0	0	1	0	0	0	0	0	0	4	0	1	6	28
17:45 - 18:00	0	0	4	0	0	0	0	0	0	1	0	0	5	25
SUB TOTAL	0	0	45	15	0	2	1	20	0	21	11	7	122	

	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	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	1	1	103	37	1	3	1	28	4	74	24	21	298	
AVGE VOL	0	0	9	3	0	0	0	3	0	7	2	2	27	

0	0	0	0	0
0	0	0	0	0

0 1 0.19 0.24 1 0 0 0.04 0 0.19 0 0.38

**Vehicle Turning Movement Survey**

**TOTAL**

N/S Street: McCorvy

Observer: Cami Bolen

E/W Street: Vaverby Bridge Rd.

Notes: 0

LOCATION: Intersection

Speed Limit Major Street:	0	0
Speed Limit Minor Street:	0	0

DATE: 12-Sep-12

WEATHER: PC 5 Degrees

TOTAL HOURS = 11

TIME	North Approach			South Approach			East Approach			West Approach			Total Volume	Hourly Volume
	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT		
6:00 - 6:15	0	3	0	1	0	3	1	0	0	2	1	7	18	
6:15 - 6:30	0	1	0	0	0	1	0	1	0	1	0	12	16	
6:30 - 6:45	1	0	0	3	0	2	4	1	1	4	1	8	25	
6:45 - 7:00	0	0	1	4	0	0	2	0	0	1	0	7	15	74
7:00 - 7:15	1	1	0	6	1	1	0	1	0	1	2	4	18	74
7:15 - 7:30	0	0	1	5	0	1	1	1	0	3	1	6	19	77
7:30 - 7:45	2	0	0	3	0	1	0	2	0	0	1	4	13	65
7:45 - 8:00	2	0	0	2	0	3	1	3	1	3	2	1	18	68
8:00 - 8:15	1	2	0	3	2	2	1	5	0	0	2	1	19	69
8:15 - 8:30	1	0	2	2	0	0	0	2	0	2	8	2	19	69
8:30 - 8:45	0	0	0	1	0	0	0	6	1	0	4	1	13	69
8:45 - 9:00	1	0	1	1	0	0	1	2	2	0	4	0	12	63
<b>SUB TOTAL</b>	<b>9</b>	<b>7</b>	<b>5</b>	<b>31</b>	<b>3</b>	<b>14</b>	<b>11</b>	<b>24</b>	<b>5</b>	<b>17</b>	<b>26</b>	<b>53</b>	<b>205</b>	

Pedestrian				
N	S	E	W	
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
1	1	0	1	
1	0	0	0	
1	1	0	0	
1	0	0	0	
1	0	0	0	
<b>5</b>	<b>2</b>	<b>0</b>	<b>1</b>	

11:00 - 11:15	4	0	1	3	3	1	1	3	0	3	0	7	26	
11:15 - 11:30	1	0	5	3	0	3	3	7	0	1	5	9	37	
11:30 - 11:45	0	0	1	0	0	2	3	0	1	0	0	5	12	
11:45 - 12:00	2	0	1	4	0	0	1	3	3	1	3	3	21	96
12:00 - 12:15	3	0	2	6	0	4	2	5	1	3	4	5	35	105
12:15 - 12:30	1	0	2	0	0	2	0	1	0	1	6	1	14	82
12:30 - 12:45	2	0	2	2	2	2	3	5	2	4	7	3	34	104
12:45 - 13:00	2	1	0	6	0	0	1	2	0	1	1	0	14	97
<b>SUB TOTAL</b>	<b>15</b>	<b>1</b>	<b>14</b>	<b>24</b>	<b>5</b>	<b>14</b>	<b>14</b>	<b>26</b>	<b>7</b>	<b>14</b>	<b>26</b>	<b>33</b>	<b>193</b>	

1	0	0	0	
0	0	0	0	
0	1	0	0	
0	0	0	0	
0	0	0	0	
0	0	0	0	
0	0	0	0	
0	1	0	0	
0	0	0	0	
<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>	

15:00 - 15:15	0	0	0	3	0	1	1	2	0	1	5	7	20	
15:15 - 15:30	0	1	3	8	0	2	1	10	1	3	7	10	46	
15:30 - 15:45	0	0	2	15	3	5	2	9	1	5	3	5	50	
15:45 - 16:00	3	1	8	12	1	3	2	8	0	1	5	12	56	172
16:00 - 16:15	4	1	3	15	0	2	1	6	3	3	0	3	41	193
16:15 - 16:30	0	0	1	6	1	1	0	2	0	0	0	3	14	161
16:30 - 16:45	2	0	1	3	1	0	1	1	1	1	4	2	17	128
16:45 - 17:00	1	0	1	5	1	2	0	4	0	1	1	2	18	90
17:00 - 17:15	1	0	3	2	1	1	0	2	2	2	1	0	15	64
17:15 - 17:30	2	0	0	3	0	1	0	5	3	2	4	5	25	75
17:30 - 17:45	2	0	4	4	0	2	2	1	2	1	1	1	20	78
17:45 - 18:00	1	0	1	2	0	0	0	6	0	2	3	5	20	80
<b>SUB TOTAL</b>	<b>16</b>	<b>3</b>	<b>27</b>	<b>78</b>	<b>8</b>	<b>20</b>	<b>10</b>	<b>56</b>	<b>13</b>	<b>22</b>	<b>34</b>	<b>55</b>	<b>342</b>	

0	2	0	0	
0	0	0	0	
0	0	0	0	
0	0	0	0	
0	3	0	0	
0	0	0	0	
0	0	0	0	
0	0	0	0	
0	0	0	0	
0	0	0	0	
0	0	0	0	
<b>0</b>	<b>5</b>	<b>0</b>	<b>0</b>	

<b>TOTAL</b>	<b>40</b>	<b>11</b>	<b>46</b>	<b>133</b>	<b>16</b>	<b>48</b>	<b>35</b>	<b>106</b>	<b>25</b>	<b>53</b>	<b>86</b>	<b>141</b>	<b>740</b>	
<b>AVGE VOL</b>	<b>4</b>	<b>1</b>	<b>4</b>	<b>12</b>	<b>1</b>	<b>4</b>	<b>3</b>	<b>10</b>	<b>2</b>	<b>5</b>	<b>8</b>	<b>13</b>	<b>67</b>	

<b>6</b>	<b>9</b>	<b>0</b>	<b>1</b>	
<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	



## Vehicle Turning Movement Survey

## TOTAL

N/S Street: Highway 5

Observer: Cami Bolen

E/W Street: Birch Isl - Creek Cr.

Notes: 0

LOCATION: Intersection

Speed Limit Major Street:	0	0
Speed Limit Minor Street:	0	0

DATE: 13-Sep-12

WEATHER: PC 5 Degrees

TOTAL HOURS = 11

TIME	North Approach			South Approach			East Approach			West Approach			Total	Hourly
	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	LEFT	THRU	RIGHT	Volume	Volume
6:00 - 6:15	0	8	0	0	23	1	0	0	0	0	0	0	32	
6:15 - 6:30	0	5	0	0	11	1	0	0	0	0	0	0	17	
6:30 - 6:45	0	15	0	0	26	0	1	0	1	0	0	0	43	
6:45 - 7:00	0	12	0	0	17	0	0	0	0	0	0	0	29	121
7:00 - 7:15	0	19	0	1	17	0	0	0	0	0	0	0	37	126
7:15 - 7:30	0	14	0	0	17	0	2	0	0	0	0	0	33	142
7:30 - 7:45	1	16	0	0	19	0	0	0	0	0	0	0	36	135
7:45 - 8:00	0	16	0	0	13	0	2	0	0	0	0	0	31	137
8:00 - 8:15	0	15	0	0	27	0	1	0	2	0	0	0	45	145
8:15 - 8:30	4	16	0	0	9	0	2	0	0	0	0	0	31	143
8:30 - 8:45	2	20	0	0	28	0	3	0	3	0	0	0	56	163
8:45 - 9:00	0	7	0	0	18	0	0	0	0	0	0	0	25	157
<b>SUB TOTAL</b>	<b>7</b>	<b>163</b>	<b>0</b>	<b>1</b>	<b>225</b>	<b>2</b>	<b>11</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>415</b>	

Pedestrian				
N	S	E	W	
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

11:00 - 11:15	0	32	0	0	40	0	1	0	0	0	0	0	73	
11:15 - 11:30	1	26	0	0	43	0	1	0	0	0	0	0	71	
11:30 - 11:45	1	38	0	0	33	2	0	0	0	0	0	0	74	
11:45 - 12:00	1	34	0	0	22	2	5	0	0	0	0	0	64	282
12:00 - 12:15	0	25	0	0	32	3	2	0	2	0	0	0	64	273
12:15 - 12:30	1	10	0	0	36	0	2	0	1	0	0	0	50	252
12:30 - 12:45	1	31	0	0	29	4	1	0	1	0	0	0	67	245
12:45 - 13:00	0	38	0	0	50	0	1	0	1	0	0	0	90	271
<b>SUB TOTAL</b>	<b>5</b>	<b>234</b>	<b>0</b>	<b>0</b>	<b>285</b>	<b>11</b>	<b>13</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>553</b>	

0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

15:00 - 15:15	0	36	0	0	17	2	3	0	2	0	0	0	60	
15:15 - 15:30	2	27	0	0	30	2	2	0	3	0	0	0	66	
15:30 - 15:45	2	43	0	0	31	2	1	0	2	0	0	0	81	
15:45 - 16:00	2	53	0	0	25	0	2	0	4	0	0	0	86	293
16:00 - 16:15	1	46	0	0	20	2	1	0	1	0	0	0	71	304
16:15 - 16:30	1	50	0	0	16	0	1	0	2	0	0	0	70	308
16:30 - 16:45	3	46	0	0	22	1	4	0	1	0	0	0	77	304
16:45 - 17:00	4	45	0	0	24	0	4	0	0	0	0	0	77	295
17:00 - 17:15	4	43	0	0	25	0	1	0	1	0	0	0	74	298
17:15 - 17:30	1	39	0	0	20	1	2	0	1	0	0	0	64	292
17:30 - 17:45	3	4	0	0	25	1	4	0	0	0	0	0	37	252
17:45 - 18:00	0	33	0	0	21	3	2	0	0	0	0	0	59	234
<b>SUB TOTAL</b>	<b>23</b>	<b>465</b>	<b>0</b>	<b>0</b>	<b>276</b>	<b>14</b>	<b>27</b>	<b>0</b>	<b>17</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>822</b>	

0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

<b>TOTAL</b>	<b>35</b>	<b>862</b>	<b>0</b>	<b>1</b>	<b>786</b>	<b>27</b>	<b>51</b>	<b>0</b>	<b>28</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1790</b>	
<b>AVGE VOL</b>	<b>3</b>	<b>78</b>	<b>0</b>	<b>0</b>	<b>71</b>	<b>2</b>	<b>5</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>163</b>	

0	0	0	0	0
0	0	0	0	0



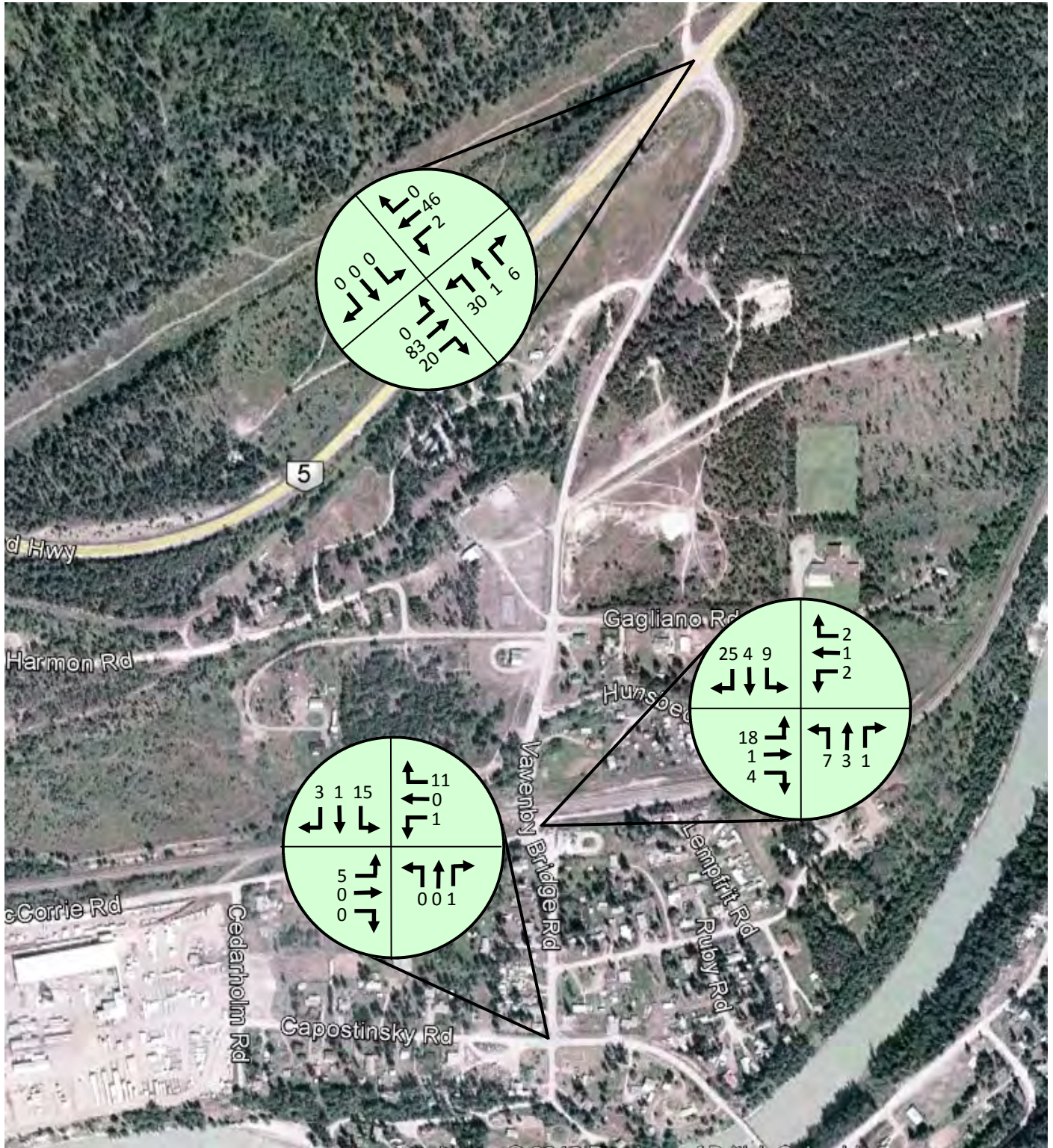


Figure 1: 2012 Background AM Traffic Volumes



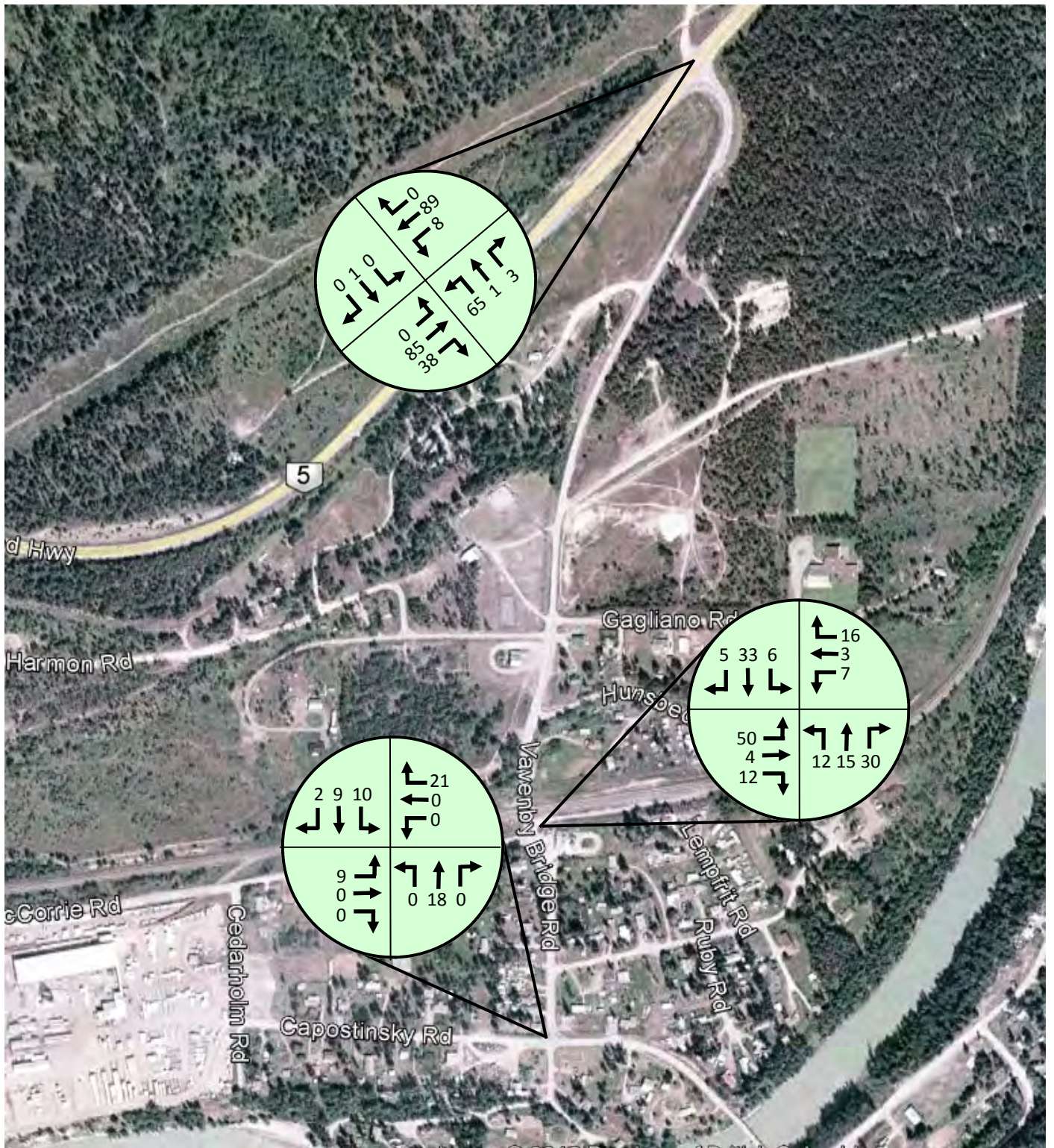


Figure 2: 2012 Background PM Traffic Volumes



## APPENDIX B: INTERSECTION ANALYSIS

# HCM Unsignalized Intersection Capacity Analysis

## 3: Hwy 5 & KP Road

02/11/2012























Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Volume (veh/h)	82	0	0	73	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	105	0	0	94	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			105		199	105
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			105		199	105
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1486		790	949
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	105	94	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1486	1700			
Volume to Capacity	0.06	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS				A		
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS				A		
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			7.6%	ICU Level of Service	A	
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 9: VBR & hwy 5

















02/11/2012

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	0	0	30	1	6	0	83	20	2	46	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	0	0	0	38	1	8	0	106	26	3	59	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)						4						
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	171	171	59	171	171	106	59			106		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	171	171	59	171	171	106	59			106		
tC, single (s)	7.2	6.6	6.3	7.4	6.8	6.5	4.2			4.4		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.7	4.2	3.6	2.3			2.5		
p0 queue free %	100	100	100	95	100	99	100			100		
cM capacity (veh/h)	766	707	985	741	682	879	1495			1302		
Direction, Lane #	SE 1	NW 1	NE 1	NE 2	NE 3	SW 1	SW 2					
Volume Total	0	47	0	106	26	3	59					
Volume Left	0	38	0	0	0	3	0					
Volume Right	0	8	0	0	26	0	0					
cSH	1700	882	1700	1700	1700	1302	1700					
Volume to Capacity	0.00	0.05	0.00	0.06	0.02	0.00	0.03					
Queue Length 95th (m)	0.0	1.4	0.0	0.0	0.0	0.0	0.0					
Control Delay (s)	0.0	10.0	0.0	0.0	0.0	7.8	0.0					
Lane LOS	A	A				A						
Approach Delay (s)	0.0	10.0	0.0			0.3						
Approach LOS	A	A										
Intersection Summary												
Average Delay			2.0									
Intersection Capacity Utilization		14.4%		ICU Level of Service	A							
Analysis Period (min)		15										

# HCM Unsignalized Intersection Capacity Analysis

## 13: McCorvie Rd & 9

















02/11/2012

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	18	1	4	2	1	2	7	3	1	9	4	25
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	23	1	5	3	1	3	9	4	1	12	5	32
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	70	67	21	72	83	4	37			5		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	70	67	21	72	83	4	37			5		
tC, single (s)	7.2	6.7	6.5	7.4	6.6	6.3	4.5			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.2	3.6	3.7	4.1	3.4	2.6			2.3		
p0 queue free %	97	100	99	100	100	100	99			99		
cM capacity (veh/h)	883	784	978	848	776	1062	1360			1565		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	29	6	14	49								
Volume Left	23	3	9	12								
Volume Right	5	3	1	32								
cSH	893	904	1360	1565								
Volume to Capacity	0.03	0.01	0.01	0.01								
Queue Length 95th (m)	0.8	0.2	0.2	0.2								
Control Delay (s)	9.2	9.0	4.9	1.8								
Lane LOS	A	A	A	A								
Approach Delay (s)	9.2	9.0	4.9	1.8								
Approach LOS	A	A										
<b>Intersection Summary</b>												
Average Delay			4.9									
Intersection Capacity Utilization			13.3%		ICU Level of Service					A		
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 17: VBR &

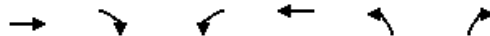
02/11/2012

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	0	0	1	0	11	0	0	1	15	1	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	6	0	0	1	0	14	0	0	1	19	1	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	14			0			27	29	0	24	22	7
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	14			0			27	29	0	24	22	7
tC, single (s)	4.3			4.1			7.1	6.5	6.2	7.3	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.0	3.3	3.7	4.0	3.4
p0 queue free %	100			100			100	100	100	98	100	100
cM capacity (veh/h)	1472			1636			980	855	1091	941	861	1044
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	6	15	1	24								
Volume Left	6	1	0	19								
Volume Right	0	14	1	4								
cSH	1472	1636	1091	951								
Volume to Capacity	0.00	0.00	0.00	0.03								
Queue Length 95th (m)	0.1	0.0	0.0	0.6								
Control Delay (s)	7.5	0.6	8.3	8.9								
Lane LOS	A	A	A	A								
Approach Delay (s)	7.5	0.6	8.3	8.9								
Approach LOS			A	A								
<b>Intersection Summary</b>												
Average Delay			6.0									
Intersection Capacity Utilization			17.7%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 27: Hwy 5 & BILC Road

02/11/2012



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩			↩	↩	
Volume (veh/h)	77	0	6	67	8	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	99	0	8	86	10	6
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			99		200	99
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			99		200	99
tC, single (s)			4.3		6.4	6.4
tC, 2 stage (s)						
tF (s)			2.4		3.5	3.5
p0 queue free %			99		99	99
cM capacity (veh/h)			1405		778	918
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	99	94	17			
Volume Left	0	8	10			
Volume Right	0	0	6			
cSH	1700	1405	826			
Volume to Capacity	0.06	0.01	0.02			
Queue Length 95th (m)	0.0	0.1	0.5			
Control Delay (s)	0.0	0.7	9.4			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.7	9.4			
Approach LOS			A			
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			18.5%	ICU Level of Service	A	
Analysis Period (min)			15			



# HCM Unsignalized Intersection Capacity Analysis

## 3: Hwy 5 & KP Road

02/11/2012

























Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻	↻	
Volume (veh/h)	101	0	0	198	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.78	0.78	0.78	0.83	0.78	0.78
Hourly flow rate (vph)	129	0	0	239	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			129		368	129
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			129		368	129
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1456		632	920
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	129	239	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1456	1700			
Volume to Capacity	0.08	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS				A		
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS				A		
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			13.8%	ICU Level of Service	A	
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

















## 9: VBR & hwy 5

02/11/2012

													
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR	
Lane Configurations													
Volume (veh/h)	0	1	0	65	1	3	0	85	38	8	89	0	
Sign Control		Stop			Stop			Free			Free		
Grade		0%			0%			0%			0%		
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	
Hourly flow rate (vph)	0	1	0	83	1	4	0	109	49	10	114	0	
Pedestrians													
Lane Width (m)													
Walking Speed (m/s)													
Percent Blockage													
Right turn flare (veh)						4							
Median type								None			None		
Median storage (veh)													
Upstream signal (m)													
pX, platoon unblocked													
vC, conflicting volume	244	244	114	244	244	109	114			109			
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	244	244	114	244	244	109	114			109			
tC, single (s)	7.2	6.6	6.3	7.4	6.8	6.5	4.2			4.4			
tC, 2 stage (s)													
tF (s)	3.6	4.1	3.4	3.7	4.2	3.6	2.3			2.5			
p0 queue free %	100	100	100	87	100	100	100			99			
cM capacity (veh/h)	685	640	917	657	616	876	1427			1299			
Direction, Lane #	SE 1	NW 1	NE 1	NE 2	NE 3	SW 1	SW 2						
Volume Total	1	88	0	109	49	10	114						
Volume Left	0	83	0	0	0	10	0						
Volume Right	0	4	0	0	49	0	0						
cSH	640	687	1700	1700	1700	1299	1700						
Volume to Capacity	0.00	0.13	0.00	0.06	0.03	0.01	0.07						
Queue Length 95th (m)	0.0	3.5	0.0	0.0	0.0	0.2	0.0						
Control Delay (s)	10.6	11.2	0.0	0.0	0.0	7.8	0.0						
Lane LOS	B	B				A							
Approach Delay (s)	10.6	11.2	0.0			0.6							
Approach LOS	B	B											
<b>Intersection Summary</b>													
Average Delay			2.9										
Intersection Capacity Utilization			23.6%		ICU Level of Service					A			
Analysis Period (min)			15										

HCM Unsignalized Intersection Capacity Analysis  
 13: McCorvie Rd &













02/11/2012

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Volume (veh/h)	50	4	12	7	3	16	12	15	30	5	33	6	
Sign Control		Stop			Stop			Free			Free		
Grade		0%			0%			0%			0%		
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	
Hourly flow rate (vph)	64	5	15	9	4	21	15	19	38	6	42	8	
Pedestrians													
Lane Width (m)													
Walking Speed (m/s)													
Percent Blockage													
Right turn flare (veh)													
Median type							None						
Median storage (veh)													
Upstream signal (m)													
pX, platoon unblocked													
vC, conflicting volume	151	147	46	146	132	38	50					58	
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	151	147	46	146	132	38	50					58	
tC, single (s)	7.2	6.7	6.5	7.4	6.6	6.3	4.5					4.2	
tC, 2 stage (s)													
tF (s)	3.6	4.2	3.6	3.7	4.1	3.4	2.6					2.3	
p0 queue free %	92	99	98	99	99	98	99					100	
cM capacity (veh/h)	764	706	947	745	727	1016	1345					1497	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	85	33	73	56									
Volume Left	64	9	15	6									
Volume Right	15	21	38	8									
cSH	788	888	1345	1497									
Volume to Capacity	0.11	0.04	0.01	0.00									
Queue Length 95th (m)	2.9	0.9	0.3	0.1									
Control Delay (s)	10.1	9.2	1.7	0.9									
Lane LOS	B	A	A	A									
Approach Delay (s)	10.1	9.2	1.7	0.9									
Approach LOS	B	A											
<b>Intersection Summary</b>													
Average Delay			5.4										
Intersection Capacity Utilization			21.1%	ICU Level of Service	A								
Analysis Period (min)			15										

# HCM Unsignalized Intersection Capacity Analysis

## 17: VBR &

02/11/2012

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	9	0	0	0	0	21	0	18	0	10	9	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	12	0	0	0	0	27	0	23	0	13	12	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	27			0			45	50	0	48	37	13
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	27			0			45	50	0	48	37	13
tC, single (s)	4.3			4.1			7.1	6.5	6.2	7.3	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.0	3.3	3.7	4.0	3.4
p0 queue free %	99			100			100	97	100	99	99	100
cM capacity (veh/h)	1456			1636			944	831	1091	887	843	1035
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	12	27	23	27								
Volume Left	12	0	0	13								
Volume Right	0	27	0	3								
cSH	1456	1636	831	879								
Volume to Capacity	0.01	0.00	0.03	0.03								
Queue Length 95th (m)	0.2	0.0	0.7	0.8								
Control Delay (s)	7.5	0.0	9.5	9.2								
Lane LOS	A		A	A								
Approach Delay (s)	7.5	0.0	9.5	9.2								
Approach LOS			A	A								
<b>Intersection Summary</b>												
Average Delay			6.3									
Intersection Capacity Utilization			21.6%		ICU Level of Service					A		
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

22: Int

02/11/2012



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Volume (veh/h)	0	0	0	0	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			0		0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		0	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1623		1023	1085
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	0	0	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS				A		
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS				A		
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			0.0%	ICU Level of Service	A	
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 27: Hwy 5 & BILC Road

02/11/2012



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Volume (veh/h)	92	4	6	192	5	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.78	0.78	0.78	0.83	0.78	0.78
Hourly flow rate (vph)	118	5	8	231	6	12
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			123		367	121
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			123		367	121
tC, single (s)			4.3		6.4	6.4
tC, 2 stage (s)						
tF (s)			2.4		3.5	3.5
p0 queue free %			99		99	99
cM capacity (veh/h)			1376		623	892
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	123	239	18			
Volume Left	0	8	6			
Volume Right	5	0	12			
cSH	1700	1376	773			
Volume to Capacity	0.07	0.01	0.02			
Queue Length 95th (m)	0.0	0.1	0.6			
Control Delay (s)	0.0	0.3	9.8			
Lane LOS		A	A			
Approach Delay (s)	0.0	0.3	9.8			
Approach LOS			A			
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization		24.9%		ICU Level of Service	A	
Analysis Period (min)		15				



# HCM Unsignalized Intersection Capacity Analysis

## 3: KP Road & Hwy 5

5/30/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Volume (veh/h)	118	0	0	104	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	142	0	0	133	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			142		276	142
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			142		276	142
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1441		714	906






















Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	142	133	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1441	1700
Volume to Capacity	0.08	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		9.5%	ICU Level of Service A
Analysis Period (min)		15	

# HCM Unsignalized Intersection Capacity Analysis

## 9: Hwy 5 & VBR

















5/30/2014

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	0	0	35	1	7	0	134	23	2	74	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.83	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	0	0	0	45	1	9	0	161	29	3	95	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)						4						
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	262	261	95	261	261	161	95			161		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	262	261	95	261	261	161	95			161		
tC, single (s)	7.2	6.6	6.3	7.4	6.8	6.5	4.2			4.4		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.7	4.2	3.6	2.3			2.5		
p0 queue free %	100	100	100	93	100	99	100			100		
cM capacity (veh/h)	665	629	940	644	605	818	1450			1240		
Direction, Lane #	SE 1	NW 1	NE 1	NE 2	NE 3	SW 1	SW 2					
Volume Total	0	55	0	161	29	3	95					
Volume Left	0	45	0	0	0	3	0					
Volume Right	0	9	0	0	29	0	0					
cSH	1700	768	1700	1700	1700	1240	1700					
Volume to Capacity	0.00	0.07	0.00	0.09	0.02	0.00	0.06					
Queue Length 95th (m)	0.0	1.9	0.0	0.0	0.0	0.0	0.0					
Control Delay (s)	0.0	10.8	0.0	0.0	0.0	7.9	0.0					
Lane LOS	A	B				A						
Approach Delay (s)	0.0	10.8	0.0			0.2						
Approach LOS	A	B										
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization			17.1%	ICU Level of Service	A							
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 13: VBR & McCorvie Rd

5/30/2014

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Volume (veh/h)	20	1	4	2	1	2	8	3	1	10	4	28	
Sign Control		Stop			Stop			Free			Free		
Grade		0%			0%			0%			0%		
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	
Hourly flow rate (vph)	26	1	5	3	1	3	10	4	1	13	5	36	
Pedestrians													
Lane Width (m)													
Walking Speed (m/s)													
Percent Blockage													
Right turn flare (veh)													
Median type							None						
Median storage (veh)													
Upstream signal (m)													
pX, platoon unblocked													
vC, conflicting volume	77	74	23	79	92	4	41						5
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	77	74	23	79	92	4	41						5
tC, single (s)	7.2	6.7	6.5	7.4	6.6	6.3	4.5						4.2
tC, 2 stage (s)													
tF (s)	3.6	4.2	3.6	3.7	4.1	3.4	2.6						2.3
p0 queue free %	97	100	99	100	100	100	99						99
cM capacity (veh/h)	872	776	976	838	766	1062	1356						1565
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>									
Volume Total	32	6	15	54									
Volume Left	26	3	10	13									
Volume Right	5	3	1	36									
cSH	883	897	1356	1565									
Volume to Capacity	0.04	0.01	0.01	0.01									
Queue Length 95th (m)	0.9	0.2	0.2	0.2									
Control Delay (s)	9.2	9.0	5.1	1.8									
Lane LOS	A	A	A	A									
Approach Delay (s)	9.2	9.0	5.1	1.8									
Approach LOS	A	A											
<b>Intersection Summary</b>													
Average Delay			4.9										
Intersection Capacity Utilization			13.3%	ICU Level of Service	A								
Analysis Period (min)			15										

# HCM Unsignalized Intersection Capacity Analysis

## 17: VBR

5/30/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	6	0	0	1	0	12	0	0	1	17	1	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	8	0	0	1	0	15	0	0	1	22	1	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	15			0			30	33	0	27	26	8
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	15			0			30	33	0	27	26	8
tC, single (s)	4.3			4.1			7.1	6.5	6.2	7.3	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.0	3.3	3.7	4.0	3.4
p0 queue free %	99			100			100	100	100	98	100	100
cM capacity (veh/h)	1470			1636			974	850	1091	936	857	1043

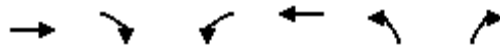
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	8	17	1	27
Volume Left	8	1	0	22
Volume Right	0	15	1	4
cSH	1470	1636	1091	946
Volume to Capacity	0.01	0.00	0.00	0.03
Queue Length 95th (m)	0.1	0.0	0.0	0.7
Control Delay (s)	7.5	0.6	8.3	8.9
Lane LOS	A	A	A	A
Approach Delay (s)	7.5	0.6	8.3	8.9
Approach LOS			A	A

Intersection Summary			
Average Delay		6.0	
Intersection Capacity Utilization	17.8%		ICU Level of Service
Analysis Period (min)		15	A

# HCM Unsignalized Intersection Capacity Analysis

22:

5/30/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	↘
Volume (veh/h)	0	0	0	0	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0			0	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0			0	0	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %						
cM capacity (veh/h)	1623			1023	1085	

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	0	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		

# HCM Unsignalized Intersection Capacity Analysis

## 27: BILC Road & Hwy 5

5/30/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	112	0	6	98	8	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	144	0	8	126	10	6
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			144	285		144
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			144	285		144
tC, single (s)			4.3	6.4		6.4
tC, 2 stage (s)						
tF (s)			2.4	3.5		3.5
p0 queue free %						
		99		99		99
cM capacity (veh/h)						
			1352	695		866

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	144	133	17
Volume Left	0	8	10
Volume Right	0	0	6
cSH	1700	1352	752
Volume to Capacity	0.08	0.01	0.02
Queue Length 95th (m)	0.0	0.1	0.5
Control Delay (s)	0.0	0.5	9.9
Lane LOS	A		A
Approach Delay (s)	0.0	0.5	9.9
Approach LOS	A		

Intersection Summary			
Average Delay			0.8
Intersection Capacity Utilization	20.1%	ICU Level of Service	A
Analysis Period (min)			15



# HCM Unsignalized Intersection Capacity Analysis

## 3: KP Road & Hwy 5

5/30/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	→
Volume (veh/h)	144	0	0	286	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.78	0.78	0.87	0.78	0.78
Hourly flow rate (vph)	173	0	0	329	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			173		502	173
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			173		502	173
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1403		529	870






















Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	173	329	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1403	1700
Volume to Capacity	0.10	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		18.4%	ICU Level of Service A
Analysis Period (min)		15	

# HCM Unsignalized Intersection Capacity Analysis

## 9: Hwy 5 & VBR

















5/30/2014

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	1	0	75	1	3	0	137	44	9	143	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.83	0.78	0.78	0.83	0.78
Hourly flow rate (vph)	0	1	0	96	1	4	0	165	56	12	172	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)						4						
Median type								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	361	360	172	361	360	165	172			165		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	361	360	172	361	360	165	172			165		
tC, single (s)	7.2	6.6	6.3	7.4	6.8	6.5	4.2			4.4		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.7	4.2	3.6	2.3			2.5		
p0 queue free %	100	100	100	82	100	100	100			99		
cM capacity (veh/h)	572	549	851	548	527	814	1358			1236		
Direction, Lane #	SE 1	NW 1	NE 1	NE 2	NE 3	SW 1	SW 2					
Volume Total	1	101	0	165	56	12	172					
Volume Left	0	96	0	0	0	12	0					
Volume Right	0	4	0	0	56	0	0					
cSH	549	569	1700	1700	1700	1236	1700					
Volume to Capacity	0.00	0.18	0.00	0.10	0.03	0.01	0.10					
Queue Length 95th (m)	0.1	5.1	0.0	0.0	0.0	0.2	0.0					
Control Delay (s)	11.6	12.9	0.0	0.0	0.0	7.9	0.0					
Lane LOS	B	B				A						
Approach Delay (s)	11.6	12.9	0.0			0.5						
Approach LOS	B	B										
Intersection Summary												
Average Delay			2.8									
Intersection Capacity Utilization			25.1%	ICU Level of Service	A							
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 13: VBR & McCorvie Rd

5/30/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	56	4	13	8	3	18	13	17	34	7	37	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	72	5	17	10	4	23	17	22	44	9	47	8
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	171	168	51	165	150	44	55			65		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	171	168	51	165	150	44	55			65		
tC, single (s)	7.2	6.7	6.5	7.4	6.6	6.3	4.5			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.2	3.6	3.7	4.1	3.4	2.6			2.3		
p0 queue free %	90	99	98	99	99	98	99			99		
cM capacity (veh/h)	737	686	940	720	709	1010	1339			1487		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	94	37	82	64								
Volume Left	72	10	17	9								
Volume Right	17	23	44	8								
cSH	763	874	1339	1487								
Volume to Capacity	0.12	0.04	0.01	0.01								
Queue Length 95th (m)	3.3	1.1	0.3	0.1								
Control Delay (s)	10.4	9.3	1.6	1.1								
Lane LOS	B	A	A	A								
Approach Delay (s)	10.4	9.3	1.6	1.1								
Approach LOS	B	A										
<b>Intersection Summary</b>												
Average Delay			5.5									
Intersection Capacity Utilization			22.1%		ICU Level of Service					A		
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 17: VBR

5/30/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	10	0	0	0	0	23	0	20	0	11	10	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	13	0	0	0	0	29	0	26	0	14	13	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	29			0			49	55	0	53	40	15
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	29			0			49	55	0	53	40	15
tC, single (s)	4.3			4.1			7.1	6.5	6.2	7.3	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.0	3.3	3.7	4.0	3.4
p0 queue free %	99			100			100	97	100	98	98	100
cM capacity (veh/h)	1452			1636			936	825	1091	877	838	1034

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	29	26	29
Volume Left	13	0	0	14
Volume Right	0	29	0	3
cSH	1452	1636	825	871
Volume to Capacity	0.01	0.00	0.03	0.03
Queue Length 95th (m)	0.2	0.0	0.8	0.8
Control Delay (s)	7.5	0.0	9.5	9.3
Lane LOS	A		A	A
Approach Delay (s)	7.5	0.0	9.5	9.3
Approach LOS			A	A

Intersection Summary			
Average Delay		6.3	
Intersection Capacity Utilization	21.8%		ICU Level of Service
Analysis Period (min)		15	A

# HCM Unsignalized Intersection Capacity Analysis

## 27: BILC Road & Hwy 5

5/30/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↘	↙
Volume (veh/h)	134	4	6	280	5	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.78	0.78	0.87	0.78	0.78
Hourly flow rate (vph)	161	5	8	322	6	12
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			167		501	164
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			167		501	164
tC, single (s)			4.3		6.4	6.4
tC, 2 stage (s)						
tF (s)			2.4		3.5	3.5
p0 queue free %			99		99	99
cM capacity (veh/h)			1325		521	843

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	167	330	18
Volume Left	0	8	6
Volume Right	5	0	12
cSH	1700	1325	691
Volume to Capacity	0.10	0.01	0.03
Queue Length 95th (m)	0.0	0.1	0.6
Control Delay (s)	0.0	0.2	10.4
Lane LOS		A	B
Approach Delay (s)	0.0	0.2	10.4
Approach LOS			B

Intersection Summary			
Average Delay		0.5	
Intersection Capacity Utilization	29.6%		ICU Level of Service A
Analysis Period (min)		15	

# HCM Unsignalized Intersection Capacity Analysis

## 3: KP Road & Hwy 5

5/30/2014
























Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	→
Volume (veh/h)	145	0	0	122	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.78	0.78	0.83	0.78	0.78
Hourly flow rate (vph)	175	0	0	147	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			175		322	175
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			175		322	175
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1402		672	869
<b>Direction, Lane #</b>						
	EB 1	WB 1	NB 1			
Volume Total	175	147	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1402	1700			
Volume to Capacity	0.10	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS			A			
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			11.0%	ICU Level of Service		A
Analysis Period (min)			15			



# HCM Unsignalized Intersection Capacity Analysis

## 9: Hwy 5 & VBR

















5/30/2014

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	0	0	43	1	9	0	165	28	3	91	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.83	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	0	0	0	55	1	12	0	199	36	4	117	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)						4						
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	324	323	117	323	323	199	117			199		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	324	323	117	323	323	199	117			199		
tC, single (s)	7.2	6.6	6.3	7.4	6.8	6.5	4.2			4.4		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.7	4.2	3.6	2.3			2.5		
p0 queue free %	100	100	100	91	100	99	100			100		
cM capacity (veh/h)	602	580	914	585	557	778	1424			1199		
<b>Direction, Lane #</b>	<b>SE 1</b>	<b>NW 1</b>	<b>NE 1</b>	<b>NE 2</b>	<b>NE 3</b>	<b>SW 1</b>	<b>SW 2</b>					
Volume Total	0	68	0	199	36	4	117					
Volume Left	0	55	0	0	0	4	0					
Volume Right	0	12	0	0	36	0	0					
cSH	1700	703	1700	1700	1700	1199	1700					
Volume to Capacity	0.00	0.10	0.00	0.12	0.02	0.00	0.07					
Queue Length 95th (m)	0.0	2.6	0.0	0.0	0.0	0.1	0.0					
Control Delay (s)	0.0	11.5	0.0	0.0	0.0	8.0	0.0					
Lane LOS	A	B				A						
Approach Delay (s)	0.0	11.5	0.0			0.3						
Approach LOS	A	B										
<b>Intersection Summary</b>												
Average Delay			1.9									
Intersection Capacity Utilization			18.7%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 13: VBR & McCorvie Rd

















5/30/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	25	1	6	3	1	3	10	4	1	12	6	34
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	32	1	8	4	1	4	13	5	1	15	8	44
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	96	92	29	100	113	6	51			6		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	96	92	29	100	113	6	51			6		
tC, single (s)	7.2	6.7	6.5	7.4	6.6	6.3	4.5			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.2	3.6	3.7	4.1	3.4	2.6			2.3		
p0 queue free %	96	100	99	100	100	100	99			99		
cM capacity (veh/h)	844	755	968	808	742	1060	1343			1564		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	41	9	19	67								
Volume Left	32	4	13	15								
Volume Right	8	4	1	44								
cSH	861	887	1343	1564								
Volume to Capacity	0.05	0.01	0.01	0.01								
Queue Length 95th (m)	1.2	0.2	0.2	0.2								
Control Delay (s)	9.4	9.1	5.2	1.7								
Lane LOS	A	A	A	A								
Approach Delay (s)	9.4	9.1	5.2	1.7								
Approach LOS	A	A										
<b>Intersection Summary</b>												
Average Delay			5.0									
Intersection Capacity Utilization			13.3%		ICU Level of Service					A		
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 17: VBR

5/30/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	7	0	0	1	0	15	0	0	1	21	1	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	9	0	0	1	0	19	0	0	1	27	1	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	19			0			36	40	0	31	30	10
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	19			0			36	40	0	31	30	10
tC, single (s)	4.3			4.1			7.1	6.5	6.2	7.3	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.0	3.3	3.7	4.0	3.4
p0 queue free %	99			100			100	100	100	97	100	100
cM capacity (veh/h)	1465			1636			964	843	1091	929	851	1041
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	9	21	1	33								
Volume Left	9	1	0	27								
Volume Right	0	19	1	5								
cSH	1465	1636	1091	941								
Volume to Capacity	0.01	0.00	0.00	0.04								
Queue Length 95th (m)	0.1	0.0	0.0	0.9								
Control Delay (s)	7.5	0.5	8.3	9.0								
Lane LOS	A	A	A	A								
Approach Delay (s)	7.5	0.5	8.3	9.0								
Approach LOS			A	A								
<b>Intersection Summary</b>												
Average Delay			6.0									
Intersection Capacity Utilization			18.1%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 27: BILC Road & Hwy 5

5/30/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻	↻	
Volume (veh/h)	138	0	8	120	10	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.78	0.78	0.83	0.78	0.78
Hourly flow rate (vph)	166	0	10	145	13	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			166		331	166
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			166		331	166
tC, single (s)			4.3		6.4	6.4
tC, 2 stage (s)						
tF (s)			2.4		3.5	3.5
p0 queue free %			99		98	99
cM capacity (veh/h)			1326		652	840

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	166	155	21
Volume Left	0	10	13
Volume Right	0	0	8
cSH	1700	1326	712
Volume to Capacity	0.10	0.01	0.03
Queue Length 95th (m)	0.0	0.2	0.7
Control Delay (s)	0.0	0.6	10.2
Lane LOS		A	B
Approach Delay (s)	0.0	0.6	10.2
Approach LOS			B

Intersection Summary			
Average Delay		0.9	
Intersection Capacity Utilization		22.9%	ICU Level of Service A
Analysis Period (min)		15	

# HCM Unsignalized Intersection Capacity Analysis

## 3: KP Road & Hwy 5

5/30/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	177	0	0	353	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.78	0.78	0.87	0.78	0.78
Hourly flow rate (vph)	213	0	0	406	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			213		619	213
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			213		619	213
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %						
				100	100	100
cM capacity (veh/h)			1357		452	827






















Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	213	406	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1357	1700
Volume to Capacity	0.13	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	21.9%	ICU Level of Service	A
Analysis Period (min)	15		

# HCM Unsignalized Intersection Capacity Analysis

## 9: Hwy 5 & VBR

5/30/2014

















												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	1	0	93	1	4	0	169	54	11	177	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.83	0.78	0.78	0.83	0.78
Hourly flow rate (vph)	0	1	0	119	1	5	0	204	69	14	213	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)						4						
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	446	445	213	446	445	204	213			204		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	446	445	213	446	445	204	213			204		
tC, single (s)	7.2	6.6	6.3	7.4	6.8	6.5	4.2			4.4		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.7	4.2	3.6	2.3			2.5		
p0 queue free %	100	100	100	75	100	99	100			99		
cM capacity (veh/h)	500	490	807	479	469	773	1311			1194		
Direction, Lane #	SE 1	NW 1	NE 1	NE 2	NE 3	SW 1	SW 2					
Volume Total	1	126	0	204	69	14	213					
Volume Left	0	119	0	0	0	14	0					
Volume Right	0	5	0	0	69	0	0					
cSH	490	499	1700	1700	1700	1194	1700					
Volume to Capacity	0.00	0.25	0.00	0.12	0.04	0.01	0.13					
Queue Length 95th (m)	0.1	7.9	0.0	0.0	0.0	0.3	0.0					
Control Delay (s)	12.4	14.8	0.0	0.0	0.0	8.1	0.0					
Lane LOS	B	B				A						
Approach Delay (s)	12.4	14.8	0.0			0.5						
Approach LOS	B	B										
Intersection Summary												
Average Delay			3.2									
Intersection Capacity Utilization			27.9%	ICU Level of Service	A							
Analysis Period (min)			15									



# HCM Unsignalized Intersection Capacity Analysis

## 13: VBR & McCorvie Rd

















5/30/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	69	6	17	10	4	22	17	21	41	8	45	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	88	8	22	13	5	28	22	27	53	10	58	9
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	210	206	62	205	184	53	67			79		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	210	206	62	205	184	53	67			79		
tC, single (s)	7.2	6.7	6.5	7.4	6.6	6.3	4.5			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.2	3.6	3.7	4.1	3.4	2.6			2.3		
p0 queue free %	87	99	98	98	99	97	98			99		
cM capacity (veh/h)	687	650	927	669	675	997	1325			1469		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	118	46	101	77								
Volume Left	88	13	22	10								
Volume Right	22	28	53	9								
cSH	719	838	1325	1469								
Volume to Capacity	0.16	0.06	0.02	0.01								
Queue Length 95th (m)	4.7	1.4	0.4	0.2								
Control Delay (s)	11.0	9.5	1.8	1.0								
Lane LOS	B	A	A	A								
Approach Delay (s)	11.0	9.5	1.8	1.0								
Approach LOS	B	A										
<b>Intersection Summary</b>												
Average Delay			5.8									
Intersection Capacity Utilization			25.8%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 17: VBR

5/30/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	12	0	0	0	0	29	0	25	0	14	12	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	15	0	0	0	0	37	0	32	0	18	15	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	37			0			61	68	0	65	49	19
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	37			0			61	68	0	65	49	19
tC, single (s)	4.3			4.1			7.1	6.5	6.2	7.3	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.0	3.3	3.7	4.0	3.4
p0 queue free %	99			100			100	96	100	98	98	100
cM capacity (veh/h)	1443			1636			915	810	1091	854	827	1029
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	15	37	32	37								
Volume Left	15	0	0	18								
Volume Right	0	37	0	4								
cSH	1443	1636	810	858								
Volume to Capacity	0.01	0.00	0.04	0.04								
Queue Length 95th (m)	0.3	0.0	1.0	1.1								
Control Delay (s)	7.5	0.0	9.6	9.4								
Lane LOS	A		A	A								
Approach Delay (s)	7.5	0.0	9.6	9.4								
Approach LOS			A	A								
<b>Intersection Summary</b>												
Average Delay			6.3									
Intersection Capacity Utilization			22.3%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 27: BILC Road & Hwy 5

5/30/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↘	↙
Volume (veh/h)	165	5	8	345	6	12
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.78	0.78	0.87	0.78	0.78
Hourly flow rate (vph)	199	6	10	397	8	15
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			205		619	202
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			205		619	202
tC, single (s)			4.3		6.4	6.4
tC, 2 stage (s)						
tF (s)			2.4		3.5	3.5
p0 queue free %			99		98	98
cM capacity (veh/h)			1282		444	802

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	205	407	23
Volume Left	0	10	8
Volume Right	6	0	15
cSH	1700	1282	632
Volume to Capacity	0.12	0.01	0.04
Queue Length 95th (m)	0.0	0.2	0.9
Control Delay (s)	0.0	0.3	10.9
Lane LOS		A	B
Approach Delay (s)	0.0	0.3	10.9
Approach LOS			B

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		34.6%	ICU Level of Service A
Analysis Period (min)		15	

# HCM Unsignalized Intersection Capacity Analysis

## 3: KP Road & Hwy 5

5/30/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	↘
Volume (veh/h)	176	0	0	155	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.78	0.78	0.83	0.78	0.78
Hourly flow rate (vph)	212	0	0	187	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			212		399	212
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			212		399	212
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1358		607	828






















Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	212	187	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1358	1700
Volume to Capacity	0.12	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		12.6%	ICU Level of Service A
Analysis Period (min)		15	

# HCM Unsignalized Intersection Capacity Analysis

## 9: Hwy 5 & VBR

















5/30/2014

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	0	0	50	2	10	0	200	35	3	111	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.83	0.78	0.78	0.83	0.78
Hourly flow rate (vph)	0	0	0	64	3	13	0	241	45	4	134	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)						4						
Median type								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	384	382	134	382	382	241	134			241		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	384	382	134	382	382	241	134			241		
tC, single (s)	7.2	6.6	6.3	7.4	6.8	6.5	4.2			4.4		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.7	4.2	3.6	2.3			2.5		
p0 queue free %	100	100	100	88	100	98	100			100		
cM capacity (veh/h)	547	537	894	533	515	736	1403			1155		
Direction, Lane #	SE 1	NW 1	NE 1	NE 2	NE 3	SW 1	SW 2					
Volume Total	0	79	0	241	45	4	134					
Volume Left	0	64	0	0	0	4	0					
Volume Right	0	13	0	0	45	0	0					
cSH	1700	635	1700	1700	1700	1155	1700					
Volume to Capacity	0.00	0.13	0.00	0.14	0.03	0.00	0.08					
Queue Length 95th (m)	0.0	3.4	0.0	0.0	0.0	0.1	0.0					
Control Delay (s)	0.0	12.3	0.0	0.0	0.0	8.1	0.0					
Lane LOS	A	B				A						
Approach Delay (s)	0.0	12.3	0.0			0.2						
Approach LOS	A	B										
Intersection Summary												
Average Delay			2.0									
Intersection Capacity Utilization			20.5%	ICU Level of Service	A							
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 13: VBR & McCorvie Rd

5/30/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	2	7	3	2	3	12	5	2	15	7	42
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	38	3	9	4	3	4	15	6	3	19	9	54
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	118	114	36	123	140	8	63			9		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	118	114	36	123	140	8	63			9		
tC, single (s)	7.2	6.7	6.5	7.4	6.6	6.3	4.5			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.2	3.6	3.7	4.1	3.4	2.6			2.3		
p0 queue free %	95	100	99	100	100	100	99			99		
cM capacity (veh/h)	813	731	960	775	714	1057	1329			1560		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	50	10	24	82								
Volume Left	38	4	15	19								
Volume Right	9	4	3	54								
cSH	831	841	1329	1560								
Volume to Capacity	0.06	0.01	0.01	0.01								
Queue Length 95th (m)	1.5	0.3	0.3	0.3								
Control Delay (s)	9.6	9.3	4.9	1.8								
Lane LOS	A	A	A	A								
Approach Delay (s)	9.6	9.3	4.9	1.8								
Approach LOS	A	A										
<b>Intersection Summary</b>												
Average Delay			5.1									
Intersection Capacity Utilization			14.6%		ICU Level of Service					A		
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 17: VBR

5/30/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	8	0	0	2	0	18	0	0	2	25	2	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	10	0	0	3	0	23	0	0	3	32	3	6
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	23			0			45	49	0	40	37	12
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	23			0			45	49	0	40	37	12
tC, single (s)	4.3			4.1			7.1	6.5	6.2	7.3	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.0	3.3	3.7	4.0	3.4
p0 queue free %	99			100			100	100	100	96	100	99
cM capacity (veh/h)	1460			1636			948	832	1091	915	842	1038

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	10	26	3	41
Volume Left	10	3	0	32
Volume Right	0	23	3	6
cSH	1460	1636	1091	927
Volume to Capacity	0.01	0.00	0.00	0.04
Queue Length 95th (m)	0.2	0.0	0.1	1.1
Control Delay (s)	7.5	0.7	8.3	9.1
Lane LOS	A	A	A	A
Approach Delay (s)	7.5	0.7	8.3	9.1
Approach LOS			A	A

Intersection Summary			
Average Delay		6.1	
Intersection Capacity Utilization	18.5%		ICU Level of Service A
Analysis Period (min)		15	



# HCM Unsignalized Intersection Capacity Analysis

## 27: BILC Road & Hwy 5

5/30/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	↗
Volume (veh/h)	168	0	9	146	13	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.78	0.78	0.83	0.78	0.78
Hourly flow rate (vph)	202	0	12	176	17	10
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			202		401	202
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			202		401	202
tC, single (s)			4.3		6.4	6.4
tC, 2 stage (s)						
tF (s)			2.4		3.5	3.5
p0 queue free %			99		97	99
cM capacity (veh/h)			1285		594	802

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	202	187	27
Volume Left	0	12	17
Volume Right	0	0	10
cSH	1700	1285	659
Volume to Capacity	0.12	0.01	0.04
Queue Length 95th (m)	0.0	0.2	1.0
Control Delay (s)	0.0	0.6	10.7
Lane LOS		A	B
Approach Delay (s)	0.0	0.6	10.7
Approach LOS			B

Intersection Summary			
Average Delay		0.9	
Intersection Capacity Utilization		25.1%	ICU Level of Service
Analysis Period (min)		15	A

# HCM Unsignalized Intersection Capacity Analysis

## 3: KP Road & Hwy 5

5/30/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩			↩	↩	
Volume (veh/h)	215	0	0	428	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.78	0.78	0.87	0.78	0.78
Hourly flow rate (vph)	247	0	0	492	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			247		739	247
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			247		739	247
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1319		385	792






















Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	247	492	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1319	1700
Volume to Capacity	0.15	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		25.9%	ICU Level of Service
Analysis Period (min)		15	A

# HCM Unsignalized Intersection Capacity Analysis

## 9: Hwy 5 & VBR

















5/30/2014

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	2	0	112	2	5	0	205	66	14	214	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.83	0.78	0.78	0.78	0.87	0.78	0.78	0.87	0.78
Hourly flow rate (vph)	0	3	0	135	3	6	0	236	85	18	246	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)						4						
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	519	518	246	519	518	236	246			236		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	519	518	246	519	518	236	246			236		
tC, single (s)	7.2	6.6	6.3	7.4	6.8	6.5	4.2			4.4		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.7	4.2	3.6	2.3			2.5		
p0 queue free %	100	99	100	68	99	99	100			98		
cM capacity (veh/h)	444	444	774	425	424	741	1275			1160		
<b>Direction, Lane #</b>	<b>SE 1</b>	<b>NW 1</b>	<b>NE 1</b>	<b>NE 2</b>	<b>NE 3</b>	<b>SW 1</b>	<b>SW 2</b>					
Volume Total	3	144	0	236	85	18	246					
Volume Left	0	135	0	0	0	18	0					
Volume Right	0	6	0	0	85	0	0					
cSH	444	444	1700	1700	1700	1160	1700					
Volume to Capacity	0.01	0.32	0.00	0.14	0.05	0.02	0.14					
Queue Length 95th (m)	0.1	11.1	0.0	0.0	0.0	0.4	0.0					
Control Delay (s)	13.2	17.1	0.0	0.0	0.0	8.2	0.0					
Lane LOS	B	C				A						
Approach Delay (s)	13.2	17.1	0.0			0.6						
Approach LOS	B	C										
<b>Intersection Summary</b>												
Average Delay			3.6									
Intersection Capacity Utilization			31.3%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 13: VBR & McCorvie Rd

5/30/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	84	7	20	12	5	27	20	25	50	10	55	8
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	108	9	26	15	6	35	26	32	64	13	71	10
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	254	249	76	247	222	64	81			96		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	254	249	76	247	222	64	81			96		
tC, single (s)	7.2	6.7	6.5	7.4	6.6	6.3	4.5			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.2	3.6	3.7	4.1	3.4	2.6			2.3		
p0 queue free %	83	99	97	98	99	96	98			99		
cM capacity (veh/h)	634	611	911	620	639	984	1308			1449		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	142	56	122	94								
Volume Left	108	15	26	13								
Volume Right	26	35	64	10								
cSH	669	806	1308	1449								
Volume to Capacity	0.21	0.07	0.02	0.01								
Queue Length 95th (m)	6.4	1.8	0.5	0.2								
Control Delay (s)	11.8	9.8	1.8	1.1								
Lane LOS	B	A	A	A								
Approach Delay (s)	11.8	9.8	1.8	1.1								
Approach LOS	B	A										
<b>Intersection Summary</b>												
Average Delay			6.2									
Intersection Capacity Utilization			28.2%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 17: VBR

5/30/2014

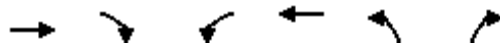


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	15	0	0	0	0	35	0	30	0	17	15	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	19	0	0	0	0	45	0	38	0	22	19	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	45			0			74	83	0	80	61	22
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	45			0			74	83	0	80	61	22
tC, single (s)	4.3			4.1			7.1	6.5	6.2	7.3	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.0	3.3	3.7	4.0	3.4
p0 queue free %	99			100			100	95	100	97	98	100
cM capacity (veh/h)	1433			1636			892	792	1091	828	813	1024
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	19	45	38	45								
Volume Left	19	0	0	22								
Volume Right	0	45	0	4								
cSH	1433	1636	792	835								
Volume to Capacity	0.01	0.00	0.05	0.05								
Queue Length 95th (m)	0.3	0.0	1.2	1.4								
Control Delay (s)	7.5	0.0	9.8	9.6								
Lane LOS	A		A	A								
Approach Delay (s)	7.5	0.0	9.8	9.6								
Approach LOS			A	A								
<b>Intersection Summary</b>												
Average Delay			6.4									
Intersection Capacity Utilization			22.7%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 27: BILC Road & Hwy 5

5/30/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	↗
Volume (veh/h)	201	6	9	419	8	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.78	0.78	0.87	0.78	0.78
Hourly flow rate (vph)	242	8	12	482	10	18
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			250		751	246
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			250		751	246
tC, single (s)			4.3		6.4	6.4
tC, 2 stage (s)						
tF (s)			2.4		3.5	3.5
p0 queue free %			99		97	98
cM capacity (veh/h)			1233		371	757

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	250	493	28
Volume Left	0	12	10
Volume Right	8	0	18
cSH	1700	1233	549
Volume to Capacity	0.15	0.01	0.05
Queue Length 95th (m)	0.0	0.2	1.3
Control Delay (s)	0.0	0.3	11.9
Lane LOS		A	B
Approach Delay (s)	0.0	0.3	11.9
Approach LOS			B

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		39.3%	ICU Level of Service
Analysis Period (min)		15	A

# HCM Unsignalized Intersection Capacity Analysis

## 3: KP Road & Hwy 5

5/30/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↔	↔
Volume (veh/h)	159	0	0	145	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.78	0.78	0.83	0.78	0.78
Hourly flow rate (vph)	192	0	0	175	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			192		366	192
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			192		366	192
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %						
		100		100		100
cM capacity (veh/h)			1382		633	850

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	192	175	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1382	1700
Volume to Capacity	0.11	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		






















Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	11.7%	ICU Level of Service	A
Analysis Period (min)	15		



# HCM Unsignalized Intersection Capacity Analysis

## 9: Hwy 5 & VBR

5/30/2014

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	0	0	76	1	11	0	134	64	7	74	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.83	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	0	0	0	97	1	14	0	161	82	9	95	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)						4						
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	275	274	95	274	274	161	95			161		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	275	274	95	274	274	161	95			161		
tC, single (s)	7.2	6.6	6.3	7.4	6.8	6.5	4.2			4.4		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.7	4.2	3.6	2.3			2.5		
p0 queue free %	100	100	100	85	100	98	100			99		
cM capacity (veh/h)	646	615	940	629	592	818	1450			1240		
<b>Direction, Lane #</b>	<b>SE 1</b>	<b>NW 1</b>	<b>NE 1</b>	<b>NE 2</b>	<b>NE 3</b>	<b>SW 1</b>	<b>SW 2</b>					
Volume Total	0	113	0	161	82	9	95					
Volume Left	0	97	0	0	0	9	0					
Volume Right	0	14	0	0	82	0	0					
cSH	1700	718	1700	1700	1700	1240	1700					
Volume to Capacity	0.00	0.16	0.00	0.09	0.05	0.01	0.06					
Queue Length 95th (m)	0.0	4.4	0.0	0.0	0.0	0.2	0.0					
Control Delay (s)	0.0	11.5	0.0	0.0	0.0	7.9	0.0					
Lane LOS	A	B				A						
Approach Delay (s)	0.0	11.5	0.0			0.7						
Approach LOS	A	B										
<b>Intersection Summary</b>												
Average Delay			3.0									
Intersection Capacity Utilization			18.0%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 13: VBR & McCorvie Rd

5/30/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	63	1	13	2	1	2	14	5	1	10	7	71
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	81	1	17	3	1	3	18	6	1	13	9	91
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	126	124	54	140	169	7	100			8		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	126	124	54	140	169	7	100			8		
tC, single (s)	7.2	6.7	6.5	7.4	6.6	6.3	4.5			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.2	3.6	3.7	4.1	3.4	2.6			2.3		
p0 queue free %	90	100	98	100	100	100	99			99		
cM capacity (veh/h)	805	723	936	750	689	1058	1286			1562		

















Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	99	6	26	113
Volume Left	81	3	18	13
Volume Right	17	3	1	91
cSH	824	832	1286	1562
Volume to Capacity	0.12	0.01	0.01	0.01
Queue Length 95th (m)	3.3	0.2	0.3	0.2
Control Delay (s)	10.0	9.4	5.5	0.9
Lane LOS	A	A	A	A
Approach Delay (s)	10.0	9.4	5.5	0.9
Approach LOS	A	A		

Intersection Summary			
Average Delay		5.3	
Intersection Capacity Utilization	20.0%		ICU Level of Service
Analysis Period (min)		15	A

# HCM Unsignalized Intersection Capacity Analysis

## 17: VBR

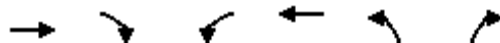
5/30/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	0	0	1	0	20	0	0	1	29	1	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	8	0	0	1	0	26	0	0	1	37	1	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	26			0			35	44	0	32	31	13
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	26			0			35	44	0	32	31	13
tC, single (s)	4.3			4.1			7.1	6.5	6.2	7.3	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.0	3.3	3.7	4.0	3.4
p0 queue free %	99			100			100	100	100	96	100	100
cM capacity (veh/h)	1457			1636			967	839	1091	929	851	1036
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	8	27	1	42								
Volume Left	8	1	0	37								
Volume Right	0	26	1	4								
cSH	1457	1636	1091	935								
Volume to Capacity	0.01	0.00	0.00	0.05								
Queue Length 95th (m)	0.1	0.0	0.0	1.1								
Control Delay (s)	7.5	0.3	8.3	9.0								
Lane LOS	A	A	A	A								
Approach Delay (s)	7.5	0.3	8.3	9.0								
Approach LOS			A	A								
<b>Intersection Summary</b>												
Average Delay			5.9									
Intersection Capacity Utilization			18.5%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 27: BILC Road & Hwy 5

5/30/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↘	↙
Volume (veh/h)	153	0	6	139	8	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.78	0.78	0.83	0.78	0.78
Hourly flow rate (vph)	184	0	8	167	10	6
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			184		367	184
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			184		367	184
tC, single (s)			4.3		6.4	6.4
tC, 2 stage (s)						
tF (s)			2.4		3.5	3.5
p0 queue free %			99		98	99
cM capacity (veh/h)			1305		623	821

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	184	175	17
Volume Left	0	8	10
Volume Right	0	0	6
cSH	1700	1305	687
Volume to Capacity	0.11	0.01	0.02
Queue Length 95th (m)	0.0	0.1	0.6
Control Delay (s)	0.0	0.4	10.4
Lane LOS		A	B
Approach Delay (s)	0.0	0.4	10.4
Approach LOS			B

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		22.2%	ICU Level of Service
Analysis Period (min)		15	A

# HCM Unsignalized Intersection Capacity Analysis

## 3: KP Road & Hwy 5

5/30/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩			↩	↩	
Volume (veh/h)	185	0	0	327	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.78	0.78	0.87	0.78	0.78
Hourly flow rate (vph)	223	0	0	376	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			223		599	223
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			223		599	223
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1346		465	817






















Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	223	376	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1346	1700
Volume to Capacity	0.13	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		20.5%	ICU Level of Service
Analysis Period (min)		15	A

# HCM Unsignalized Intersection Capacity Analysis

## 9: Hwy 5 & VBR

















5/30/2014

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	1	0	116	1	8	0	137	85	13	143	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.83	0.78	0.78	0.78	0.83	0.78	0.78	0.83	0.78
Hourly flow rate (vph)	0	1	0	140	1	10	0	165	109	17	172	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)						4						
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	371	371	172	371	371	165	172			165		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	371	371	172	371	371	165	172			165		
tC, single (s)	7.2	6.6	6.3	7.4	6.8	6.5	4.2			4.4		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.7	4.2	3.6	2.3			2.5		
p0 queue free %	100	100	100	74	100	99	100			99		
cM capacity (veh/h)	557	539	851	537	517	814	1358			1236		
<b>Direction, Lane #</b>	<b>SE 1</b>	<b>NW 1</b>	<b>NE 1</b>	<b>NE 2</b>	<b>NE 3</b>	<b>SW 1</b>	<b>SW 2</b>					
Volume Total	1	151	0	165	109	17	172					
Volume Left	0	140	0	0	0	17	0					
Volume Right	0	10	0	0	109	0	0					
cSH	539	576	1700	1700	1700	1236	1700					
Volume to Capacity	0.00	0.26	0.00	0.10	0.06	0.01	0.10					
Queue Length 95th (m)	0.1	8.4	0.0	0.0	0.0	0.3	0.0					
Control Delay (s)	11.7	13.8	0.0	0.0	0.0	8.0	0.0					
Lane LOS	B	B				A						
Approach Delay (s)	11.7	13.8	0.0			0.7						
Approach LOS	B	B										
<b>Intersection Summary</b>												
Average Delay			3.6									
Intersection Capacity Utilization			30.6%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 13: VBR & McCorvie Rd

5/30/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	99	4	19	8	3	18	22	20	34	7	39	49
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.83	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	119	5	24	10	4	23	28	26	44	9	50	63
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	228	225	81	230	235	47	113			69		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	228	225	81	230	235	47	113			69		
tC, single (s)	7.2	6.7	6.5	7.4	6.6	6.3	4.5			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.2	3.6	3.7	4.1	3.4	2.6			2.3		
p0 queue free %	82	99	97	98	99	98	98			99		
cM capacity (veh/h)	670	630	904	641	629	1005	1271			1482		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	149	37	97	122								
Volume Left	119	10	28	9								
Volume Right	24	23	44	63								
cSH	698	825	1271	1482								
Volume to Capacity	0.21	0.05	0.02	0.01								
Queue Length 95th (m)	6.4	1.1	0.5	0.1								
Control Delay (s)	11.5	9.6	2.4	0.6								
Lane LOS	B	A	A	A								
Approach Delay (s)	11.5	9.6	2.4	0.6								
Approach LOS	B	A										
<b>Intersection Summary</b>												
Average Delay			5.9									
Intersection Capacity Utilization			30.9%		ICU Level of Service				A			
Analysis Period (min)			15									



# HCM Unsignalized Intersection Capacity Analysis

## 17: VBR

5/30/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	10	0	0	0	0	35	0	20	0	19	10	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	13	0	0	0	0	45	0	26	0	24	13	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	45			0			57	71	0	61	48	22
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	45			0			57	71	0	61	48	22
tC, single (s)	4.3			4.1			7.1	6.5	6.2	7.3	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.0	3.3	3.7	4.0	3.4
p0 queue free %	99			100			100	97	100	97	98	100
cM capacity (veh/h)	1433			1636			925	809	1091	867	830	1024

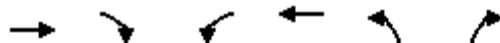
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	45	26	40
Volume Left	13	0	0	24
Volume Right	0	45	0	3
cSH	1433	1636	809	863
Volume to Capacity	0.01	0.00	0.03	0.05
Queue Length 95th (m)	0.2	0.0	0.8	1.2
Control Delay (s)	7.5	0.0	9.6	9.4
Lane LOS	A		A	A
Approach Delay (s)	7.5	0.0	9.6	9.4
Approach LOS			A	A

Intersection Summary			
Average Delay		5.8	
Intersection Capacity Utilization	22.3%		ICU Level of Service
Analysis Period (min)		15	A

# HCM Unsignalized Intersection Capacity Analysis

## 27: BILC Road & Hwy 5

5/30/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	↘
Volume (veh/h)	175	4	6	321	5	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.78	0.78	0.87	0.78	0.78
Hourly flow rate (vph)	211	5	8	369	6	12
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			216		598	213
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			216		598	213
tC, single (s)			4.3		6.4	6.4
tC, 2 stage (s)						
tF (s)			2.4		3.5	3.5
p0 queue free %			99		99	99
cM capacity (veh/h)			1270		458	790

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	216	377	18
Volume Left	0	8	6
Volume Right	5	0	12
cSH	1700	1270	627
Volume to Capacity	0.13	0.01	0.03
Queue Length 95th (m)	0.0	0.1	0.7
Control Delay (s)	0.0	0.2	10.9
Lane LOS		A	B
Approach Delay (s)	0.0	0.2	10.9
Approach LOS			B

Intersection Summary			
Average Delay		0.5	
Intersection Capacity Utilization		31.7%	ICU Level of Service
Analysis Period (min)		15	A

# HCM Unsignalized Intersection Capacity Analysis

## 3: KP Road & Hwy 5

5/30/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	↘
Volume (veh/h)	185	0	0	169	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.78	0.78	0.83	0.78	0.78
Hourly flow rate (vph)	223	0	0	204	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			223		427	223
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			223		427	223
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1346		585	817






















Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	223	204	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1346	1700
Volume to Capacity	0.13	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		13.1%	ICU Level of Service
Analysis Period (min)		15	A

# HCM Unsignalized Intersection Capacity Analysis

## 9: Hwy 5 & VBR

















5/30/2014

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	0	0	84	1	13	0	165	69	8	91	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.83	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	0	0	0	108	1	17	0	199	88	10	117	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)						4						
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	337	336	117	336	336	199	117			199		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	337	336	117	336	336	199	117			199		
tC, single (s)	7.2	6.6	6.3	7.4	6.8	6.5	4.2			4.4		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.7	4.2	3.6	2.3			2.5		
p0 queue free %	100	100	100	81	100	98	100			99		
cM capacity (veh/h)	584	567	914	571	544	778	1424			1199		
<b>Direction, Lane #</b>	<b>SE 1</b>	<b>NW 1</b>	<b>NE 1</b>	<b>NE 2</b>	<b>NE 3</b>	<b>SW 1</b>	<b>SW 2</b>					
Volume Total	0	126	0	199	88	10	117					
Volume Left	0	108	0	0	0	10	0					
Volume Right	0	17	0	0	88	0	0					
cSH	1700	658	1700	1700	1700	1199	1700					
Volume to Capacity	0.00	0.19	0.00	0.12	0.05	0.01	0.07					
Queue Length 95th (m)	0.0	5.6	0.0	0.0	0.0	0.2	0.0					
Control Delay (s)	0.0	12.4	0.0	0.0	0.0	8.0	0.0					
Lane LOS	A	B				A						
Approach Delay (s)	0.0	12.4	0.0			0.6						
Approach LOS	A	B										
<b>Intersection Summary</b>												
Average Delay			3.0									
Intersection Capacity Utilization			20.1%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 13: VBR & McCorvie Rd

















5/30/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	68	1	15	3	1	3	16	6	1	12	9	77
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	87	1	19	4	1	4	21	8	1	15	12	99
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	146	142	61	161	190	8	110			9		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	146	142	61	161	190	8	110			9		
tC, single (s)	7.2	6.7	6.5	7.4	6.6	6.3	4.5			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.2	3.6	3.7	4.1	3.4	2.6			2.3		
p0 queue free %	89	100	98	99	100	100	98			99		
cM capacity (veh/h)	779	704	929	722	668	1056	1274			1560		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	108	9	29	126								
Volume Left	87	4	21	15								
Volume Right	19	4	1	99								
cSH	801	824	1274	1560								
Volume to Capacity	0.13	0.01	0.02	0.01								
Queue Length 95th (m)	3.7	0.3	0.4	0.2								
Control Delay (s)	10.2	9.4	5.5	1.0								
Lane LOS	B	A	A	A								
Approach Delay (s)	10.2	9.4	5.5	1.0								
Approach LOS	B	A										
<b>Intersection Summary</b>												
Average Delay			5.4									
Intersection Capacity Utilization			20.8%		ICU Level of Service					A		
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 17: VBR

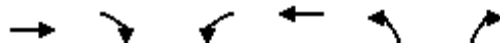
5/30/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	7	0	0	1	0	23	0	0	1	33	1	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	9	0	0	1	0	29	0	0	1	42	1	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	29			0			41	50	0	37	35	15
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	29			0			41	50	0	37	35	15
tC, single (s)	4.3			4.1			7.1	6.5	6.2	7.3	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.0	3.3	3.7	4.0	3.4
p0 queue free %	99			100			100	100	100	95	100	100
cM capacity (veh/h)	1452			1636			957	832	1091	922	845	1034
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	9	31	1	49								
Volume Left	9	1	0	42								
Volume Right	0	29	1	5								
cSH	1452	1636	1091	930								
Volume to Capacity	0.01	0.00	0.00	0.05								
Queue Length 95th (m)	0.1	0.0	0.0	1.3								
Control Delay (s)	7.5	0.3	8.3	9.1								
Lane LOS	A	A	A	A								
Approach Delay (s)	7.5	0.3	8.3	9.1								
Approach LOS			A	A								
<b>Intersection Summary</b>												
Average Delay			5.9									
Intersection Capacity Utilization			19.0%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 27: BILC Road & Hwy 5

5/30/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↔	↔
Volume (veh/h)	179	0	8	161	10	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.78	0.78	0.83	0.78	0.78
Hourly flow rate (vph)	216	0	10	194	13	8
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			216	430	216	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			216	430	216	
tC, single (s)			4.3	6.4	6.4	
tC, 2 stage (s)						
tF (s)			2.4	3.5	3.5	
p0 queue free %			99	98	99	
cM capacity (veh/h)			1270	572	788	

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	216	204	21
Volume Left	0	10	13
Volume Right	0	0	8
cSH	1700	1270	637
Volume to Capacity	0.13	0.01	0.03
Queue Length 95th (m)	0.0	0.2	0.8
Control Delay (s)	0.0	0.5	10.8
Lane LOS		A	B
Approach Delay (s)	0.0	0.5	10.8
Approach LOS			B

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization	25.0%		ICU Level of Service A
Analysis Period (min)		15	



# HCM Unsignalized Intersection Capacity Analysis

## 3: KP Road & Hwy 5

5/30/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩			↩	↩	
Volume (veh/h)	217	0	0	394	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.78	0.78	0.83	0.78	0.78
Hourly flow rate (vph)	261	0	0	475	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			261		736	261
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			261		736	261
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1303		386	777






















Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	261	475	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1303	1700
Volume to Capacity	0.15	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		24.1%	ICU Level of Service
Analysis Period (min)		15	A

# HCM Unsignalized Intersection Capacity Analysis

## 9: Hwy 5 & VBR

















5/30/2014

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	1	0	134	1	9	0	169	95	15	177	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.83	0.78	0.78	0.83	0.78
Hourly flow rate (vph)	0	1	0	172	1	12	0	204	122	19	213	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)						4						
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	456	455	213	456	455	204	213			204		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	456	455	213	456	455	204	213			204		
tC, single (s)	7.2	6.6	6.3	7.4	6.8	6.5	4.2			4.4		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.7	4.2	3.6	2.3			2.5		
p0 queue free %	100	100	100	63	100	99	100			98		
cM capacity (veh/h)	487	481	807	470	461	773	1311			1194		
Direction, Lane #	SE 1	NW 1	NE 1	NE 2	NE 3	SW 1	SW 2					
Volume Total	1	185	0	204	122	19	213					
Volume Left	0	172	0	0	0	19	0					
Volume Right	0	12	0	0	122	0	0					
cSH	481	501	1700	1700	1700	1194	1700					
Volume to Capacity	0.00	0.37	0.00	0.12	0.07	0.02	0.13					
Queue Length 95th (m)	0.1	13.4	0.0	0.0	0.0	0.4	0.0					
Control Delay (s)	12.5	16.6	0.0	0.0	0.0	8.1	0.0					
Lane LOS	B	C				A						
Approach Delay (s)	12.5	16.6	0.0			0.7						
Approach LOS	B	C										
Intersection Summary												
Average Delay			4.4									
Intersection Capacity Utilization		33.3%		ICU Level of Service	A							
Analysis Period (min)		15										

# HCM Unsignalized Intersection Capacity Analysis

## 13: VBR & McCorvie Rd

5/30/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	112	6	23	10	4	22	26	24	41	8	47	50
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.83	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	135	8	29	13	5	28	33	31	53	10	60	64
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	267	263	92	270	269	57	124			83		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	267	263	92	270	269	57	124			83		
tC, single (s)	7.2	6.7	6.5	7.4	6.6	6.3	4.5			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.2	3.6	3.7	4.1	3.4	2.6			2.3		
p0 queue free %	78	99	97	98	99	97	97			99		
cM capacity (veh/h)	624	597	891	594	599	993	1258			1465		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	172	46	117	135								
Volume Left	135	13	33	10								
Volume Right	29	28	53	64								
cSH	656	788	1258	1465								
Volume to Capacity	0.26	0.06	0.03	0.01								
Queue Length 95th (m)	8.4	1.5	0.7	0.2								
Control Delay (s)	12.4	9.9	2.4	0.6								
Lane LOS	B	A	A	A								
Approach Delay (s)	12.4	9.9	2.4	0.6								
Approach LOS	B	A										
<b>Intersection Summary</b>												
Average Delay			6.3									
Intersection Capacity Utilization			33.1%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 17: VBR

5/30/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	12	0	0	0	0	41	0	25	0	22	12	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	15	0	0	0	0	53	0	32	0	28	15	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	53			0			69	83	0	73	57	26
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	53			0			69	83	0	73	57	26
tC, single (s)	4.3			4.1			7.1	6.5	6.2	7.3	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.0	3.3	3.7	4.0	3.4
p0 queue free %	99			100			100	96	100	97	98	100
cM capacity (veh/h)	1423			1636			904	794	1091	844	819	1019

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	15	53	32	47
Volume Left	15	0	0	28
Volume Right	0	53	0	4
cSH	1423	1636	794	847
Volume to Capacity	0.01	0.00	0.04	0.06
Queue Length 95th (m)	0.3	0.0	1.0	1.4
Control Delay (s)	7.6	0.0	9.7	9.5
Lane LOS	A		A	A
Approach Delay (s)	7.6	0.0	9.7	9.5
Approach LOS			A	A

Intersection Summary			
Average Delay		6.0	
Intersection Capacity Utilization	22.7%		ICU Level of Service
Analysis Period (min)		15	A

# HCM Unsignalized Intersection Capacity Analysis

## 27: BILC Road & Hwy 5

5/30/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	206	5	8	386	6	11
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.78	0.78	0.78	0.83	0.78	0.78
Hourly flow rate (vph)	264	6	10	465	8	14
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			271		753	267
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			271		753	267
tC, single (s)			4.3		6.4	6.4
tC, 2 stage (s)						
tF (s)			2.4		3.5	3.5
p0 queue free %			99		98	98
cM capacity (veh/h)			1211		370	737

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	271	475	22
Volume Left	0	10	8
Volume Right	6	0	14
cSH	1700	1211	546
Volume to Capacity	0.16	0.01	0.04
Queue Length 95th (m)	0.0	0.2	1.0
Control Delay (s)	0.0	0.3	11.9
Lane LOS		A	B
Approach Delay (s)	0.0	0.3	11.9
Approach LOS			B

Intersection Summary			
Average Delay		0.5	
Intersection Capacity Utilization		36.7%	ICU Level of Service A
Analysis Period (min)		15	

# HCM Unsignalized Intersection Capacity Analysis

## 3: KP Road & Hwy 5

5/30/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	↘
Volume (veh/h)	192	0	0	336	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.78	0.78	0.87	0.78	0.78
Hourly flow rate (vph)	221	0	0	386	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			221		607	221
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			221		607	221
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1348		460	819






















Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	221	386	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1348	1700
Volume to Capacity	0.13	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		21.0%	ICU Level of Service A
Analysis Period (min)		15	

# HCM Unsignalized Intersection Capacity Analysis

## 9: Hwy 5 & VBR

















5/30/2014

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	2	0	153	2	10	0	140	107	18	146	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.87	0.78	0.78	0.78	0.87	0.83	0.78	0.87	0.78
Hourly flow rate (vph)	0	3	0	176	3	13	0	161	129	23	168	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)						4						
Median type								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	376	375	168	376	375	161	168			161		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	376	375	168	376	375	161	168			161		
tC, single (s)	7.2	6.6	6.3	7.4	6.8	6.5	4.2			4.4		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.7	4.2	3.6	2.3			2.5		
p0 queue free %	100	100	100	67	99	98	100			98		
cM capacity (veh/h)	548	534	856	530	512	818	1363			1240		
Direction, Lane #	SE 1	NW 1	NE 1	NE 2	NE 3	SW 1	SW 2					
Volume Total	3	191	0	161	129	23	168					
Volume Left	0	176	0	0	0	23	0					
Volume Right	0	13	0	0	129	0	0					
cSH	534	568	1700	1700	1700	1240	1700					
Volume to Capacity	0.00	0.34	0.00	0.09	0.08	0.02	0.10					
Queue Length 95th (m)	0.1	11.8	0.0	0.0	0.0	0.5	0.0					
Control Delay (s)	11.8	14.8	0.0	0.0	0.0	8.0	0.0					
Lane LOS	B	B				A						
Approach Delay (s)	11.8	14.8	0.0			1.0						
Approach LOS	B	B										
Intersection Summary												
Average Delay			4.5									
Intersection Capacity Utilization			36.3%	ICU Level of Service	A							
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 13: VBR & McCorvie Rd

5/30/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	127	7	26	12	5	27	29	28	50	10	57	51
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.83	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	153	9	33	15	6	35	37	36	64	13	73	65
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	312	306	106	312	306	68	138			100		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	312	306	106	312	306	68	138			100		
tC, single (s)	7.2	6.7	6.5	7.4	6.6	6.3	4.5			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.2	3.6	3.7	4.1	3.4	2.6			2.3		
p0 queue free %	73	98	96	97	99	96	97			99		
cM capacity (veh/h)	576	561	875	550	567	979	1242			1444		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	195	56	137	151								
Volume Left	153	15	37	13								
Volume Right	33	35	64	65								
cSH	610	756	1242	1444								
Volume to Capacity	0.32	0.07	0.03	0.01								
Queue Length 95th (m)	11.0	1.9	0.7	0.2								
Control Delay (s)	13.6	10.1	2.4	0.7								
Lane LOS	B	B	A	A								
Approach Delay (s)	13.6	10.1	2.4	0.7								
Approach LOS	B	B										
<b>Intersection Summary</b>												
Average Delay			6.8									
Intersection Capacity Utilization			35.1%		ICU Level of Service				A			
Analysis Period (min)			15									



# HCM Unsignalized Intersection Capacity Analysis

17: VBR

5/30/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	15	0	0	0	0	47	0	30	0	25	15	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	19	0	0	0	0	60	0	38	0	32	19	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	60			0			82	99	0	88	69	30
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	60			0			82	99	0	88	69	30
tC, single (s)	4.3			4.1			7.1	6.5	6.2	7.3	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.0	3.3	3.7	4.0	3.4
p0 queue free %	99			100			100	95	100	96	98	100
cM capacity (veh/h)	1414			1636			881	777	1091	817	805	1014

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	19	60	38	55
Volume Left	19	0	0	32
Volume Right	0	60	0	4
cSH	1414	1636	777	824
Volume to Capacity	0.01	0.00	0.05	0.07
Queue Length 95th (m)	0.3	0.0	1.2	1.7
Control Delay (s)	7.6	0.0	9.9	9.7
Lane LOS	A		A	A
Approach Delay (s)	7.6	0.0	9.9	9.7
Approach LOS			A	A

Intersection Summary			
Average Delay		6.1	
Intersection Capacity Utilization	23.2%		ICU Level of Service
Analysis Period (min)		15	A

# HCM Unsignalized Intersection Capacity Analysis

## 27: BILC Road & Hwy 5

5/30/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↔	↔
Volume (veh/h)	178	6	9	327	8	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.78	0.78	0.87	0.78	0.78
Hourly flow rate (vph)	205	8	12	376	10	18
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			212		607	208
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			212		607	208
tC, single (s)			4.3		6.4	6.4
tC, 2 stage (s)						
tF (s)			2.4		3.5	3.5
p0 queue free %			99		98	98
cM capacity (veh/h)			1274		450	795

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	212	387	28
Volume Left	0	12	10
Volume Right	8	0	18
cSH	1700	1274	622
Volume to Capacity	0.12	0.01	0.05
Queue Length 95th (m)	0.0	0.2	1.1
Control Delay (s)	0.0	0.3	11.1
Lane LOS		A	B
Approach Delay (s)	0.0	0.3	11.1
Approach LOS			B

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		34.5%	ICU Level of Service
Analysis Period (min)		15	A

# HCM Unsignalized Intersection Capacity Analysis

## 3: KP Road & Hwy 5

5/30/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↔	↔
Volume (veh/h)	220	0	0	393	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.78	0.78	0.87	0.78	0.78
Hourly flow rate (vph)	253	0	0	452	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			253		705	253
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			253		705	253
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1312		403	786






















Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	253	452	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1312	1700
Volume to Capacity	0.15	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization	24.0%	ICU Level of Service	A
Analysis Period (min)	15		

# HCM Unsignalized Intersection Capacity Analysis

## 9: Hwy 5 & VBR

















5/30/2014

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	2	0	153	2	10	0	205	107	18	176	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.87	0.78	0.78	0.78	0.87	0.83	0.78	0.87	0.78
Hourly flow rate (vph)	0	3	0	176	3	13	0	236	129	23	202	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)						4						
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	485	484	202	485	484	236	202			236		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	485	484	202	485	484	236	202			236		
tC, single (s)	7.2	6.6	6.3	7.4	6.8	6.5	4.2			4.4		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.7	4.2	3.6	2.3			2.5		
p0 queue free %	100	99	100	61	99	98	100			98		
cM capacity (veh/h)	462	462	819	446	442	741	1323			1160		
<b>Direction, Lane #</b>	<b>SE 1</b>	<b>NW 1</b>	<b>NE 1</b>	<b>NE 2</b>	<b>NE 3</b>	<b>SW 1</b>	<b>SW 2</b>					
Volume Total	3	191	0	236	129	23	202					
Volume Left	0	176	0	0	0	23	0					
Volume Right	0	13	0	0	129	0	0					
cSH	462	478	1700	1700	1700	1160	1700					
Volume to Capacity	0.01	0.40	0.00	0.14	0.08	0.02	0.12					
Queue Length 95th (m)	0.1	15.2	0.0	0.0	0.0	0.5	0.0					
Control Delay (s)	12.8	17.8	0.0	0.0	0.0	8.2	0.0					
Lane LOS	B	C				A						
Approach Delay (s)	12.8	17.8	0.0			0.8						
Approach LOS	B	C										
<b>Intersection Summary</b>												
Average Delay			4.6									
Intersection Capacity Utilization			36.9%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 13: VBR & McCorvie Rd

5/30/2014

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Volume (veh/h)	127	7	26	12	5	27	29	28	50	10	57	51	
Sign Control		Stop			Stop			Free			Free		
Grade		0%			0%			0%			0%		
Peak Hour Factor	0.83	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	
Hourly flow rate (vph)	153	9	33	15	6	35	37	36	64	13	73	65	
Pedestrians													
Lane Width (m)													
Walking Speed (m/s)													
Percent Blockage													
Right turn flare (veh)													
Median type							None						
Median storage (veh)													
Upstream signal (m)													
pX, platoon unblocked													
vC, conflicting volume	312	306	106	312	306	68	138						100
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	312	306	106	312	306	68	138						100
tC, single (s)	7.2	6.7	6.5	7.4	6.6	6.3	4.5						4.2
tC, 2 stage (s)													
tF (s)	3.6	4.2	3.6	3.7	4.1	3.4	2.6						2.3
p0 queue free %	73	98	96	97	99	96	97						99
cM capacity (veh/h)	576	561	875	550	567	979	1242						1444
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>									
Volume Total	195	56	137	151									
Volume Left	153	15	37	13									
Volume Right	33	35	64	65									
cSH	610	756	1242	1444									
Volume to Capacity	0.32	0.07	0.03	0.01									
Queue Length 95th (m)	11.0	1.9	0.7	0.2									
Control Delay (s)	13.6	10.1	2.4	0.7									
Lane LOS	B	B	A	A									
Approach Delay (s)	13.6	10.1	2.4	0.7									
Approach LOS	B	B											
<b>Intersection Summary</b>													
Average Delay			6.8										
Intersection Capacity Utilization			35.1%	ICU Level of Service	A								
Analysis Period (min)			15										

# HCM Unsignalized Intersection Capacity Analysis

17: VBR

5/30/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	15	0	0	0	0	47	0	30	0	25	15	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	19	0	0	0	0	60	0	38	0	32	19	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	60			0			82	99	0	88	69	30
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	60			0			82	99	0	88	69	30
tC, single (s)	4.3			4.1			7.1	6.5	6.2	7.3	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.0	3.3	3.7	4.0	3.4
p0 queue free %	99			100			100	95	100	96	98	100
cM capacity (veh/h)	1414			1636			881	777	1091	817	805	1014

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	19	60	38	55
Volume Left	19	0	0	32
Volume Right	0	60	0	4
cSH	1414	1636	777	824
Volume to Capacity	0.01	0.00	0.05	0.07
Queue Length 95th (m)	0.3	0.0	1.2	1.7
Control Delay (s)	7.6	0.0	9.9	9.7
Lane LOS	A		A	A
Approach Delay (s)	7.6	0.0	9.9	9.7
Approach LOS			A	A

Intersection Summary			
Average Delay		6.1	
Intersection Capacity Utilization	23.2%		ICU Level of Service
Analysis Period (min)		15	A

# HCM Unsignalized Intersection Capacity Analysis

## 27: BILC Road & Hwy 5

5/30/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↔	↔
Volume (veh/h)	206	6	9	384	8	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.78	0.78	0.87	0.78	0.78
Hourly flow rate (vph)	237	8	12	441	10	18
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			244		705	241
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			244		705	241
tC, single (s)			4.3		6.4	6.4
tC, 2 stage (s)						
tF (s)			2.4		3.5	3.5
p0 queue free %			99		97	98
cM capacity (veh/h)			1239		395	763

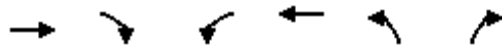
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	244	453	28
Volume Left	0	12	10
Volume Right	8	0	18
cSH	1700	1239	569
Volume to Capacity	0.14	0.01	0.05
Queue Length 95th (m)	0.0	0.2	1.2
Control Delay (s)	0.0	0.3	11.7
Lane LOS		A	B
Approach Delay (s)	0.0	0.3	11.7
Approach LOS			B

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		37.4%	ICU Level of Service A
Analysis Period (min)		15	

# HCM Unsignalized Intersection Capacity Analysis

## 3: KP Road & Hwy 5

5/30/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻			↻	↻	
Volume (veh/h)	217	0	0	196	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.78	0.78	0.83	0.78	0.78
Hourly flow rate (vph)	249	0	0	236	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			249		486	249
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			249		486	249
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1316		541	789

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	249	236	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1316	1700
Volume to Capacity	0.15	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A






















Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		14.8%	ICU Level of Service A
Analysis Period (min)		15	



# HCM Unsignalized Intersection Capacity Analysis

## 9: Hwy 5 & VBR

















5/30/2014

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	0	0	92	3	14	0	200	76	8	111	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.83	0.78	0.78	0.83	0.78
Hourly flow rate (vph)	0	0	0	118	4	18	0	241	97	10	134	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)						4						
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	397	395	134	395	395	241	134			241		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	397	395	134	395	395	241	134			241		
tC, single (s)	7.2	6.6	6.3	7.4	6.8	6.5	4.2			4.4		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.7	4.2	3.6	2.3			2.5		
p0 queue free %	100	100	100	77	99	98	100			99		
cM capacity (veh/h)	529	525	894	520	503	736	1403			1155		
<b>Direction, Lane #</b>	<b>SE 1</b>	<b>NW 1</b>	<b>NE 1</b>	<b>NE 2</b>	<b>NE 3</b>	<b>SW 1</b>	<b>SW 2</b>					
Volume Total	0	140	0	241	97	10	134					
Volume Left	0	118	0	0	0	10	0					
Volume Right	0	18	0	0	97	0	0					
cSH	1700	596	1700	1700	1700	1155	1700					
Volume to Capacity	0.00	0.23	0.00	0.14	0.06	0.01	0.08					
Queue Length 95th (m)	0.0	7.2	0.0	0.0	0.0	0.2	0.0					
Control Delay (s)	0.0	13.5	0.0	0.0	0.0	8.1	0.0					
Lane LOS	A	B				A						
Approach Delay (s)	0.0	13.5	0.0			0.6						
Approach LOS	A	B										
<b>Intersection Summary</b>												
Average Delay			3.2									
Intersection Capacity Utilization			22.4%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 13: VBR & McCorvie Rd

















5/30/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	73	2	16	3	2	3	18	7	2	15	10	85
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	94	3	21	4	3	4	23	9	3	19	13	109
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	167	163	67	184	217	10	122			12		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	167	163	67	184	217	10	122			12		
tC, single (s)	7.2	6.7	6.5	7.4	6.6	6.3	4.5			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.2	3.6	3.7	4.1	3.4	2.6			2.3		
p0 queue free %	88	100	98	99	100	100	98			99		
cM capacity (veh/h)	750	681	921	692	642	1054	1261			1557		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	117	10	35	141								
Volume Left	94	4	23	19								
Volume Right	21	4	3	109								
cSH	773	777	1261	1557								
Volume to Capacity	0.15	0.01	0.02	0.01								
Queue Length 95th (m)	4.2	0.3	0.4	0.3								
Control Delay (s)	10.5	9.7	5.3	1.1								
Lane LOS	B	A	A	A								
Approach Delay (s)	10.5	9.7	5.3	1.1								
Approach LOS	B	A										
<b>Intersection Summary</b>												
Average Delay			5.5									
Intersection Capacity Utilization			23.1%		ICU Level of Service					A		
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 17: VBR

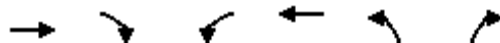
5/30/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	0	0	2	0	26	0	0	2	37	2	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	10	0	0	3	0	33	0	0	3	47	3	6
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	33			0			50	59	0	45	42	17
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	33			0			50	59	0	45	42	17
tC, single (s)	4.3			4.1			7.1	6.5	6.2	7.3	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.0	3.3	3.7	4.0	3.4
p0 queue free %	99			100			100	100	100	95	100	99
cM capacity (veh/h)	1447			1636			940	821	1091	908	836	1031
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	10	36	3	56								
Volume Left	10	3	0	47								
Volume Right	0	33	3	6								
cSH	1447	1636	1091	917								
Volume to Capacity	0.01	0.00	0.00	0.06								
Queue Length 95th (m)	0.2	0.0	0.1	1.6								
Control Delay (s)	7.5	0.5	8.3	9.2								
Lane LOS	A	A	A	A								
Approach Delay (s)	7.5	0.5	8.3	9.2								
Approach LOS			A	A								
<b>Intersection Summary</b>												
Average Delay			6.0									
Intersection Capacity Utilization			19.1%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

22:

5/30/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↙	↘
Volume (veh/h)	0	0	0	0	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0			0	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0			0	0	
tC, single (s)	4.1			6.4	6.2	
tC, 2 stage (s)						
tF (s)	2.2			3.5	3.3	
p0 queue free %	100			100	100	
cM capacity (veh/h)	1623			1023	1085	

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	0	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		

# HCM Unsignalized Intersection Capacity Analysis

## 27: BILC Road & Hwy 5

5/30/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	209	0	9	187	13	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.78	0.78	0.83	0.78	0.78
Hourly flow rate (vph)	240	0	12	225	17	10
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			240	489		240
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			240	489		240
tC, single (s)			4.3	6.4		6.4
tC, 2 stage (s)						
tF (s)			2.4	3.5		3.5
p0 queue free %			99	97		99
cM capacity (veh/h)			1243	528		763

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	240	237	27
Volume Left	0	12	17
Volume Right	0	0	10
cSH	1700	1243	598
Volume to Capacity	0.14	0.01	0.04
Queue Length 95th (m)	0.0	0.2	1.1
Control Delay (s)	0.0	0.5	11.3
Lane LOS	A		B
Approach Delay (s)	0.0	0.5	11.3
Approach LOS	B		

Intersection Summary			
Average Delay			0.8
Intersection Capacity Utilization	27.2%		ICU Level of Service
Analysis Period (min)			15
A			

# HCM Unsignalized Intersection Capacity Analysis

## 3: KP Road & Hwy 5

5/30/2014
























Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	↔	↔
Volume (veh/h)	256	0	0	469	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.78	0.78	0.87	0.78	0.78
Hourly flow rate (vph)	294	0	0	539	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			294		833	294
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			294		833	294
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %						
		100		100		100
cM capacity (veh/h)			1267		338	745
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	294	539	0			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1267	1700			
Volume to Capacity	0.17	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS						
			A			
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS						
			A			
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			28.0%	ICU Level of Service		A
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 9: Hwy 5 & VBR

















5/30/2014

												
Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	0	2	0	153	2	10	0	205	107	18	214	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.87	0.78	0.78	0.78	0.87	0.83	0.78	0.87	0.78
Hourly flow rate (vph)	0	3	0	176	3	13	0	236	129	23	246	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)						4						
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	529	528	246	529	528	236	246			236		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	529	528	246	529	528	236	246			236		
tC, single (s)	7.2	6.6	6.3	7.4	6.8	6.5	4.2			4.4		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.7	4.2	3.6	2.3			2.5		
p0 queue free %	100	99	100	58	99	98	100			98		
cM capacity (veh/h)	431	436	774	416	416	741	1275			1160		
Direction, Lane #	SE 1	NW 1	NE 1	NE 2	NE 3	SW 1	SW 2					
Volume Total	3	191	0	236	129	23	246					
Volume Left	0	176	0	0	0	23	0					
Volume Right	0	13	0	0	129	0	0					
cSH	436	446	1700	1700	1700	1160	1700					
Volume to Capacity	0.01	0.43	0.00	0.14	0.08	0.02	0.14					
Queue Length 95th (m)	0.1	16.9	0.0	0.0	0.0	0.5	0.0					
Control Delay (s)	13.3	19.3	0.0	0.0	0.0	8.2	0.0					
Lane LOS	B	C				A						
Approach Delay (s)	13.3	19.3	0.0			0.7						
Approach LOS	B	C										
Intersection Summary												
Average Delay			4.7									
Intersection Capacity Utilization		36.9%		ICU Level of Service	A							
Analysis Period (min)		15										

# HCM Unsignalized Intersection Capacity Analysis

## 13: VBR & McCorvie Rd

5/30/2014

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	127	7	26	12	5	27	29	28	50	10	57	51
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.83	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	153	9	33	15	6	35	37	36	64	13	73	65
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	312	306	106	312	306	68	138			100		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	312	306	106	312	306	68	138			100		
tC, single (s)	7.2	6.7	6.5	7.4	6.6	6.3	4.5			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.2	3.6	3.7	4.1	3.4	2.6			2.3		
p0 queue free %	73	98	96	97	99	96	97			99		
cM capacity (veh/h)	576	561	875	550	567	979	1242			1444		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	195	56	137	151								
Volume Left	153	15	37	13								
Volume Right	33	35	64	65								
cSH	610	756	1242	1444								
Volume to Capacity	0.32	0.07	0.03	0.01								
Queue Length 95th (m)	11.0	1.9	0.7	0.2								
Control Delay (s)	13.6	10.1	2.4	0.7								
Lane LOS	B	B	A	A								
Approach Delay (s)	13.6	10.1	2.4	0.7								
Approach LOS	B	B										
<b>Intersection Summary</b>												
Average Delay			6.8									
Intersection Capacity Utilization			35.1%		ICU Level of Service				A			
Analysis Period (min)			15									



# HCM Unsignalized Intersection Capacity Analysis

17: VBR

5/30/2014



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	15	0	0	0	0	47	0	30	0	25	15	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	19	0	0	0	0	60	0	38	0	32	19	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	60			0			82	99	0	88	69	30
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	60			0			82	99	0	88	69	30
tC, single (s)	4.3			4.1			7.1	6.5	6.2	7.3	6.5	6.3
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.0	3.3	3.7	4.0	3.4
p0 queue free %	99			100			100	95	100	96	98	100
cM capacity (veh/h)	1414			1636			881	777	1091	817	805	1014

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	19	60	38	55
Volume Left	19	0	0	32
Volume Right	0	60	0	4
cSH	1414	1636	777	824
Volume to Capacity	0.01	0.00	0.05	0.07
Queue Length 95th (m)	0.3	0.0	1.2	1.7
Control Delay (s)	7.6	0.0	9.9	9.7
Lane LOS	A		A	A
Approach Delay (s)	7.6	0.0	9.9	9.7
Approach LOS			A	A

Intersection Summary			
Average Delay		6.1	
Intersection Capacity Utilization	23.2%		ICU Level of Service
Analysis Period (min)		15	A

# HCM Unsignalized Intersection Capacity Analysis

## 27: BILC Road & Hwy 5

5/30/2014



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	↘
Volume (veh/h)	242	6	9	460	8	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.87	0.78	0.78	0.87	0.78	0.78
Hourly flow rate (vph)	278	8	12	529	10	18
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			286		834	282
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			286		834	282
tC, single (s)			4.3		6.4	6.4
tC, 2 stage (s)						
tF (s)			2.4		3.5	3.5
p0 queue free %			99		97	98
cM capacity (veh/h)			1195		331	722

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	286	540	28
Volume Left	0	12	10
Volume Right	8	0	18
cSH	1700	1195	505
Volume to Capacity	0.17	0.01	0.06
Queue Length 95th (m)	0.0	0.2	1.4
Control Delay (s)	0.0	0.3	12.5
Lane LOS		A	B
Approach Delay (s)	0.0	0.3	12.5
Approach LOS			B

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		41.4%	ICU Level of Service
Analysis Period (min)		15	A