MMM GROUP

Prepared for: County of Simcoe

ENVIRONMENTAL RESOURCE RECOVERY CENTRE
2976 HORSESHOE VALLEY ROAD WEST
TOWNSHIP OF SPRINGWATER

TRAFFIC IMPACT STUDY

16-16057-001-T01 | November 2016

WSP | MMM GROUP

MMM Group Limited
100 Commerce Valley Drive West
Thornhill, ON Canada L3T 0A1
t: 905.882.1100 | f: 905.882.0055

www.mmmgrouplimited.com

November 16, 2016
16-16057-001

Ms Stephanie Mack, P.Eng.
Special Projects Supervisor
Solid Waste Management
County of Simcoe
1110 Highway 26
Midhurst, ON L0L 1X0

Dear Ms Mack:

Subject: Traffic Impact Study
Proposed Environmental Resource Recovery Centre
2976 Horseshoe Valley Road West
Township of Springwater

MMM Group Limited (MMM) was retained by the Solid Waste Management (SWM) Department of the County of Simcoe to undertake a Traffic Impact Study for the proposed Environmental Resource Recovery Centre (ERRC) to be located at 2976 Horseshoe Valley Road West in the Township of Springwater. The development will house a Materials Management Facility (MMF) and an Organics Processing Facility (OPF).

Based on the enclosed analysis, it is expected that the site-generated traffic will not adversely impact the boundary road network for any of the 2021, 2026 or 2031 horizons. The future road network will become very busy beyond the 2026 horizon as a result of the significant increase in background traffic in the vicinity of the ERRC. Therefore, we recommend that in addition to the geometric improvements in the vicinity of the site access, the County monitor traffic conditions and specify the necessary road improvements that are triggered by and will be the responsibility of future developments in this area.

We thank you for the opportunity to undertake this study. Please contact us if you have any questions or comments with respect to our report.

Yours truly,

MMM GROUP LIMITED

David B. Richardson, P.Eng., PTOE
Senior Project Manager & Partner
Transportation Planning

Fei Yang, M.A.Sc.,P.Eng.
Project Engineer
Transportation Planning

Encl.

J:\01 PROJECTS\2016 Jobs\16-16057-001.DBR (Simcoe Horseshoe Valley TIS)\07. Deliverables - Submissions\03. Reports\Front Matter\Cover letter.docx

PROJECT TEAM MEMBER LIST

Project Manager:	Dave Richardson, P.Eng, PTOE
Project Co-ordinator:	Fei Yang, M.A.Sc., P.Eng
Support Staff:	Matthew Chou Michael Di Febo, B.A (Hons.)

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1.0 INTRODUCTION

MMM Group Limited (MMM) was retained by the County of Simcoe to prepare a Traffic Impact Study (TIS) for the proposed Environmental Resource Recovery Centre (ERRC) located at 2976 Horseshoe Valley Road West in the Township of Springwater. It is our understanding that the ERRC will consist of:

- *Materials Management Facility (MMF)* – a location for the consolidation and transfer of waste, including garbage, blue box recycling and organics, from multiple collection vehicles for more economical shipment to other disposal or processing locations;
- *Organics Processing Facility (OPF)* – a location where green bin materials such as kitchen waste, soiled paper products and potentially other materials including leaf and yard waste, pet waste, diapers and sanitary products are processed under controlled conditions and converted into other valuable products such as compost or fertilizer; and
- *Other* – additional developments include a Solid Waste Management (SWM) truck servicing area, a public education area and the potential for future expansion to a sorting facility for recycled materials. This is not expected to generate significant additional traffic.

The MMF and OPF will be open in 2019 and 2021, respectively. They will approach their design capacity in 2049. A single full-moves access is proposed onto County Road 22 to accommodate the site traffic. The site location and study area are shown in **Figure 1.1**.

The main objectives of this study are to:

- Evaluate if there are any adverse impacts on the local road network related to the proposed ERRC, primarily the MMF and OPF since the "*Other"* component is not expected to generate much, if any, additional traffic;
- Evaluate the proposed site access location in terms of compliance with the requirement for stopping sight distance;
- Determine the intersection control type for the site access; and
- Identify the lane configurations for the site access.

Our study approach and findings are documented herein.

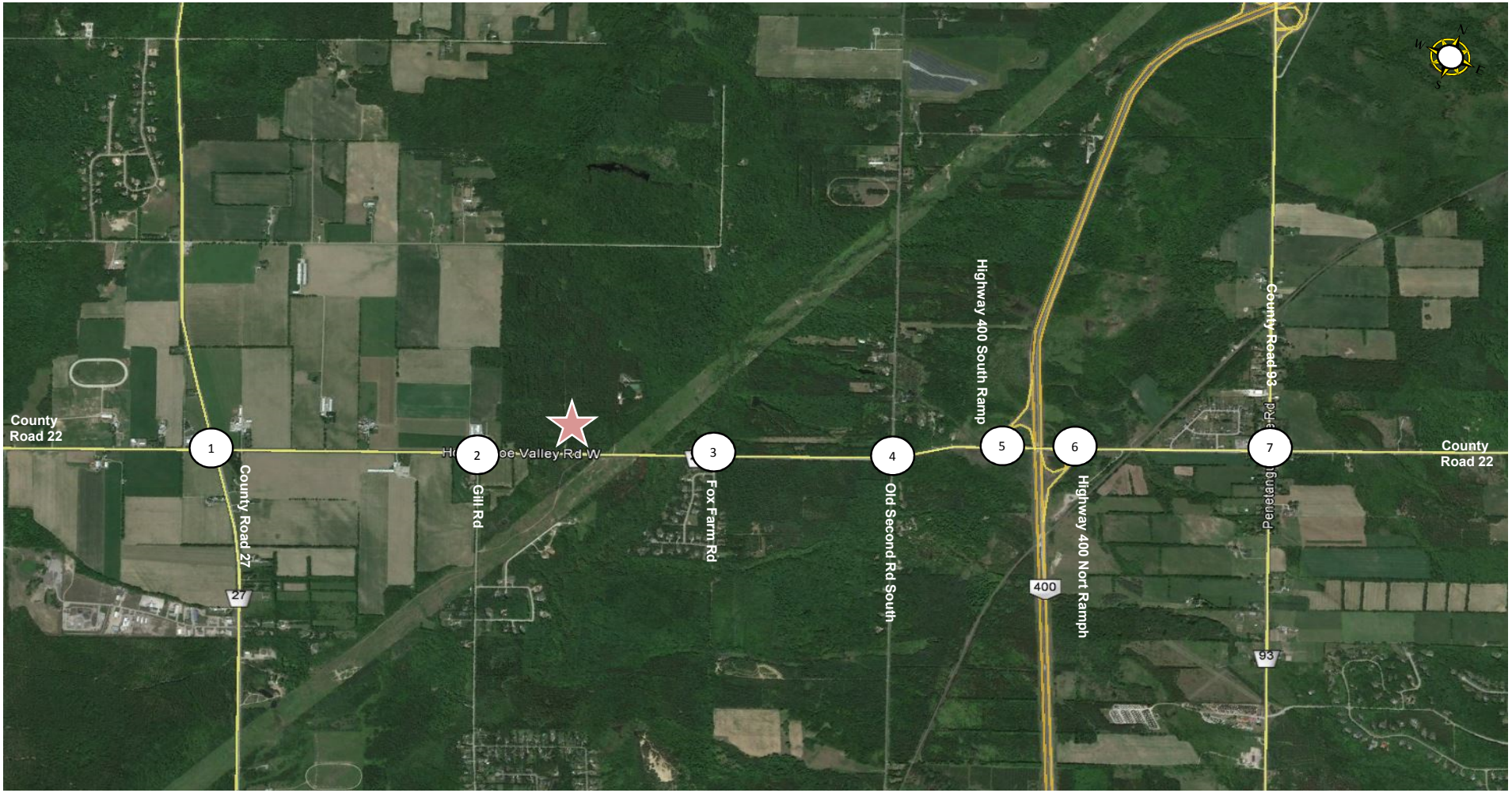


*Figure Not to Scale

WSP | MMM GROUP

LEGEND

(#) Study Intersection

Proposed Site

FIGURE 1.1
Site Location

2.0 EXISTING CONDITIONS

This section of our report describes the existing road network and traffic conditions within the study area.

2.1 Boundary Roadways

The study area includes the following roadways which are under the jurisdiction of the County of Simcoe unless otherwise indicated:

- **County Road 22 (Horseshoe Valley Road West)** is an east-west arterial road with a two-lane cross-section. The posted speed limit is 80 km/h along this roadway except for the sections within the area known locally as “Craighurst” where 50 km/h is posted.

- **County Road 27** is a north-south arterial road with a three-lane cross-section to a point approximately 300 m to the north of County Road 22. It has a posted speed limit of 80 km/h.

- **County Road 93 (Penetanguishene Road)** is a north-south arterial road with a two-lane cross-section. The posted speed limit is 80 km/h along this roadway except for the sections within the area known locally as “Craighurst” where 50 km/h is posted.

- **Gill Road** is a north-south roadway under the jurisdiction of the Township of Springwater. This road has a two-lane cross-section and a posted speed limit of 60 km/h.

- **Fox Farm Road** is a north-south roadway under the jurisdiction of the Township of Springwater. This road has a two-lane cross-section, but no posted speed limit signs, so 80 km/h has been assumed.

- **Old Second South** is a north-south roadway under the jurisdiction of the Township of Springwater. This road has a two-lane cross-section, but no posted speed limit signs, so 80 km/h has been assumed.

- **Highway 400 South** and **North Ramps** at County Road 22 are under the jurisdiction of the Ministry of Transportation Ontario (MTO). They are both stop-controlled at County Road 22.

The existing lane configurations on the area road network are illustrated in **Figure 2.1**.

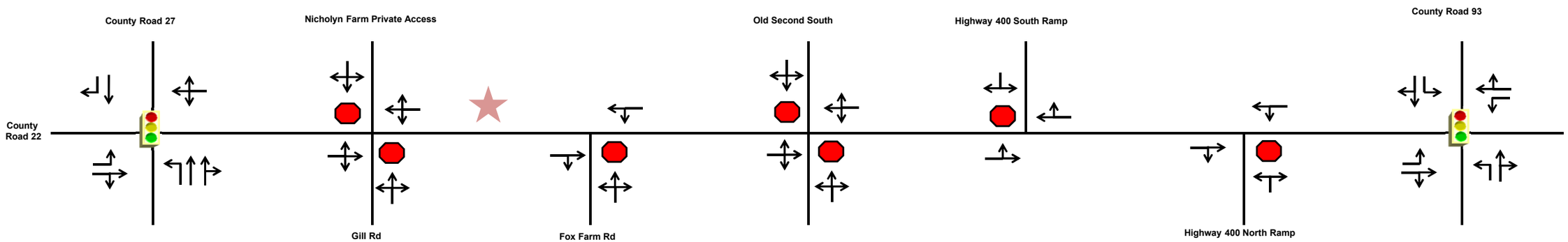


*Figure Not to Scale

WSP | MMM GROUP

LEGEND

Proposed Site

FIGURE 2.1

Existing Lane Configurations

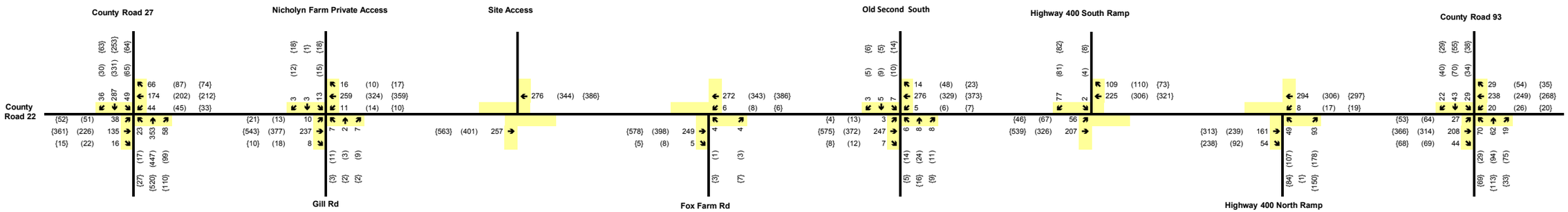


*Figure Not to Scale

LEGEND

XX Weekday AM Peak Hour Volumes
(XX) Weekday PM Peak Hour Volumes
{XX} Friday PM Peak Hour Volumes

FIGURE 2.2
Existing Traffic Conditions

2.2 Traffic Data

Turning movement counts (TMCs) were undertaken by Spectrum Traffic Data Inc. during a typical weekday from 7 a.m. to noon and 4 to 7 p.m., plus a Friday from 4 to 7 p.m. during the summer season of 2016. Please note that the proposed data collection periods were based on our review of the 2014 seasonal Average Daily Traffic (ADT) data on County Road 22 which was provided by the County. It was found that the average weekday a.m. and p.m. peak traffic volumes during the summer are generally greater than the volumes during the spring and fall periods. The Friday evening peak was selected based on local experience which indicates that this is also a busy period. The details of the TMCs are summarized in **Table 2.1**.

TABLE 2.1
INTERSECTION COUNTS COLLECTED FOR THIS STUDY

Intersections with County Road 22	Types	TMC Date and Time
County Road 27	Signalized, 4-legged intersection	Wednesday, August 03, 2016 Friday, August 05, 2016
Gill Road	Unsignalized, 4-legged intersection*	Wednesday, August 03, 2016 Friday, August 05, 2016
Fox Farm Road	Unsignalized, 3-legged intersection	Wednesday, August 03, 2016 Friday, August 05, 2016
Old Second South	Unsignalized, 4-legged intersection	Wednesday, August 03, 2016 Friday, August 05, 2016
Highway 400 South Ramp	Unsignalized, 3-legged intersection	Wednesday, August 03, 2016 Friday, August 05, 2016
Highway 400 North Ramp	Unsignalized, 3-legged intersection	Wednesday, August 03, 2016 Friday, August 05, 2016
County Road 93	Signalized, 4-legged intersection	Wednesday, August 03, 2016 Friday, August 05, 2016

** The north leg of Gill Road is a private driveway serving Nicholyn Farms.*

The peak hour volumes at each intersection were determined accordingly. The resultant existing weekday a.m. and p.m. peak hour traffic volumes are shown in **Figure 2.2**. The existing TMC data and signal timing plans (STP) are presented in **Appendix A**.

2.3 Existing Conditions

Methodology

In order to analyze existing traffic conditions in the study area, capacity analyses were undertaken using the ***Synchro 9*** traffic analysis software. This software incorporates the methodology outlined in the *Highway Capacity Manual (HCM), Transportation Research Board, 2000*.

An intersection capacity analysis provides an indication of traffic operations based on calculations of volume-to-capacity (v/c) ratios and delays for individual movements.

The v/c ratio is a measure of the relative "busyness" of a particular movement or an entire intersection. Conditions where v/c ratios are less than 1.0 indicate that there is reserve capacity to accommodate additional traffic. When v/c ratios are equal to 1.0, this is an indication that the movement or approach to an intersection is "at capacity" and cannot accept any additional traffic. V/C ratios play a vital role in the interpretation of intersection capacity analysis since they directly relate to the ability of roadway to physically accommodate the traffic demands during a given time period.

Delay also plays an important role in providing an indication of intersection performance. Delay can be translated to a qualitative measure which is Level of Service (LOS). A LOS of 'A' through 'D' represents satisfactory traffic conditions. LOS denoted by the letters 'E' and 'F' represents congested traffic conditions. The LOS definitions for signalized and unsignalized intersections are included in **Appendix B**.

Careful consideration must be given to the interpretation of LOS. For example, there are circumstances where the LOS is 'F' but v/c ratios are relatively low for movements at a stop-controlled minor street or driveway which carries low traffic volumes. In this situation, no mitigation may be required, or perhaps minor adjustments to pavement markings or lane designations. For signalized intersections, a poor LOS can often be mitigated by simple adjustments to signal timing or phasing. As a result, it is not uncommon for a minor street or driveway onto a major arterial road to experience LOS 'F' during peak hours but still operate under capacity.

Calibration

Traffic operations were analyzed at the study area intersections to determine the existing LOS. For existing conditions, an approach peak hour factor (PHF) was applied instead of individual movement PHFs. Since the peak 15-minute period for each movement does not occur simultaneously, applying PHFs for individual movements is not appropriate. Since a PHF is not available for future conditions, a typical value of 0.95 was adopted. This approach is also consistent with the background studies which we have reviewed in this area.

Existing Traffic Conditions

Traffic operations were analyzed at the key intersections to determine the existing Levels of Service during the weekday a.m. and p.m. peak hours. The results of the intersection capacity analysis under existing conditions are summarized in **Table 2.2**. Detailed intersection capacity analysis sheets are included in **Appendix C**.

TABLE 2.2
INTERSECTION CAPACITY ANALYSIS
EXISTING TRAFFIC CONDITIONS

Intersections with County Road 22	Control Type	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour		Friday P.M. Peak Hour	
		LOS (Delay) in Seconds	Critical Movements in Bold (v/c)	LOS (Delay) in Seconds	Critical Movements in Bold (v/c)	LOS (Delay) in Seconds	Critical Movements in Bold (v/c)
County Road 27	Signalized	C (22)	EB-L (0.11) EB-TR (0.26) WB-LTR (0.52) NB-L (0.05) NB-TR (0.26) SB-L (0.13) SB-T (0.35) SB-R (0.05)	C (26)	EB-L (0.17) EB-TR (0.42) WB-LTR (0.61) NB-L (0.04) NB-TR (0.35) SB-L (0.19) SB-T (0.40) SB-R (0.04)	C (26)	EB-L (0.17) EB-TR (0.63) WB-LTR (0.61) NB-L (0.06) NB-TR (0.40) SB-L (0.22) SB-T (0.31) SB-R (0.08)
County Road 93	Signalized	B (16)	EB-L (0.07) EB-TR (0.36) WB-L (0.05) WB-TR (0.39) NB-L (0.15) NB-TR (0.12) SB-L (0.06) SB-TR (0.10)	B (17)	EB-L (0.17) EB-TR (0.55) WB-L (0.09) WB-TR (0.44) NB-L (0.07) NB-TR (0.24) SB-L (0.07) SB-TR (0.16)	B (19)	EB-L (0.14) EB-TR (0.62) WB-L (0.08) WB-TR (0.44) NB-L (0.15) NB-TR (0.21) SB-L (0.08) SB-TR (0.13)
Gill Road	Unsignalized	B (14)	EB-LTR (0.01) WB-LTR (0.01) NB-LTR (0.03) SB-LTR (0.05)	C (16)	EB-LTR (0.01) WB-LTR (0.01) NB-LTR (0.07) SB-LTR (0.08)	C (20)	EB-LTR (0.02) WB-LTR (0.01) NB-LTR (0.03) SB-LTR (0.13)
Fox Farm Road	Unsignalized	B (11)	EB-TR (0.16) WB-TL (0.00) NB-LR (0.01)	B (12)	EB-TR (0.25) WB-TL (0.01) NB-LR (0.01)	B (14)	EB-TR (0.36) WB-TL (0.01) NB-LR (0.03)
Old Second South	Unsignalized	B (14)	EB-LTR (0.00) WB-LTR (0.00) NB-LTR (0.04) SB-LTR (0.03)	C (18)	EB-LTR (0.01) WB-LTR (0.01) NB-LTR (0.16) SB-LTR (0.08)	C (24)	EB-LTR (0.00) WB-LTR (0.01) NB-LTR (0.12) SB-LTR (0.12)
Hwy 400 South Ramp	Unsignalized	B (10)	EB-TL (0.05) WB-T (0.14) WB-R (0.07) SB-LR (0.11)	B (11)	EB-TL (0.06) WB-T (0.19) WB-R (0.07) SB-LR (0.13)	B (12)	EB-TL (0.04) WB-T (0.20) WB-R (0.05) SB-LR (0.16)
Hwy 400 North Ramp	Unsignalized	B (12)	EB-T (0.10) EB-R (0.03) WB-TL (0.01) NB-L (0.10) NB-R (0.11)	C (16)	EB-T (0.15) EB-R (0.06) WB-TL (0.01) NB-L (0.25) NB-R (0.24)	C (16)	EB-T (0.19) EB-R (0.15) WB-TL (0.02) NB-L (0.21) NB-R (0.22)

Notes: 1. The LOS at an unsignalized intersection is defined by the movement with the highest delay under HCM 2000.
2. Critical movements are those with a volume-to-capacity ratio exceeding 0.90 for a signalized intersection or with a LOS of 'E' or 'F' for an unsignalized intersection.

In general, the study area intersections under existing conditions are operating at a good LOS 'C' or better during all study peak hours. There are no critical movements at any of the intersections that were examined.

3.0 SITE-GENERATED TRAFFIC

This section of our assessment describes the SWM operational characteristics and the methodology for site traffic generation, distribution plus assignment.

3.1 SWM Operational Characteristics

Curbside Collection

Currently, the County's weekly curbside collection service, including garbage, blue box recycling and organics, is provided under a contract with Progressive Waste Solutions. Under the current system, garbage and green bin organics are collected in one truck which has two compartments that can house both materials. Blue box recycling materials are collected in a separate truck.

With the commissioning of the MMF in 2019, all curbside collection trucks will travel to the subject facility where garbage, green bin organics and recycling materials will be consolidated by type of waste and then exported for processing or disposal. These trucks, which are privately owned and operated, will return to the yard of their respective service provider for fueling at the end of each day. When the OPF becomes operational in 2021, the green bin materials will stay on site for processing.

Facilities Collection and Fleet

The County also operates eight waste drop-off facilities. Garbage and divertible materials collected at these locations are transferred between sites by the SWM fleet for disposal or processing. It is proposed that the ERRC will house a servicing area for these vehicles that will serve as their home base.

In order to project the number of vehicles destined to the ERRC site from the above-noted facilities, the closure of the County's existing landfill in the Town of Collingwood was considered in our ananlysis. In addition, the current operations for the consolidation and transfer of blue box recycling materials were also applied.

The ERRC will be designed to accommodate the current County needs and future growth. In the interim, there will be potential capacity to accept some green bin organics and recycling from other jurisdictions such as the Cities of Barrie and Orillia. The vehicles from these municipalities were also considered in this study.

3.2 Study Horizon Year

Based on the County's TIS Guidelines plus the opening years of the MMF and OPF, the horizon years of 2021 was selected to represent the opening of the proposed facilities. In addition, horizon years of five and ten years beyond full build-out (2026 and 2031) were also analyzed. Since the commissioning of the OPF is only two years after the MMF, the year 2021 was chosen as one of our study horizons for analysis purposes.

3.3 OPF/MMF Vehicles

As previously indicated, the OPF and MMF in the ERRC are expected to generate external traffic. The types of vehicles which will enter and exit the subject site and their base of operations are summarized in **Table 3.1** based on the following:

- Our understanding of the aforementioned SWM operational characteristics;
- The information from the contracted transfer station in 2015; and
- Anticipated operations at the ERRC according to our consultations with the County.

TABLE 3.1
OPF/MMF VEHICLE TYPES

Facility	Vehicle Category	Type	Base
MMF	1	"County curbside collection trucks (garbage/organics – split trucks)"	Contractor's facility – fueling station located in the City of Barrie
	2	"County curbside collection trucks (recycling paper fibres/containers - split trucks)"	Contractor's facility – fueling station located in the City of Barrie
	3	"Garbage from sites - hauled by SWM fleet"	OPF/MMF (Home Base)
	4	"Recycling from sites - hauled by SWM fleet"	OPF/MMF (Home Base)
	5	"Commercial inbound organics (assume contracted hauler)"	Contractor's facility
	6	"Additional curbside recycling (utilizing available interim capacity, assume collection trucks)"	Contractor's facility
	7	"MMF staff vehicles (MMF staff arriving in personal vehicles includes truck drivers)"	Various
	8	"Outbound curbside collected garbage for export"	Contractor's facility
	9	"Outbound facilities collected garbage for export"	Contractor's facility
	10	"Outbound organics for export - hauled by SWM fleet"	OPF/MMF (Home Base)
	11	"Outbound paper fibres for export"	Contractor's facility
	12	"Outbound containers for export"	Contractor's facility
OPF	13	"Bulking agent (leaf, yard waste and brush) inbound hauled by SWM fleet"	OPF/MMF (Home Base)
	14	"Additional organics (assumes trailers)"	Contractor's facility
	15	"Outbound product hauled by SWM fleet"	OPF/MMF (Home Base)
	16	"OPF staff vehicles"	Various

The schedules of these vehicle trips, such as their first and last arrival and departure, are summarized in **Table 3.2**.

TABLE 3.2
SCHEDULES OF OPF/MMF VEHICLES

Vehicle Category	AM		PM	
	Inbound	Outbound	Inbound	Outbound
1	See "Hourly distribution of inbound curbside garbage in 2015" in **Table 3.3**.			
2	See "Hourly distribution of inbound curbside recycling trucks in 2015" in **Table 3.4**.			
3	Home Base	7 a.m.	Last inbound truck at 4 p.m.	Home Base
4	Home Base	7 a.m.	Last inbound truck at 4 p.m.	Home Base
5	-	-	From 2 to 4 p.m.	Last outbound truck at 4:30 p.m.
6	Given the fact that this is also curbside recycling, it was assumed that it has similar characteristics as County's curbside recycling trucks and they have similar distribution. See Table 4.4.			
7	6:30 a.m.	-	-	4:30 p.m.
8	First inbound truck at 7 a.m.	First outbound truck at 7:15 a.m.	-	Last outbound truck at 2 p.m.
9	First inbound truck at 7 a.m.	First outbound truck at 7:15 a.m.	-	Last outbound truck at 2 p.m.
10	Home Base	7 a.m.	4:30 p.m.	Home Base
11	First inbound truck at 7 a.m.	First outbound truck at 7:15 a.m.	-	Last outbound truck at 2 p.m.
12	First inbound truck at 7 a.m.	First outbound truck at 7:15 a.m.	-	Last outbound truck at 2 p.m.
13	Home Base	7 a.m.	From 2 to 4 p.m.	-
14	-	-	From 2 to 4 p.m.	Last outbound truck at 4:30 p.m.
15	Home Base	7 a.m.	Last inbound truck at 4:30 p.m.	Last outbound truck at 2 p.m.
16	6:30 a.m.	-	-	4:30 p.m.

In addition, we have reviewed the 2015 hourly distribution of the County's curbside collection vehicles. Daily data and monthly summaries from the County's contracted transfer station were examined in detail. It was found that the hourly distributions within a month are generally consistent, and no significant variations were observed. Therefore, monthly summaries were utilized and are presented in **Tables 3.3** and **3.4**, respectively.

TABLE 3.3
2015 HOURLY DISTRIBUTION FROM JANUARY TO DECEMBER
– CURBSIDE GARBAGE AND ORGANICS COLLECTION TRUCKS

	Time		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Garbage Truck	AM	9:00-9:59	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%
		10:00-10:59	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%	1%	1%
		11:00-11:59	1%	1%	1%	0%	1%	1%	2%	1%	0%	1%	0%	1%
	PM	12:00-12:59	2%	1%	2%	2%	2%	2%	4%	2%	2%	1%	1%	2%
		1:00-1:59	3%	6%	10%	8%	7%	8%	8%	4%	4%	4%	5%	6%
		2:00-2:59	17%	24%	30%	21%	15%	14%	13%	13%	12%	11%	14%	16%
		3:00-3:59	37%	36%	44%	39%	35%	25%	26%	20%	21%	33%	25%	36%
		4:00-4:59	30%	30%	14%	27%	34%	38%	29%	35%	42%	36%	33%	26%
		5:00-5:59	9%	3%	1%	1%	6%	11%	13%	17%	15%	12%	18%	9%
		6:00-6:59	1%	0%	0%	0%	1%	1%	5%	8%	3%	2%	3%	2%
	TOTAL		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

**Minor variances are due to rounding.*

Based on the above, the highest percentages, which represent the site-generated peak traffic volumes for the curbside garbage and organics collection trucks, are 2% and 44% for the a.m. and p.m. time periods, respectively.

TABLE 3.4
2015 HOURLY DISTRIBUTION FROM JANUARY TO DECEMBER
– CURBSIDE RECYCLING COLLECTION TRUCKS

	Time		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Recycling Truck	AM	9:00-9:59	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
		10:00-10:59	0%	0%	0%	0%	1%	1%	0%	1%	0%	0%	0%	0%
		11:00-11:59	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	0%	1%
	PM	12:00-12:59	3%	1%	2%	3%	1%	2%	2%	1%	2%	1%	1%	2%
		1:00-1:59	4%	6%	10%	4%	4%	4%	6%	5%	3%	4%	4%	7%
		2:00-2:59	17%	19%	27%	23%	19%	19%	14%	15%	19%	17%	16%	21%
		3:00-3:59	26%	29%	39%	25%	24%	21%	20%	18%	18%	29%	37%	30%
		4:00-4:59	29%	31%	22%	35%	37%	33%	32%	32%	36%	34%	25%	23%
		5:00-5:59	14%	10%	0%	8%	10%	18%	19%	20%	18%	11%	13%	12%
		6:00-6:59	6%	2%	0%	0%	2%	1%	5%	7%	1%	2%	5%	4%
	TOTAL		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

**Minor variances are due to rounding.*

As shown above, the highest percentages for the curbside recycling trucks are 1% and 39% for the a.m. and p.m. time periods, respectively. It should be noted that the above-noted

peaks and the roadway peaks may not coincide. However, to be conservative, we added these trips to both the weekday a.m. and p.m. roadway peaks.

3.4 Trip Generation

The future projected daily loads for each category of the trucks outlined in Table 3.1 were provided by the County and are included in **Appendix D**. These loads were developed based on population growth within the County and the associated waste generation estimates.

The existing TMCs at the study intersections indicate that the roadway peak hours during the a.m. and p.m. periods are generally within the range of 10 a.m. to noon and 4 to 6 p.m., respectively. Based on this information, the projected daily loads included in Appendix D plus the findings in Section 3.3 illustrate the site-generated peak hour traffic as summarized in **Table 3.5**. The detailed explanatory notes are included in Appendix D.

TABLE 3.5
SITE-GENERATED PEAK HOUR TRAFFIC

Vehicle Category		2021				2026				2031				2049			
		A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		A.M.		P.M.	
		IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
MMF	*1*	1	1	18	18	1	1	20	20	1	1	22	22	1	1	31	31
	2	0	0	15	15	0	0	17	17	1	1	19	19	1	1	27	27
	3	-	-	-	-	5	-	-	-	5	-	-	-	9	-	-	-
	4	2	-	-	-	2	-	-	-	3	-	-	-	4	-	-	-
	5	-	-	-	2	-	-	-	2	-	-	-	3	-	-	-	4
	6	-	-	8	8	-	-	9	9	-	-	11	11	-	-	-	-
	7	-	-	-	15	-	-	-	16	-	-	-	17	-	-	-	20
	8	5	5	-	-	5	5	-	-	6	6	-	-	10	10	-	-
	9	-	-	-	-	2	2	-	-	2	2	-	-	4	4	-	-
	10	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
	11	6	6	-	-	8	8	-	-	9	9	-	-	10	10	-	-
OPF	*12*	6	6	-	-	7	7	-	-	8	8	-	-	9	9	-	-
	13	-	3	-	-	-	3	-	-	-	3	-	-	-	3	-	-
	14	-	-	-	2	-	-	-	1	-	-	-	1	-	-	-	-
	15	-	3	3	-	-	3	3	-	-	3	3	-	-	3	3	-
	16	-	-	-	5	-	-	-	5	-	-	-	5	-	-	-	5
TOTAL		**20**	**25**	**45**	**65**	**30**	**29**	**49**	**70**	**35**	**33**	**55**	**78**	**48**	**41**	**61**	**87**

**Minor variances are due to rounding.*

Based on our discussions with the County, the design capacity of this facility for the 30-year horizon (2049) has been conservatively applied to the 2026 and 2031 horizons.

3.5 Trip Distribution and Assignment

Since the site traffic consists of different types of vehicles, their distributions are varied. Some of them are also variable by day, particularly for curbside collection trucks. As a result,

multiple scenarios exist. However, it is not necessary to study them all based on the nature of the TIS since the analysis of a worst case scenario is proposed for this site. Therefore, based on the information received from the County and our series of discussions with staff, the site traffic distributions at the site access for this scenario are summarized in **Table 3.6**.

TABLE 3.6
TRAFFIC DISTRIBUTION AT THE SITE ACCESS

Vehicle Category	A.M. PEAK		P.M. PEAK		NOTES
	IN	OUT	IN	OUT	
Staff Vehicles (Categories 7 and 16)	70% from the east on County Road 22 (from Hwy 400); 30% from the west on County Road 22.	-	-	70% to the east on County Road 22 (to Hwy 400); 30% to the west on County Road 22.	-
Other Trucks	95% from the west on County Road 22; 5% from the east on County Road 22 (from Hwy 400).	100% to the east on County Road 22 (to Hwy 400); 0% to the west on County Road 22.	95% from the west on County Road 22; 5% from the east on County Road 22 (from Hwy 400).	100% to the east on County Road 22 (to Hwy 400); 0% to the west on County Road 22.	This scenario would assign the highest left turning volumes for vehicles either entering or exiting the site relative to the other scenarios. Since left turn volumes usually have the greatest impact on traffic conditions at an intersection when compared to other movements these distributions represent the "worst case scenario".

Figure 3.1 illustrates the location of the gateways to which site-generated traffic was assigned to enter and exit the study area. The projected trip distribution was then developed based on the results outlined in Table 3.6 plus existing traffic patterns. The distributions are summarized in **Table 3.7**.

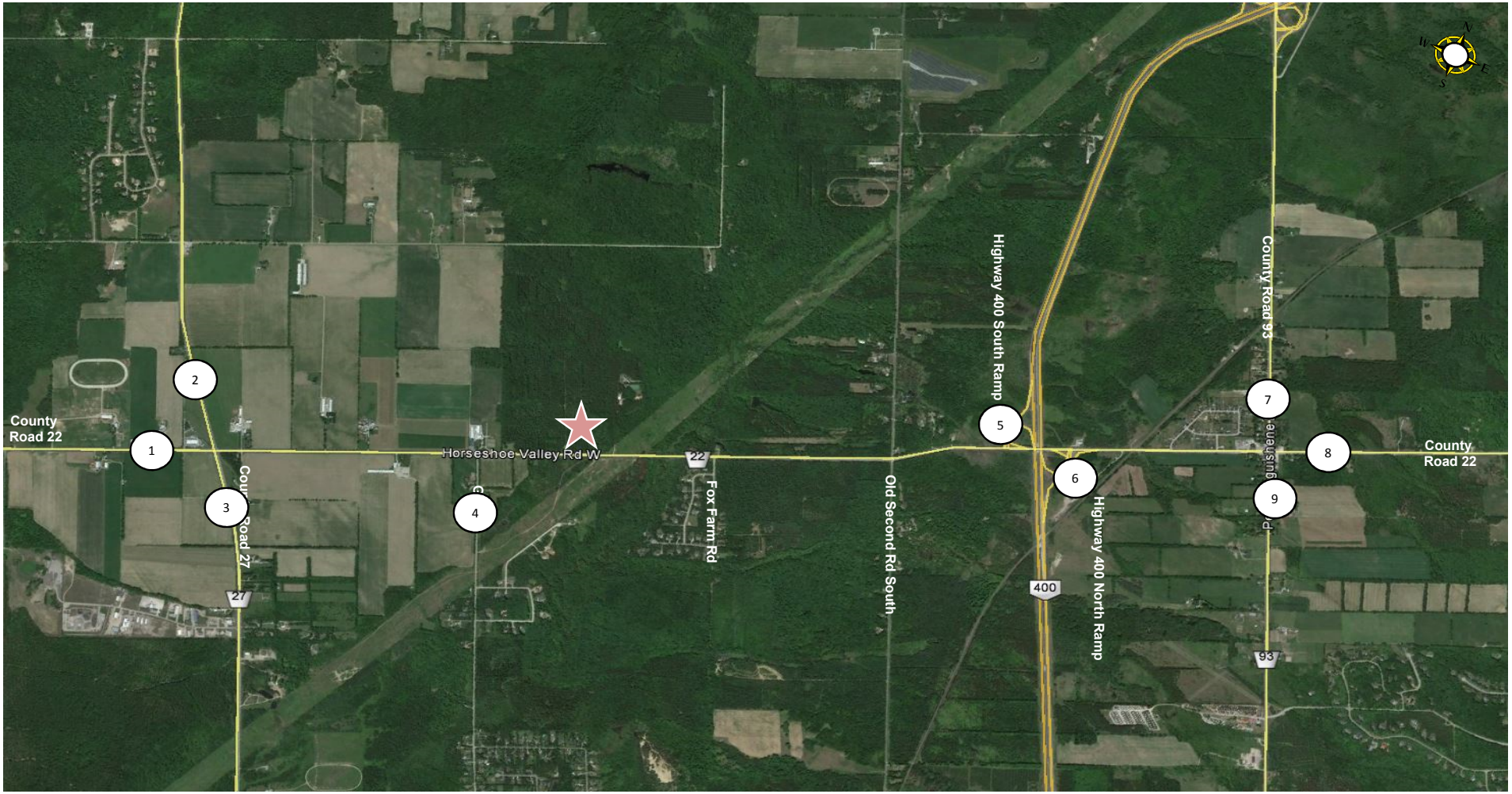


*Figure Not to Scale

WSP | MMM GROUP

LEGEND

(#) Gateway Locations

Proposed Site

FIGURE 3.1
Gateway Locations

TABLE 3.7
TRIP DISTRIBUTIONS AT GATEWAYS

Gateway Number	Location of Gateway	Staff Vehicles				Other Trucks			
		A.M. Peak		P.M. Peak		A.M. Peak		P.M. Peak	
		Inbound	Outbound	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
1	County Road 22 (W. of County Road 27)	N/A	N/A	N/A	12%	50%	0%	55%	0%
2	County Road 27 (N. of County Road 22)	N/A	N/A	N/A	5%	18%	0%	16%	0%
3	County Road 27 (S. of County Road 22)	N/A	N/A	N/A	3%	22%	0%	24%	0%
4	Gill Road (S of County Road 22)	N/A	N/A	N/A	10%	5%	0%	0%	0%
5	Hwy 400 South Ramp (S. of Hwy 400)	N/A	N/A	N/A	0%	0%	100%	0%	100%
6	Hwy 400 North Ramp (N. of Hwy 400)	N/A	N/A	N/A	67%	5%	0%	5%	0%
7	County Road 93 (N. of County Road 22)	N/A	N/A	N/A	0%	0%	0%	0%	0%
8	County Road 22 (E. of County Road 93)	N/A	N/A	N/A	4%	0%	0%	0%	0%
9	County Road 93 (S. of County Road 22)	N/A	N/A	N/A	0%	0%	0%	0%	0%
TOTAL		**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

**Minor variances are due to rounding.*

The site traffic assignment was developed based on the most logical path for vehicles in order to minimize travel time and distance. The site-generated trips are illustrated in **Figures 3.2** to **3.5**.

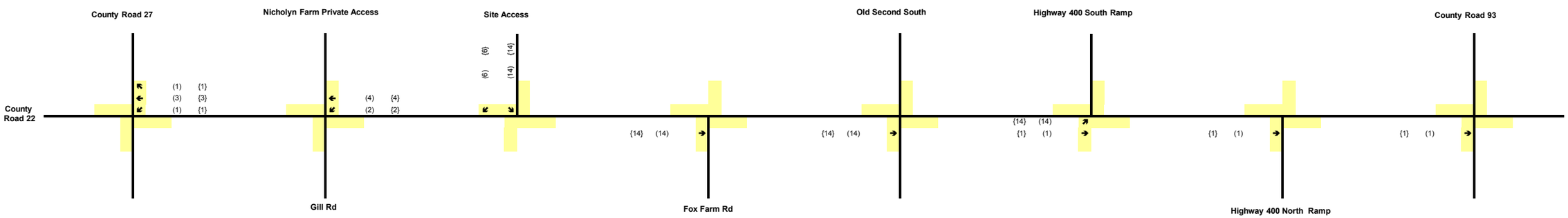


*Figure Not to Scale

LEGEND

XX Weekday AM Peak Hour Volumes
(XX) Weekday PM Peak Hour Volumes
{XX} Friday PM Peak Hour Volumes

FIGURE 3.2

Site-Generated Trips for Staff - 2021 Horizon

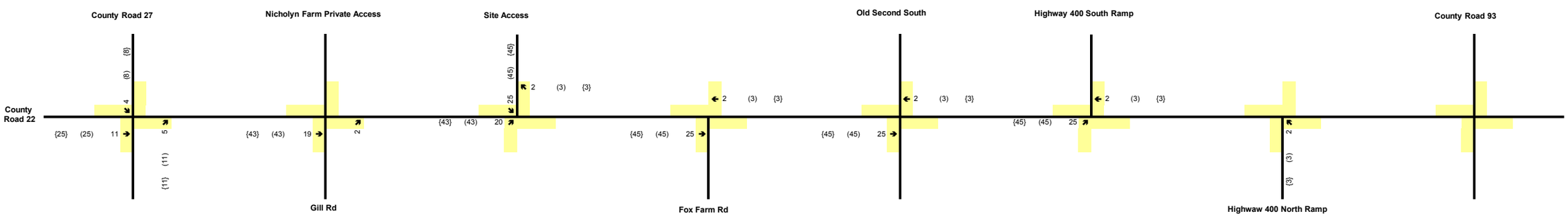


*Figure Not to Scale

LEGEND

XX	Weekday AM Peak Hour Volumes
(XX)	Weekday PM Peak Hour Volumes
{XX}	Friday PM Peak Hour Volumes

FIGURE 3.3

Site-Generated Trips for Trucks - 2021 Horizon

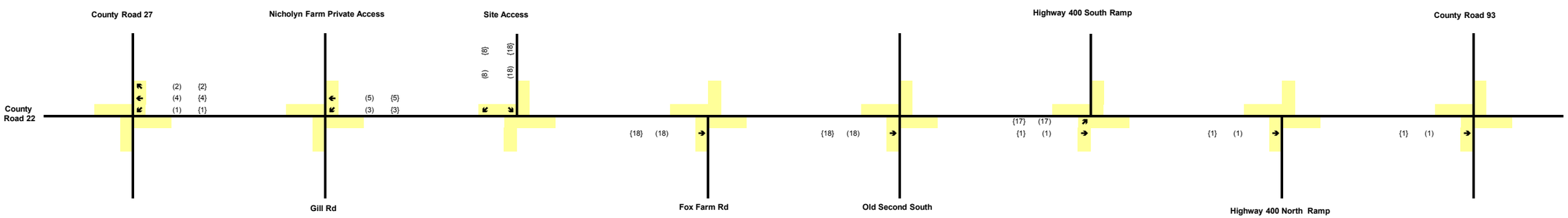


*Figure Not to Scale

LEGEND

XX	Weekday AM Peak Hour Volumes
(XX)	Weekday PM Peak Hour Volumes
{XX}	Friday PM Peak Hour Volumes

FIGURE 3.4

Site-Generated Trips for Staff - 2026 & 2031 Horizons

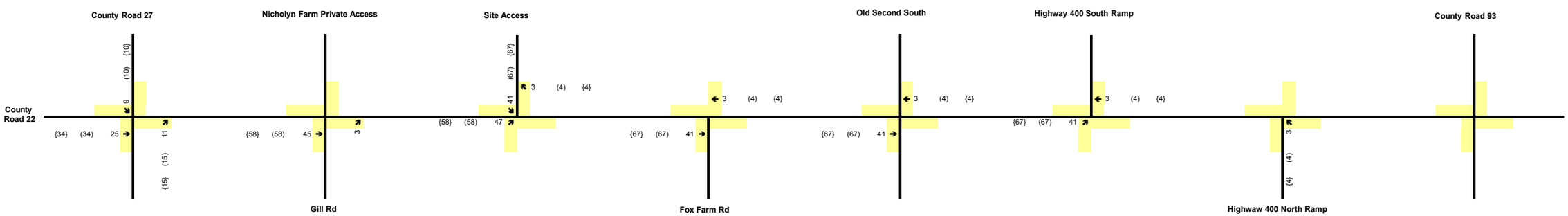


*Figure Not to Scale

WSP | MMM GROUP

LEGEND

XX	Weekday AM Peak Hour Volumes
(XX)	Weekday PM Peak Hour Volumes
{XX}	Friday PM Peak Hour Volumes

FIGURE 3.5

Site-Generated Trips for Trucks - 2026 & 2031 Horizon

4.0 FUTURE CONDITIONS

This section of our assessment describes the method of deriving future background traffic, the future road network, plus the results of our future background and total future traffic analysis within the study area.

4.1 Future Road Network

There are no road improvements identified in the study area and, therefore, the existing lane configurations were utilized for all future horizons.

4.2 Future Background Growth

Based on the available seasonal ADT data during the most recent five years provided by the County, the calculated annual growth rates on County Road 22 within the study area are summarized in **Table 4.1**.

TABLE 4.1
ANNUAL GROWTH RATE CALCULATION

Segment of County Road 22	Year / Season	2011 ADT	2014 ADT	Annual Growth Rate
County Road 93 to Highway 400	Summer	6832	6719	-1%
Highway 400 to County Road 27	Summer	6952	6700	-1%

As noted previously, weekday a.m. and p.m. peak hours during the summer were analyzed since they represent the busiest time of year within the area. Summer traffic volumes have decreased between 2011 and 2014, indicating that no positive growth was observed during this season on the relevant segments of County Road 22. However, to be conservative, we propose to utilize a 1.0% annual growth rate, and apply it to the through movements on County Road 22. Given that the ADT data is not available for the other roads in the area, the same growth rate will also be assumed on these road links.

This growth rate is also consistent with the ones utilized in the “County Road 22 Intersection Improvements at 3rd Line and 4th Line Traffic Impact Study” by Ainley Group dated October 2013, as well as the “Midhurst Secondary Plan Class Environmental Assessment – DRAFT Traffic Operational Analysis” by Ainley Group dated August 2016. Both of these projects are in the vicinity of our study area.

The relevant ADT data and referenced excerpts are included in **Appendix E**.

4.3 Future Background Developments

Background development information was provided by the County, development stakeholders through the Township of Oro-Medonte for the Horseshoe Craighurst Secondary Areas (HCSA), the Master Servicing Plan process, the Midhurst Secondary Areas (MSA) plus other proposed and potential developments in the vicinity of the study area. The locations of these developments and their relevance to the subject site are shown in **Figure 4.1**. The coloured parcels represent different background developments. The relevant excerpts that were referenced in our study are included in **Appendix E**.

The primary route choice of the traffic generated by the developments which are outlined by the dashed circle on Figure 4.1 is expected to be outside of our study area for the following reasons:

- Russell Road and Forbes Road provide options to access Highway 400 via the interchange with this roadway;
- For the eastbound and westbound traffic, Highway 26 and Russell Road/Forbes Road are expected to be their primary choice; and
- The northbound traffic on County Road 27 is expected by very minimal. This would be captured by our previously assumed 1.0% annual growth rate.

Based on the above, it is our opinion that the traffic from the developments noted by the dashed circle on Figure 4.1 would have a negligible impact on our study area and does need to be included in our study as background traffic. Consequently, the trip generation of the background developments included in this study are summarized in **Table 4.2.** The rates contained in the *Institute of Transportation Engineers (ITE) Trip Generation Manual, 9th Edition,* were utilized unless otherwise indicated.

TABLE 4.2
TRIP GENERATION FOR BACKGROUND DEVELOPMENTS

Background Development No.	Horizon Year	Use	Number of Units or Gross Floor Area in ft^2 or Number of Employees	Generated Trips			
				AM		PM	
				Inbound	Outbound	Inbound	Outbound
1	2021	Condo / Townhouses	449	45	223	213	105
		Recreational Homes	250	27	13	27	38
		Hotel	212	47	18	38	51
		Sub-total		**119**	**254**	**278**	**194**
2	2021	Townhouses	1089	81	397	380	216
		Single-Family Detached Housing	450	85	254	283	167

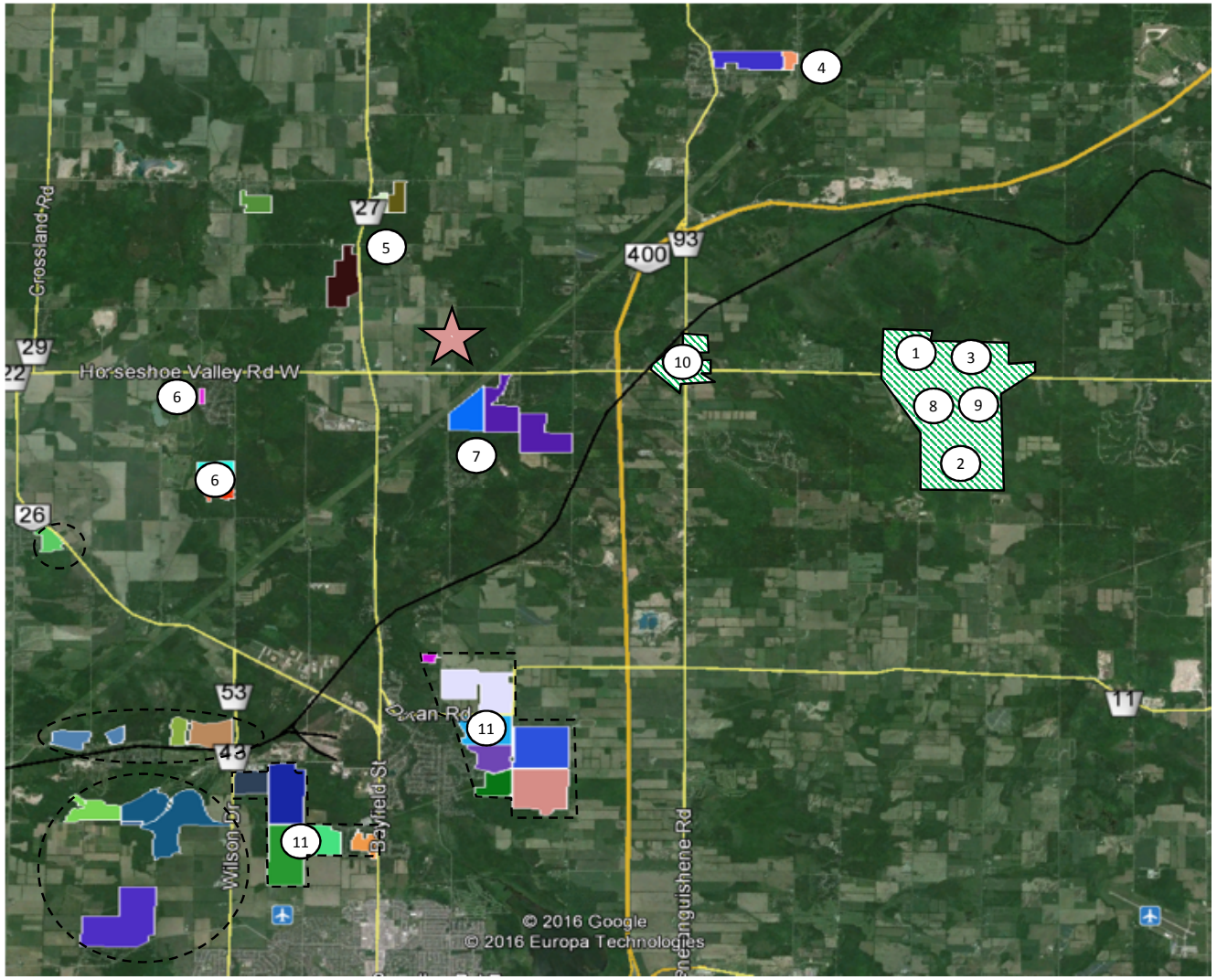


*Figure Not to Scale

WSP | MMM GROUP

LEGEND

- Site
- XX — Background development No.
- Horseshoe Craighurst Areas
- Midhurst
- Other developments which were not considered in this study

FIGURE 4.1
Location of Background Developments

Background Development No.	Horizon Year	Use	Number of Units or Gross Floor Area in ft^2 or Number of Employees	Generated Trips			
				AM		PM	
				Inbound	Outbound	Inbound	Outbound
		Sub-total		**166**	**651**	**663**	**383**
3	2021	Commercial	192,000	**115**	**70**	**342**	**370**
4	2021	Condo / Townhouses	127	9	46	44	22
		Single-Family Detached Housing	361	68	203	227	134
		Sub-total		**77**	**249**	**271**	**156**
5	2021	Single-Family Detached Housing	70	**13**	**39**	**44**	**26**
6	2021	Single-Family Detached Housing	16	**3**	**9**	**10**	**6**
7	2021	Single-Family Detached Housing	28	5	16	18	10
	2031	Single-Family Detached Housing	480	90	270	302	178
		Condo / Townhouses	320	24	117	111	55
		Sub-total		**119**	**403**	**431**	**243**
8	2026	Condo / Townhouses	796	59	290	276	136
		Single-Family Detached Housing	52	10	29	33	19
		Sub-total		**69**	**319**	**309**	**155**
9	2031	Condo / Townhouses	37	**3**	**14**	**13**	**6**
10	2031	Condo / Townhouses	175	13	64	61	30
		Single-Family Detached Housing	525	98	295	331	194
	2031	**Sub-total**		**111**	**359**	**392**	**224**
11*	2031	Residential, Employment and Commercial	8,208 units, 3,120 employees and 495,000ft^2 GFA for commercial	2117	4087	4403	3439
TOTAL				**2912**	**6454**	**7156**	**5202**

** Traffic included in the "Midhurst Secondary Plan Class Environmental Assessment – DRAFT Traffic Operational Analysis" by Ainley Group dated August 2016is directly referenced.*

The trip distributions of the above-noted developments were derived based on their location, land use type and the existing travel patterns in conjunction with the characteristics of the boundary road network. Detailed assumptions are included in **Appendix E**. The related traffic from these developments is shown in **Figures 4.2** to **4.4**.

4.4 Future Background Traffic Conditions

The projected future background traffic volumes consist of existing traffic volumes with applicable growth rates applied to the through movements on specific corridors, in addition to trips generated by the aforementioned background developments. The future background peak hour traffic volumes are presented in **Figures 4.5** to **4.7**. The signal timing and phasing structures for all signalized intersections have been optimized. The future background traffic conditions are summarized in **Table 4**. Detailed capacity sheets are included in **Appendix F.**

TABLE 4.3
INTERSECTION CAPACITY ANALYSIS
FUTURE BACKGROUND TRAFFIC CONDITIONS

Intersections with County Road 22	Control Type	Horizons	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour		Friday P.M. Peak Hour	
			LOS (Delay) in Seconds	Critical Movements In Bold (v/c)	LOS (Delay) in Seconds	Critical Movements In Bold (v/c)	LOS (Delay) in Seconds	Critical Movements In Bold (v/c)
County Road 27	Signalized	2021	B (18)	EB-L (0.11) EB-TR (0.26) WB-LTR (0.69) NB-L (0.09) NB-TR (0.44) SB-L (0.30) SB-T (0.61) SB-R (0.08)	C (20)	EB-L (0.16) EB-TR (0.49) WB-LTR (0.76) NB-L (0.07) NB-TR (0.58) SB-L (0.53) SB-T (0.66) SB-R (0.07)	C (23)	EB-L (0.16) EB-TR (0.67) WB-LTR (0.82) NB-L (0.09) NB-TR (0.65) SB-L (0.63) SB-T (0.50) SB-R (0.13)
		2026	C (21)	EB-L (0.11) EB-TR (0.26) WB-LTR (0.79) NB-L (0.11) NB-TR (0.52) SB-L (0.38) SB-T (0.72) SB-R (0.09)	C (23)	EB-L (0.17) EB-TR (0.54) **WB-LTR (0.86)** NB-L (0.08) NB-TR (0.61) SB-L (0.68) SB-T (0.67) SB-R (0.07)	C (30)	EB-L (0.16) EB-TR (0.65) **WB-LTR (0.89)** NB-L (0.10) NB-TR (0.66) **SB-L (0.87)** SB-T (0.49) SB-R (0.13)
		2031	D (42)	EB-L (0.15) EB-TR (0.33) **WB-LTR (1.00)** NB-L (0.33) NB-TR (0.69) SB-L (0.67) **SB-T (0.95)** SB-R (0.09)	F (111)	EB-L (0.20) EB-TR (0.65) **WB-LTR (1.45)** NB-L (0.35) **NB-TR (1.06)** **SB-L (1.19)** **SB-T (0.98)** SB-R (0.06)	F (152)	EB-L (0.19) EB-TR (0.80) **WB-LTR (1.77)** NB-L (0.35) **NB-TR (1.21)** **SB-L (1.18)** **SB-T (0.89)** SB-R (0.11)

Intersections with County Road 22	Control Type	Horizons	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour		Friday P.M. Peak Hour	
			LOS (Delay) in Seconds	Critical Movements In Bold (v/c)	LOS (Delay) in Seconds	Critical Movements In Bold (v/c)	LOS (Delay) in Seconds	Critical Movements In Bold (v/c)
County Road 93	Signalized	2021	B (15)	EB-L (0.11) EB-TR (0.46) WB-L (0.11) WB-TR (0.71) NB-L (0.18) NB-TR (0.16) SB-L (0.11) SB-TR (0.12)	B (18)	EB-L (0.28) EB-TR (0.83) WB-L (0.31) WB-TR (0.73) NB-L (0.08) NB-TR (0.38) SB-L (0.18) SB-TR (0.19)	C (21)	EB-L (0.24) **EB-TR (0.90)** WB-L (0.36) WB-TR (0.73) NB-L (0.18) NB-TR (0.36) SB-L (0.19) SB-TR (0.15)
		2026	C (28)	EB-L (0.23) EB-TR (0.52) WB-L (0.16) **WB-TR (0.97)** NB-L (0.18) NB-TR (0.17) SB-L (0.12) SB-TR (0.12)	C (26)	EB-L (0.34) **EB-TR (0.95)** WB-L (0.53) WB-TR (0.80) NB-L (0.09) NB-TR (0.47) SB-L (0.29) SB-TR (0.21)	C (22)	EB-L (0.21) **EB-TR (0.90)** WB-L (0.50) WB-TR (0.71) NB-L (0.23) NB-TR (0.51) SB-L (0.36) SB-TR (0.19)
		2031	C (25)	EB-L (0.51) EB-TR (0.56) WB-L (0.23) **WB-TR (0.94)** NB-L (0.27) NB-TR (0.26) SB-L (0.39) SB-TR (0.42)	D (38)	**EB-L (1.13)** **EB-TR (0.96)** WB-L (0.80) **WB-TR (0.88)** NB-L (0.12) NB-TR (0.66) SB-L (0.78) SB-TR (0.39)	E (65)	EB-L (0.78) **EB-TR (1.06)** WB-L (0.55) **WB-TR (1.00)** NB-L (0.34) **NB-TR (0.85)** SB-L (0.77) SB-TR (0.32)
Gill Road	Unsignalized	2021	C (19)	EB-LTR (0.01) WB-LTR (0.01) NB-LTR (0.04) SB-LTR (0.07)	C (25)	EB-LTR (0.01) WB-LTR (0.02) NB-LTR (0.12) SB-LTR (0.14)	D (33)	EB-LTR (0.02) WB-LTR (0.01) NB-LTR (0.05) SB-LTR (0.23)
		2026	C (24)	EB-LTR (0.01) WB-LTR (0.01) NB-LTR (0.06) SB-LTR (0.09)	D (32)	EB-LTR (0.01) WB-LTR (0.02) NB-LTR (0.15) SB-LTR (0.18)	E (44)	EB-LTR (0.02) WB-LTR (0.01) NB-LTR (0.07) **SB-LTR (0.31)**
		2031	D (33)	EB-LTR (0.01) WB-LTR (0.01) NB-LTR (0.08) SB-LTR (0.14)	F (59)	EB-LTR (0.02) WB-LTR (0.02) NB-LTR (0.26) **SB-LTR (0.31)**	F (104)	EB-LTR (0.03) WB-LTR (0.02) NB-LTR (0.12) **SB-LTR (0.55)**
Fox Farm Road	Unsignalized	2021	B (13)	EB-TR (0.22) WB-TL (0.01) NB-LR (0.04)	C (16)	EB-TR (0.38) WB-TL (0.02) NB-LR (0.03)	C (21)	EB-TR (0.50) WB-TL (0.02) NB-LR (0.07)
		2026	C (15)	EB-TR (0.24) WB-TL (0.01) NB-LR (0.04)	C (19)	EB-TR (0.45) WB-TL (0.02) NB-LR (0.03)	C (25)	EB-TR (0.57) WB-TL (0.02) NB-LR (0.08)
		2031	D (29)	EB-TR (0.28) WB-TL (0.04) NB-LR (0.55)	F (103)	EB-TR (0.58) WB-TL (0.19) **NB-LR (0.82)**	F (278)	EB-TR (0.71) WB-TL (0.22) **NB-LR (1.28)**

Intersections with County Road 22	Control Type	Horizons	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour		Friday P.M. Peak Hour	
			LOS (Delay) in Seconds	Critical Movements In Bold (v/c)	LOS (Delay) in Seconds	Critical Movements In Bold (v/c)	LOS (Delay) in Seconds	Critical Movements In Bold (v/c)
Old Second South	Unsignalized	2021	C (19)	EB-LTR (0.00) WB-LTR (0.00) NB-LTR (0.07) SB-LTR (0.05)	D (32)	EB-LTR (0.01) WB-LTR (0.01) NB-LTR (0.28) SB-LTR (0.15)	E (47)	EB-LTR (0.00) WB-LTR (0.01) NB-LTR (0.21) **SB-LTR (0.23)**
		2026	C (23)	EB-LTR (0.00) WB-LTR (0.00) NB-LTR (0.08) SB-LTR (0.07)	E (44)	EB-LTR (0.01) WB-LTR (0.01) **NB-LTR (0.36)** SB-LTR (0.21)	F (72)	EB-LTR (0.00) WB-LTR (0.01) NB-LTR (0.28) **SB-LTR (0.33)**
		2031	D (35)	EB-LTR (0) WB-LTR (0) NB-LTR (0.14) SB-LTR (0.11)	F (127)	EB-LTR (0.02) WB-LTR (0.01) **NB-LTR (0.70)** SB-LTR (0.46)	F (267)	EB-LTR (0.01) WB-LTR (0.01) NB-LTR (0.54) **SB-LTR (0.78)**
Hwy 400 South Ramp	Unsignalized	2021	B (12)	EB-TL (0.06) WB-T (0.25) WB-R (0.12) SB-LR (0.19)	B (14)	EB-TL (0.10) WB-T (0.29) WB-R (0.10) SB-LR (0.22)	C (17)	EB-TL (0.08) WB-T (0.30) WB-R (0.08) SB-LR (0.28)
		2026	B (14)	EB-TL (0.07) WB-T (0.33) WB-R (0.15) SB-LR (0.23)	C (17)	EB-TL (0.11) WB-T (0.33) WB-R (0.11) SB-LR (0.27)	C (22)	EB-TL (0.08) WB-T (0.34) WB-R (0.09) SB-LR (0.36)
		2031	C (19)	EB-TL (0.09) WB-T (0.42) WB-R (0.19) SB-LR (0.31)	D (30)	EB-TL (0.12) WB-T (0.44) WB-R (0.14) SB-LR (0.49)	F (50)	EB-TL (0.10) WB-T (0.45) WB-R (0.11) **SB-LR (0.66)**
Hwy 400 North Ramp	Unsignalized	2021	C (18)	EB-T (0.15) EB-R (0.04) WB-TL (0.01) NB-L (0.16) NB-R (0.18)	D (30)	EB-TL (0.12) WB-T (0.44) WB-R (0.14) SB-LR (0.49)	D (31)	EB-T (0.30) EB-R (0.15) WB-TL (0.03) NB-L (0.40) NB-R (0.50)
		2026	D (25)	EB-T (0.17) EB-R (0.04) WB-TL (0.02) NB-L (0.23) NB-R (0.2)	F (51)	EB-T (0.32) EB-R (0.06) WB-TL (0.03) **NB-L (0.61)** NB-R (0.69)	E (42)	EB-T (0.37) EB-R (0.15) WB-TL (0.04) **NB-L (0.55)** NB-R (0.71)
		2031	E (49)	EB-T (0.24) EB-R (0.05) WB-TL (0.03) **NB-L (0.39)** NB-R (0.28)	F (227)	EB-T (0.44) EB-R (0.07) WB-TL (0.05) **NB-L (1.33)** **NB-R (1.03)**	F (259)	EB-T (0.49) EB-R (0.16) WB-TL (0.05) **NB-L (1.25)** **NB-R (1.08)**

Notes: 1. The LOS at an unsignalized intersection is defined by the movement with the highest delay under HCM 2000.
2. Critical movements are those with a volume-to-capacity ratio exceeding 0.90 for a signalized intersection or with a LOS of 'E' or 'F' for an unsignalized intersection.

Under the 2021 and 2026 future background conditions, the majority of the study area intersections are expected to continue operating at a reasonable LOS 'E' or better during all study peak hours. One exception is the shared northbound left/through/right movement (NB-LTR) at the Old Second South intersection which has a LOS of 'F' during the Friday p.m. peak period. However, the v/c ratio of 0.33 indicates that ample reserve capacity will be available on this approach. All of the critical movements identified will still operate within the available roadway capacity.

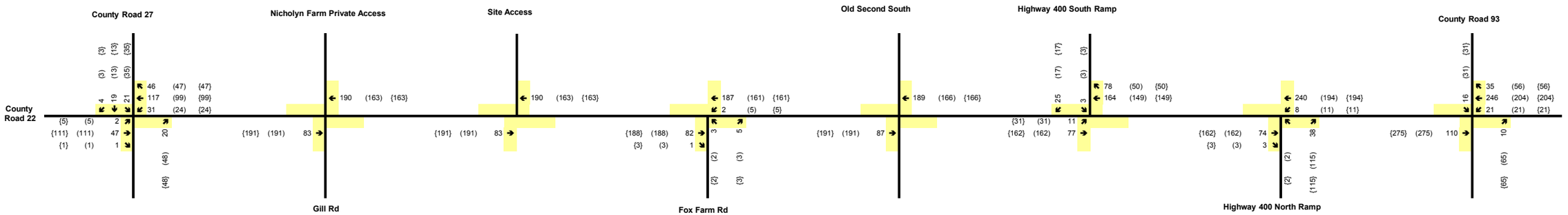


*Figure Not to Scale

LEGEND

XX	Weekday AM Peak Hour Volumes
(XX)	Weekday PM Peak Hour Volumes
{XX}	Friday PM Peak Hour Volumes

FIGURE 4.2

Background Development Traffic Volumes - 2021 Horizon

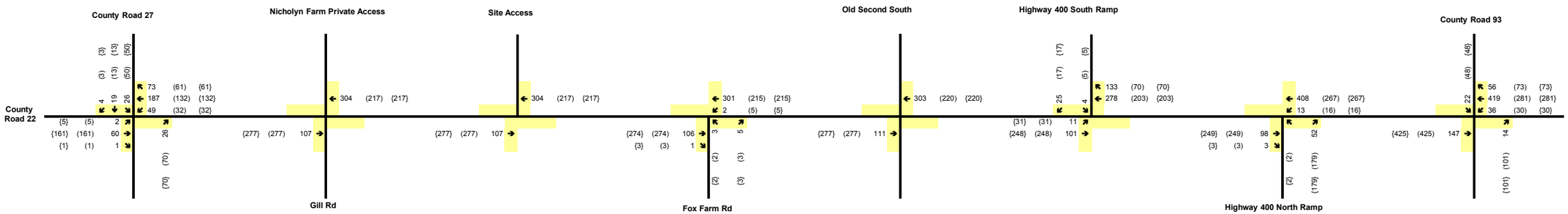


*Figure Not to Scale

LEGEND

XX Weekday AM Peak Hour Volumes
(XX) Weekday PM Peak Hour Volumes
{XX} Friday PM Peak Hour Volumes

FIGURE 4.3

Background Development Traffic Volumes - 2026 Horizon

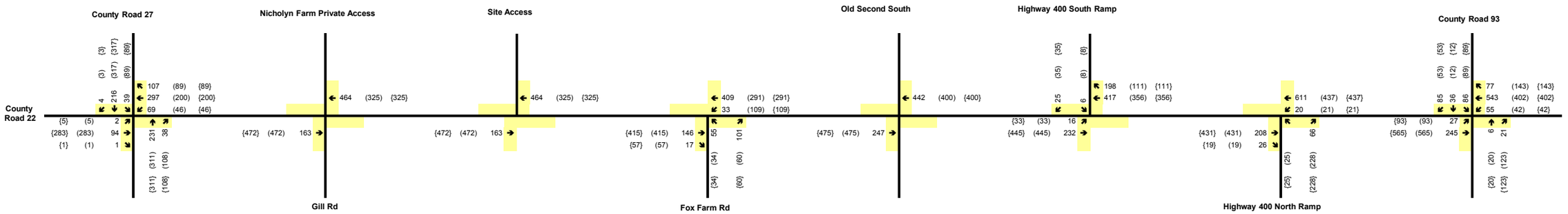


*Figure Not to Scale

LEGEND

XX Weekday AM Peak Hour Volumes
(XX) Weekday PM Peak Hour Volumes
{XX} Friday PM Peak Hour Volumes

FIGURE 4.4

Background Development Traffic Volumes - 2031 Horizon

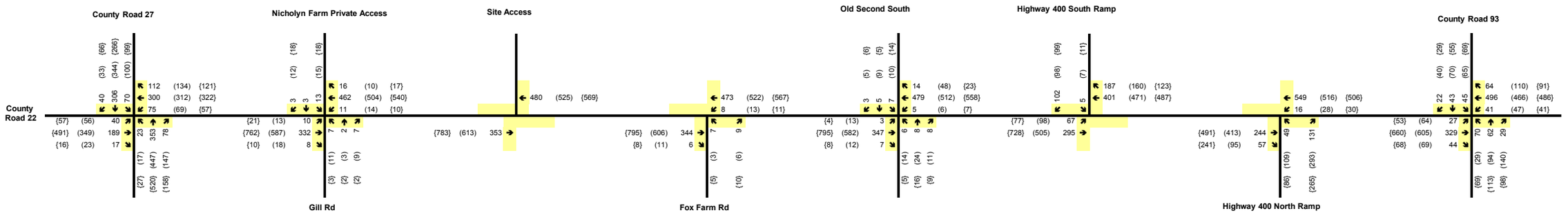


*Figure Not to Scale

LEGEND

XX	Weekday AM Peak Hour Volumes
(XX)	Weekday PM Peak Hour Volumes
{XX}	Friday PM Peak Hour Volumes

WSP | MMM GROUP

FIGURE 4.5

Future Background Traffic Conditions - 2021 Horizon

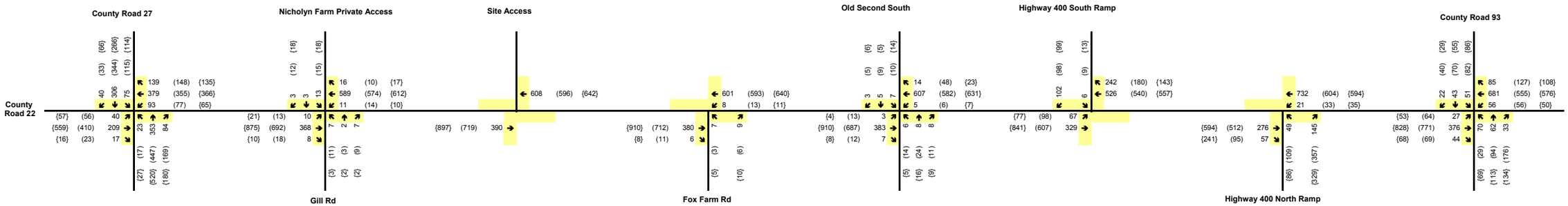


*Figure Not to Scale

LEGEND

XX	Weekday AM Peak Hour Volumes
(XX)	Weekday PM Peak Hour Volumes
{XX}	Friday PM Peak Hour Volumes

FIGURE 4.6

Future Background Traffic Conditions - 2026 Horizon

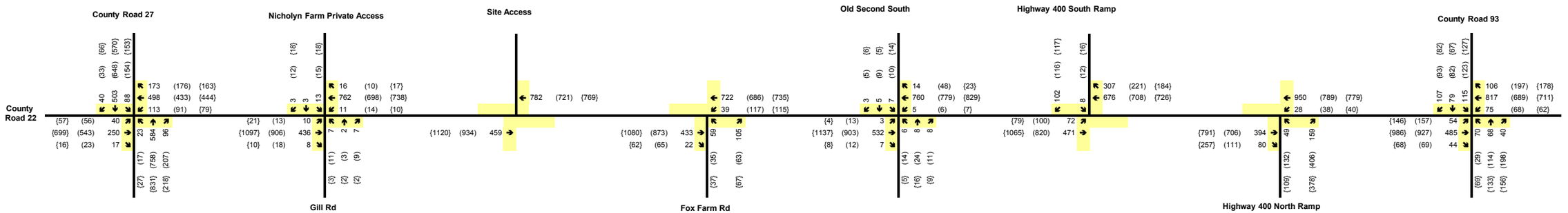


*Figure Not to Scale

LEGEND

XX Weekday AM Peak Hour Volumes
(XX) Weeday PM Peak Hour Volumes
{XX} Friday PM Peak Hour Volumes

FIGURE 4.7

Future Background Traffic Conditions - 2031 Horizon

As for the 2031 future background conditions, all of the study area intersections are expected to continue operating at LOS 'E' or better during the a.m. peak hour. For the weekday p.m. peak hour, the County Road 27 intersection has a LOS of 'F' and a few critical movements will be over capacity. At the majority of unsignalized intersections, movements with LOS 'F' were identified and several of them are over capacity, such as the northbound left turn (NB-L) and northbound right turn (NB-R) movements at the Highway 400 North Ramp intersection. It should be noted that in general, the Friday p.m. peak hour is busier than the weekday p.m. peak, and a few critical movements at the County Road 27 and County Road 93 intersections will be over capacity. At the unsignalized intersections, several movements have a LOS of 'F', and a few of them are over capacity.

It should be noted that these traffic conditions are a result of background traffic growth without the site-generated traffic. It is also noteworthy that the background developments assumed in this study include approved, "under review" and potential applications with optimistic site statistics being used for conservative infrastructure planning purposes. This is a significant assumption which indicates that the results are very conservative. In addition, typical study horizons for a TIS are five and 10 years. Future horizons beyond 10 years may be helpful for the purpose of evaluating the site traffic impacts, but the traffic analysis results should be utilized with caution. Therefore, it is our recommendation that traffic conditions within this study area, particularly the County Road 27/22 intersection be monitored through the future traffic studies completed for the Site Plan Applications for these background developments or studies initiated by the County. Accordingly, the need for road improvements should be examined in greater detail during the post 2026 period.

4.5 Total Future Traffic Conditions

The total future traffic volumes were developed by aggregating the following traffic volumes:

- Site-generated traffic volumes (Figures 3.2 to 3.5); and
- Future background traffic volumes (Figures 4.5 to 4.7).

The resulting total future traffic volumes are shown in **Figures 4.8** to **4.10**. Based on the traffic volumes and the existing lane configurations, the total future traffic conditions were assessed and the results are outlined in **Table 4.** Detailed intersection capacity analysis sheets are included in **Appendix G**.

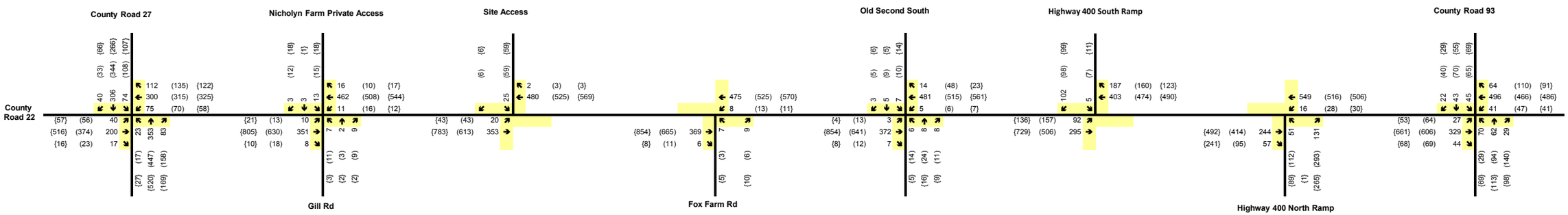


*Figure Not to Scale

LEGEND

XX Weekday AM Peak Hour Volumes
(XX) Weekday PM Peak Hour Volumes
{XX} Friday PM Peak Hour Volumes

WSP | MMM GROUP

FIGURE 4.8

Total Future Traffic Conditions - 2021 Horizon

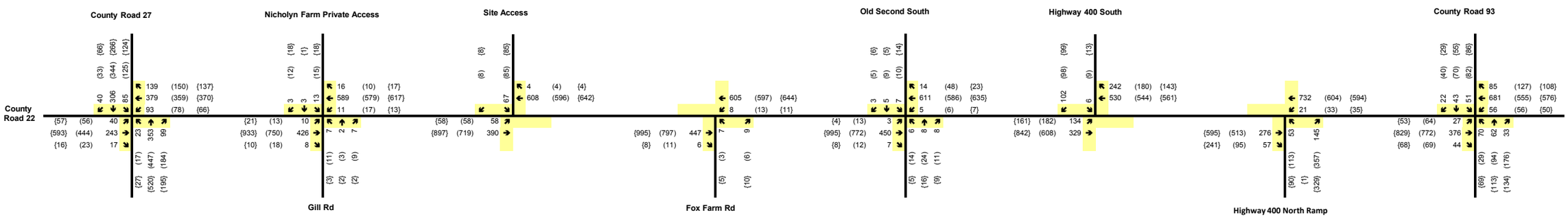


*Figure Not to Scale

LEGEND

XX Weekday AM Peak Hour Volumes
(XX) Weekday PM Peak Hour Volumes
{XX} Friday PM Peak Hour Volumes

FIGURE 4.9

Total Future Traffic Conditions - 2026 Horizon

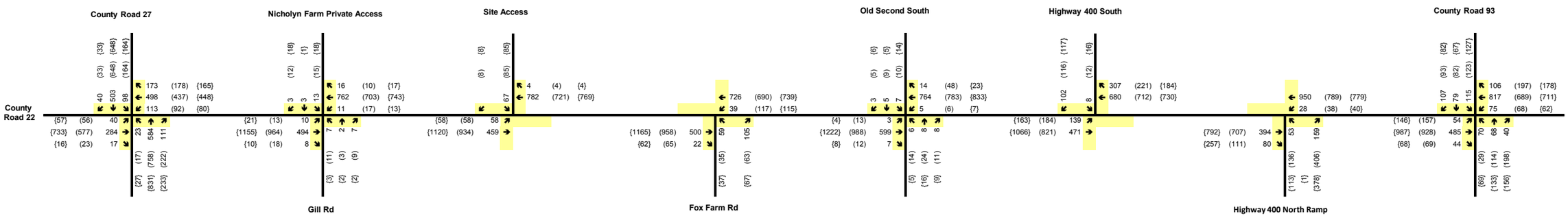


*Figure Not to Scale

LEGEND

XX Weekday AM Peak Hour Volumes
(XX) Weekday PM Peak Hour Volumes
{XX} Friday PM Peak Hour Volumes

FIGURE 4.10

Total Future Traffic Conditions - 2031 Horizon

TABLE 4.4
INTERSECTION CAPACITY ANALYSIS
TOTAL FUTURE TRAFFIC CONDITIONS

Intersections with County Road 22	Control Type	Horizons	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour		Friday P.M. Peak Hour	
			LOS (Delay) in Seconds	Critical Movements In Bold (v/c)	LOS (Delay) in Seconds	Critical Movements In Bold (v/c)	LOS (Delay) in Seconds	Critical Movements In Bold (v/c)
County Road 27	Signalized	2021	B (18)	EB-L (0.11) EB-TR (0.28) WB-LTR (0.69) NB-L (0.09) NB-TR (0.45) SB-L (0.32) SB-T (0.61) SB-R (0.08)	B (20)	EB-L (0.16) EB-TR (0.52) WB-LTR (0.77) NB-L (0.07) NB-TR (0.59) SB-L (0.59) SB-T (0.66) SB-R (0.07)	C (23)	EB-L (0.17) EB-TR (0.70) **WB-LTR (0.87)** NB-L (0.09) NB-TR (0.66) SB-L (0.70) SB-T (0.50) SB-R (0.13)
		2026	C (21)	EB-L (0.11) EB-TR (0.29) WB-LTR (0.80) NB-L (0.11) NB-TR (0.54) SB-L (0.43) SB-T (0.72) SB-R (0.09))	C (26)	EB-L (0.17) EB-TR (0.58) **WB-LTR (0.92)** NB-L (0.08) NB-TR (0.62) SB-L (0.77) SB-T (0.67) SB-R (0.07)	C (34)	EB-L (0.16) EB-TR (0.69) **WB-LTR (0.95)** NB-L (0.10) NB-TR (0.67) **SB-L (0.99)** SB-T (0.49) SB-R (0.13)
		2031	D (43)	EB-L (0.15) EB-TR (0.35) **WB-LTR (1.01)** NB-L (0.33) NB-TR (0.70) SB-L (0.76) **SB-T (0.95)** SB-R (0.09)	F (126)	EB-L (0.20) EB-TR (0.69) **WB-LTR (1.58)** NB-L (0.35) **NB-TR (1.07)** **SB-L (1.27)** **SB-T (0.98)** SB-R (0.06)	F (177)	EB-L (0.19) EB-TR (0.84) **WB-LTR (2.01)** NB-L (0.35) **NB-TR (1.23)** **SB-L (1.26)** **SB-T (0.89)** SB-R (0.11)
County Road 93	Signalized	2021	B (15)	EB-L (0.11) EB-TR (0.46) WB-L (0.11) WB-TR (0.71) NB-L (0.18) NB-TR (0.16) SB-L (0.11) SB-TR (0.12)	B (19)	EB-L (0.28) EB-TR (0.83) WB-L (0.31) WB-TR (0.73) NB-L (0.08) NB-TR (0.38) SB-L (0.18) SB-TR (0.19)	C (22)	EB-L (0.24) **EB-TR (0.90)** WB-L (0.36) WB-TR (0.73) NB-L (0.18) NB-TR (0.36) SB-L (0.19) SB-TR (0.15)
		2026	C (28)	EB-L (0.23) EB-TR (0.52) WB-L (0.16) WB-TR (0.97) NB-L (0.18) NB-TR (0.17) SB-L (0.12) SB-TR (0.12)	C (26)	EB-L (0.34) **EB-TR (0.95)** WB-L (0.53) WB-TR (0.80) NB-L (0.09) NB-TR (0.47) SB-L (0.29) SB-TR (0.21)	C (22)	EB-L (0.21) **EB-TR (0.90)** WB-L (0.50) WB-TR (0.71) NB-L (0.23) NB-TR (0.51) SB-L (0.36) SB-TR (0.19)
		2031	C (25)	EB-L (0.51) EB-TR (0.56) WB-L (0.23) **WB-TR (0.94)** NB-L (0.27) NB-TR (0.26) SB-L (0.39) SB-TR (0.42)	D (38)	**EB-L (1.13)** **EB-TR (0.96)** WB-L (0.80) **WB-TR (0.88)** NB-L (0.12) NB-TR (0.66) SB-L (0.78) SB-TR (0.39)	E (66)	EB-L (0.78) **EB-TR (1.06)** WB-L (0.55) **WB-TR (1.00)** NB-L (0.34) **NB-TR (0.85)** SB-L (0.77) SB-TR (0.32)

Intersections with County Road 22	Control Type	Horizons	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour		Friday P.M. Peak Hour	
			LOS (Delay) in Seconds	Critical Movements In Bold (v/c)	LOS (Delay) in Seconds	Critical Movements In Bold (v/c)	LOS (Delay) in Seconds	Critical Movements In Bold (v/c)
Gill Road	Unsignalized	2021	C (20)	EB-LTR (0.01) WB-LTR (0.01) NB-LTR (0.07) SB-LTR (0.10)	D (27)	EB-LTR (0.01) WB-LTR (0.02) NB-LTR (0.13) SB-LTR (0.15)	E (36)	EB-LTR (0.02) WB-LTR (0.02) NB-LTR (0.06) **SB-LTR (0.25)**
		2026	D (26)	EB-LTR (0.01) WB-LTR (0.01) NB-LTR (0.06) SB-LTR (0.10)	E (36)	EB-LTR (0.01) WB-LTR (0.02) NB-LTR (0.17) **SB-LTR (0.20)**	F (53)	EB-LTR (0.02) WB-LTR (0.02) NB-LTR (0.08) **SB-LTR (0.35)**
		2031	E (36)	EB-LTR (0.01) WB-LTR (0.01) NB-LTR (0.09) **SB-LTR (0.15)**	F (69)	EB-LTR (0.02) WB-LTR (0.03) NB-LTR (0.29) **SB-LTR (0.34)**	F (104)	EB-LTR (0.03) WB-LTR (0.02) NB-LTR (0.14) **SB-LTR (0.61)**
Fox Farm Road	Unsignalized	2021	B (14)	EB-TR (0.23) WB-TL (0.01) NB-LR (0.04)	C (18)	EB-TR (0.42) WB-TL (0.02) NB-LR (0.03)	C (22)	EB-TR (0.53) WB-TL (0.02) NB-LR (0.07)
		2026	C (16)	EB-TR (0.26) WB-TL (0.01) NB-LR (0.04)	C (21)	EB-TR (0.5) WB-TL (0.02) NB-LR (0.04)	D (28)	EB-TR (0.62) WB-TL (0.02) NB-LR (0.09)
		2031	D (33)	EB-TR (0.31) WB-TL (0.04) NB-LR (0.58)	F (144)	EB-TR (0.63) WB-TL (0.20) **NB-LR (0.94)**	F (375)	EB-TR (0.76) WB-TL (0.24) **NB-LR (1.49)**
Old Second South	Unsignalized	2021	C (19)	EB-LTR (0.00) WB-LTR (0.00) NB-LTR (0.07) SB-LTR (0.06)	E (35)	EB-LTR (0.01) WB-LTR (0.01) NB-LTR (0.31) **SB-LTR (0.17)**	F (55)	EB-LTR (0.00) WB-LTR (0.01) NB-LTR (0.23) **SB-LTR (0.26)**
		2026	C (24)	EB-LTR (0) WB-LTR (0) NB-LTR (0.09) SB-LTR (0.07))	F (54)	EB-LTR (0.02) WB-LTR (0.01) **NB-LTR (0.42)** SB-LTR (0.24)	F (90)	EB-LTR (0.00) WB-LTR (0.01) NB-LTR (0.32) **SB-LTR (0.39)**
		2031	E (37)	EB-LTR (0.00) WB-LTR (0.01) NB-LTR (0.14) **SB-LTR (0.12)**	F (169)	EB-LTR (0.02) WB-LTR (0.01) **NB-LTR (0.81)** SB-LTR (0.56)	F (370)	EB-LTR (0.01) WB-LTR (0.01) NB-LTR (0.62) **SB-LTR (0.96)**
Hwy 400 South Ramp	Unsignalized	2021	B (12)	EB-TL (0.09) WB-T (0.25) WB-R (0.12) SB-LR (0.19)	C (15)	EB-TL (0.16) WB-T (0.29) WB-R (0.10) SB-LR (0.24)	C (19)	EB-TL (0.14) WB-T (0.30) WB-R (0.08) SB-LR (0.31)
		2026	B (15)	EB-TL (0.12) WB-T (0.33) WB-R (0.15) SB-LR (0.23)	C (19)	EB-TL (0.20) WB-T (0.34) WB-R (0.11) SB-LR (0.31)	D (28)	EB-TL (0.18) WB-T (0.35) WB-R (0.09) SB-LR (0.43)
		2031	C (20)	EB-TL (0.14) WB-T (0.42) WB-R (0.19) SB-LR (0.33)	E (42)	B-TL (0.23) WB-T (0.44) WB-R (0.14) **SB-LR (0.59)**	F (88)	EB-TL (0.21) WB-T (0.45) WB-R (0.11) **SB-LR (0.84)**

Intersections with County Road 22	Control Type	Horizons	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour		Friday P.M. Peak Hour	
			LOS (Delay) in Seconds	Critical Movements In Bold (v/c)	LOS (Delay) in Seconds	Critical Movements In Bold (v/c)	LOS (Delay) in Seconds	Critical Movements In Bold (v/c)
Hwy 400 North Ramp	Unsignalized	2021	C (18)	EB-T (0.15) EB-R (0.04) WB-TL (0.01) NB-L (0.17) NB-R (0.18)	D (32)	EB-T (0.26) EB-R (0.06) WB-TL (0.03) NB-L (0.47) NB-R (0.50)	D (32)	EB-T (0.30) EB-R (0.15) WB-TL (0.03) NB-L (0.42) NB-R (0.50)
		2026	D (25)	EB-T (0.17) EB-R (0.04) WB-TL (0.02) NB-L (0.24) NB-R (0.2)	F (53)	EB-T (0.32) EB-R (0.06) WB-TL (0.03) **NB-L (0.64)** NB-R (0.69)	F (52)	EB-T (0.37) EB-R (0.15) WB-TL (0.04) **NB-L (0.57)** NB-R (0.71)
		2031	F (51)	EB-T (0.24) EB-R (0.05) WB-TL (0.03) **NB-L (0.42)** NB-R (0.28)	F (110)	EB-T (0.44) EB-R (0.07) WB-TL (0.05) **NB-L (1.38)** **NB-R (1.03)**	F (276)	EB-T (0.49) EB-R (0.16) WB-TL (0.05) **NB-L (1.30)** **NB-R (1.08)**

Notes: 1. The LOS at an unsignalized intersection is defined by the movement with the highest delay under HCM 2000.
2. Critical movements are those with a volume-to-capacity ratio exceeding 0.85 for a signalized intersection or with a LOS of 'E' or 'F' for an unsignalized intersection.

The total future conditions are similar to the future background conditions. For the 2021 and 2026 horizons which represent the commissioning of OPF/MMF and five years beyond, respectively, the majority of the study intersections will operate with LOS 'E' or better. The increase in the average delays at the study area intersections are in a range from 0 to 18 seconds in comparison to the background conditions. There are a few movements at the unsignalized intersections which have a LOS 'F', but these movements are already at LOS 'F', or 'E' but approaching 'F', under the future background conditions. This indicates that the background traffic is the dominant contributor to these traffic conditions. It also should be noted that the v/c ratios of all the movements for these two horizons are still below 1.0 indicating that there is reserve capacity available.

For the 2031 horizon, the NB-L movement at the Hwy 400 North Ramp intersection deteriorates from 'E' to 'F' during the weekday a.m. peak hour, but with a low v/c ratio. In addition, the increase in the delay for this movement is only 2 seconds. Except for this movement, similar to the 2021 and 2026 horizons, the other movements with LOS 'F' or a v/c ratio greater than 1.0 were already identified under background conditions indicating that the background traffic primarily contributes to operating conditions. This is expected since the site traffic only contributes a very small portion (approximately 0 to 6%) to the total traffic on County Road 22.

Based on the above, it can be concluded that the site traffic will have a minimal impact on the boundary road network for the total future study horizons. Accordingly, no roadway improvements at the boundary intersections are required as a result of the subject site. The

assumed future road network will become very busy beyond the 2026 horizon as a result of the significant increase in background traffic growth in the vicinity of the ERRC. Therefore, it is our recommendation that the County monitor the traffic conditions within this study area and specify the necessary road improvements that are triggered by and will be the responsibility of future developments in this area.

5.0 SITE ACCESS

This section of our assessment describes the method of assessing sightline, control type plus lane configuration requirements at the site access.

5.1 Sightline Assessment

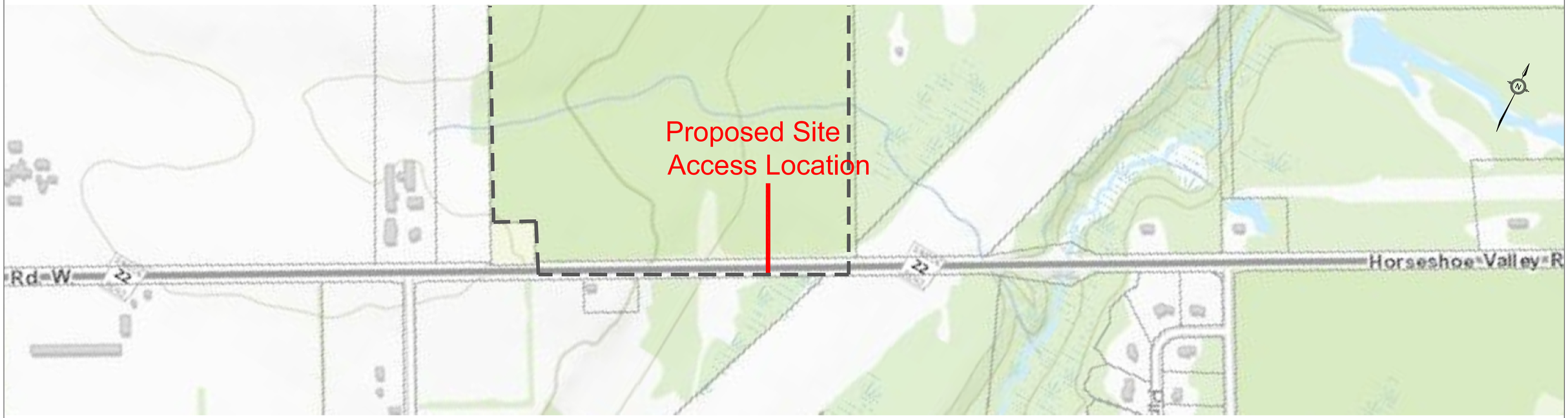
Given the fact that the horizontal alignment of County Road 22 is relatively straight, no horizontal sightline issues are anticipated.

Given the topography in this area, a vertical sightline assessment has been completed. A stopping sight distance of 230 m with adjustments for the grades on Horseshoe Valley Road was adopted based on the County's Entrance By-law No. 5544. Accordingly, it was found that the proposed access location complies with the County's sight distance requirements. Our detailed assessment is shown on **Drawing SA.**

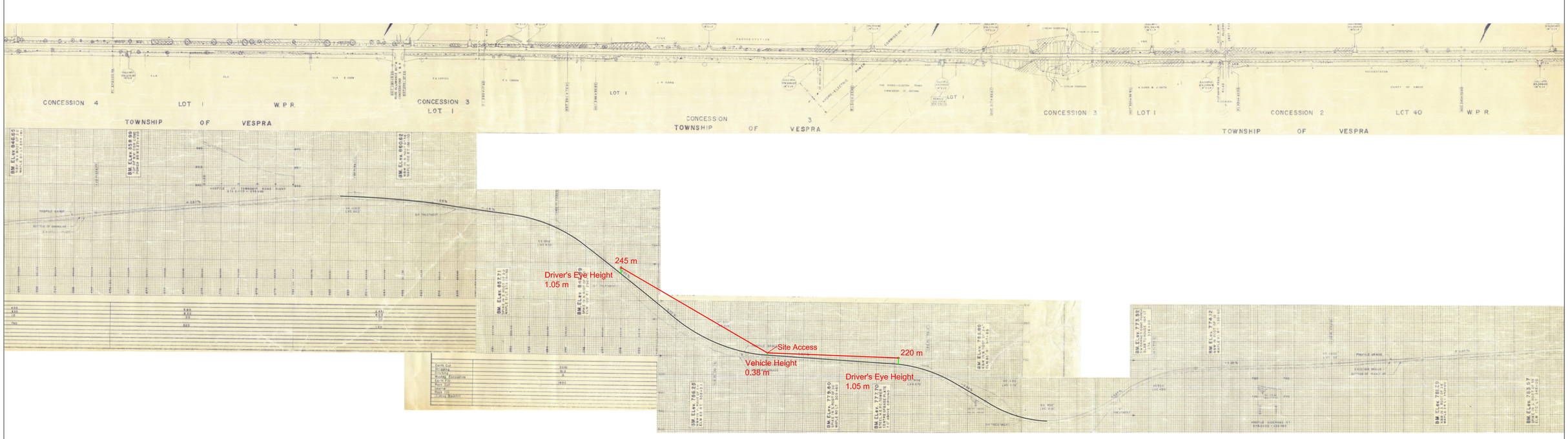
5.2 Lane configurations

Eastbound Left Turn Lane Warrant

According to the Ministry of Transportation Ontario's Geometric Design Standards for Ontario Highways (GDSOH), the requirement for a left turn lane is determined based on Volume and Collision Warrants. For future traffic conditions, only the Volume Warrants were utilized. For a roadway with a two-lane cross-section such as County Road 22, the warrant for a left turn lane is determined based on the design speed, turning, advancing and opposing design hourly volumes at the subject intersection. Accordingly, it was identified that a left turn lane is warranted at this location. The details of this warrant are summarized in **Table 5.1**. The relevant figures are included in **Appendix H**. A design speed of 100 km/h was used for County Road 22 based on its posted speed limit of 80 km/h.



COUNTY MAP



PROFILE (STOPPING SIGHT DISTANCE)

NOTE:

1. DESIGN SPEED FOR HORSESHOE VALLEY ROAD WEST - 100 km/h.

2. OBJECT HEIGHT OF 0.38m IS ASSUMED TO REPRESENT FOR A VEHICLE'S HEAD / TAIL LIGHT FOR NIGHT TIME APPLICATION.

3. STOPING SIGHT DISTANCES ARE 245m AND 220m FOR THE WESTERLY AND EASTERLY SIGHTLINES, RESPECTIVELEY, BASED ON THE COUNTY OF SIMCOE'S ENTRANCE BY-LAW NO. 5544.

LEGEND:

PROFILE GRADE

STOPPING SIGHT DISTANCE

C:\Users\ChouM\Pictures\CoLogo_WSP-MMM_Colour_H_RGB.jpg

SCALE: 25 0 50 HORIZONTAL; 2.5 0 5 VERTICAL

DATE: 11.02.2016

PREPARED BY: MC

CHECKED BY: FY

SIGHT LINE ANALYSIS

2976 Horseshoe Valley Road West, County of Simcoe, Ontario

SHEET NO: **SA**

TABLE 5.1
EASTBOUND LEFT TURN LANE WARRANT ANALYSIS AT SITE ACCESS

Horizons	Peak Periods	Left Turn Percentage	Advancing Volumes	Opposing Volumes	Figure No.	Warranted?	Required Storage Length (m)
2021	Weekday A.M.	5.4%	373	482	Figure H-1	YES	25
	Weekday P.M.	6.6%	656	528	Figure H-1	YES	40
	Friday P.M.	5.2%	826	572	Figure H-1	YES	40
2026	Weekday A.M.	10.8%	437	611	Figure H-2	YES	30
	Weekday P.M.	7.5%	777	600	Figure H-2	YES	40
	Friday P.M.	6.1%	955	646	Figure H-2	YES	40
2031	Weekday A.M.	9.3%	506	785	Figure H-3	YES	40
	Weekday P.M.	5.8%	992	725	Figure H-3	YES	40
	Friday P.M.	4.9%	1178	773	Figure H-3	YES	40

As noted previously, the assumptions related to background developments in this study were very conservative. Therefore, the background traffic projections may be overly optimistic. Nevertheless, since the implementation of this lane will be beneficial for both through and ERRC left-turning traffic, we recommend that an eastbound left turn lane be implemented prior to the opening of the ERRC.

Westbound Right Turn Lane Warrant

Based on our literature search and review, limited guidelines or policies exist with respect to right turn lane warrants. However, the "Right Turn Lane Policy and Design Guideline for Durham Region" was consulted in this study since it is a very comprehensive, "local" reference. Similar to the Left Turn Lane Warrant in the MTO's GDSOH, for a roadway with a two-lane cross-section, the warrant for a right turn lane is determined based on the design speed, approaching and right turning volumes. Our analysis confirmed that a right turn lane is not warranted. Referenced excerpts are included in **Appendix I.**

Truck Climbing Lane Warrant

The MTO's GDSOH was consulted to examine if a truck climbing lane (TCL) is warranted for the westbound movement on County Road 22. The segment in question extends from a point located approximately 420 m to the east of the easterly site limit where a noticeable grade begins in the vicinity of the proposed site access.

According to the document, a TCL is warranted if each of the following criteria is satisfied:

1. One of the following conditions exists:
   - Level of Service 'E' or 'F' exists on the grade;
   - A reduction of two or more levels of service is experienced when moving from the approach segment to the grade; or
   - A 15 km/h or greater speed reduction is expected for a typical heavy truck; and
2. Upgrade traffic flow exceeds 200 vehicles per hour; and
3. Upgrade truck flow exceeds 20 vehicles per hour.

The findings of the TCL warrant are summarized in **Table 5.2**. Detailed warrant calculations and the location of the road segment that was examined are included in **Appendix J**.

TABLE 5.2
WESTBOUND CLIMBING LANE WARRANT

Horizons	Warranted?	Satisfied Criterion
Existing	NO	Criteria 1 and 2
Future Background 2021,2026 and 2031 Horizons	YES	All Criteria
Total Future 2021,2026 and 2031Horizons	YES	All Criteria

A TCL is warranted under the future background 2021 condition and, accordingly, all horizons beyond it. This indicates that the background traffic primarily contributes to this warrant rather than site-generated traffic. Since this TCL can be beneficial for both existing and future traffic conditions in this area, we recommend that it be implemented. Given the characteristics of a TCL, the property requirements (if any) and the local context in this area, a separate detailed study including a functional design at the site access should be undertaken prior to implementation.

Summary

Based on the above analysis, our recommendations with respect to the lane configurations at the site access are summarized below:

- An eastbound left turn lane is required;
- An westbound right turn lane is not required; and
- A TCL is required.

In addition, southbound left and right turn lanes are recommended to facilitate traffic movements as they exit from the ERRC. A functional design of the site access will be further developed in a separate study.

5.3 Traffic Conditions and Signal Warrant

Based on the traffic volumes and the above recommended lane configurations, the total future traffic conditions were assessed at the site driveway intersection for two control types.

- **Stop Controlled**

For the unsignalized intersection scenario, the traffic operational results are outlined in **Table 5.3**. Detailed intersection capacity analysis sheets are included in **Appendix K**.

TABLE 5.3
INTERSECTION CAPACITY ANALYSIS - UNSIGNALIZED SITE ACCESS
TOTAL FUTURE TRAFFIC CONDITIONS

Intersections with County Road 22	Horizons	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour		Friday P.M. Peak Hour	
		LOS (Delay) in Seconds	Critical Movements in Bold (v/c)	LOS (Delay) in Seconds	Critical Movements in Bold (v/c)	LOS (Delay) in Seconds	Critical Movements in Bold (v/c)
Site Access	2021	C (23)	EB-L (0.03) EB-T (0.22) WB-TR (0.3) SB-L (0.12) SB-R (0.00)	F (61)	EB-L (0.07) EB-T (0.38) WB-TR (0.33) **SB-L (0.50)** SB-R (0.01)	F (115)	EB-L (0.07) EB-T (0.48) WB-TR (0.35) **SB-L (0.72)** SB-R (0.02)
	2026	E (39)	EB-L (0.08) EB-T (0.24) WB-TR (0.38) SB-L (0.29) SB-R (0.00)	F (205)	EB-L (0.1) EB-T (0.45) WB-TR (0.37) **SB-L (1.06)** SB-R (0.02)	F (432)	EB-L (0.1) EB-T (0.56) WB-TR (0.4) **SB-L (1.54)** SB-R (0.02)
	2031	F (67)	EB-L (0.10) EB-T (0.28) WB-TR (0.49) **SB-L (0.44)** SB-R (0.00)	F (608)	EB-L (0.11) EB-T (0.58) WB-TR (0.45) **SB-L (1.89)** SB-R (0.03)	F (1091)	EB-L (0.12) EB-T (0.69) WB-TR (0.48) **SB-L (2.83)** SB-R (0.03)

Notes: 1. The LOS at an unsignalized intersection is defined by the movement with the highest delay under HCM 2000.
2. Critical movements are those with a volume-to-capacity ratio exceeding 0.85 for a signalized intersection or with a LOS of 'E' or 'F' for an unsignalized intersection.

Under total future conditions for the 2021 horizon, all movements are expected to operate well under capacity, except for the SBL movement exiting the site which will experience a LOS of 'F' during the p.m. peak hours. As for the 2026 and 2031 horizons, traffic conditions for this movement deteriorate further, and is expected that this movement will operate over capacity during the p.m. peak hours. The southbound left turn will also experience significant delays ranging from two to more than 18 minutes. These delays and the resulting queues would be contained on site, however, so will not affect traffic operations on County Road 22.

To improve future traffic conditions at this location, the feasibility of signalized control was investigated, and our findings are outlined in the following section.

- **Signalized Intersection**

Signal Warrant

To confirm if traffic control signals are required at this intersection, a signal warrant analysis was conducted based on the Ontario Traffic Manual Book 12 (OTM 12). It was found that signals are not warranted at this location for the 2031 horizon. The detailed calculation sheets are included in **Appendix L.** However, the signal warrant relies on the sheer number

of existing or projected vehicle volumes without distinguishing among different types of vehicles. For example, fully-loaded trucks leaving the ERRC require longer gap times in comparison to passenger vehicles, especially if they are making left turns. Furthermore, another warrant criterion is the number of collisions that could be prevented by the installation of signals. This is a statistic that is not available for the future condition. Finally, there is a recreational trail that crosses Horseshoe Valley Road in the vicinity of the ERRC site. If this crossing were to be located adjacent to the site access, then the off-road vehicles, pedestrians and cyclists would augment the crossing volumes at this location.

Given these circumstances, together with the hilly topography of Horseshoe Valley Road in the vicinity of the ERRC access, we recommend that provisions be made to signalize this intersection. This would include the installation of the necessary underground ducts and handwells to enable signals to be installed in the future. Accordingly, this intersection can be monitored periodically to confirm if the warrants are satisfied. If signals are ultimately installed, we recommend that they operate in a “semi-actuated” mode. This style of operation requires the signals to “rest” in green for Horseshoe Valley Road until a call is received from vehicles exiting the ERRC facility, or from pedestrians, cyclists or off-road vehicles who intend to cross Horseshoe Valley Road at this access. This would provide the most efficient style of operation which would minimize delays to traffic on Horseshoe Valley Road, while ensuring a more convenient means of egress for heavy trucks and other vehicles leaving the ERRC facility, as well as providing a better crossing environment for all users of the recreational trail.

For the scenario with a signalized intersection, the traffic operational results are outlined in **Table 5.4**. Detailed intersection capacity analysis sheets are included in **Appendix M**.

TABLE 5.4
INTERSECTION CAPACITY ANALYSIS-SIGNALIZED SITE ACCESS
TOTAL FUTURE TRAFFIC CONDITIONS

Intersections with County Road 22	Horizons	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour		Friday P.M. Peak Hour	
		LOS (Delay) in Seconds	Critical Movements (v/c)	LOS (Delay) in Seconds	Critical Movements (v/c)	LOS (Delay) in Seconds	Critical Movements (v/c)
Site Access	2021	A (3)	EB-L (0.05) EB-T (0.22) WB-TR (0.31) SB-L (0.16) SB-R (0.00)	A (8)	EB-L (0.14) EB-T (0.46) WB-TR (0.40) SB-L (0.38) SB-R (0.04)	A (9)	EB-L (0.15) EB-T (0.58) WB-TR (0.43) SB-L (0.38) SB-R (0.04)
	2026	A (4)	EB-L (0.14) EB-T (0.25) WB-TR (0.39) SB-L (0.24) SB-R (0.00)	B (10)	EB-L (0.23) EB-T (0.55) WB-TR (0.47) SB-L (0.48) SB-R (0.05)	B (13)	EB-L (0.27) EB-T (0.73) WB-TR (0.53) SB-L (0.52) SB-R (0.05)
	2031	A (6)	EB-L (0.19) EB-T (0.32) WB-TR (0.51) SB-L (0.24)	B (14)	EB-L (0.31) EB-T (0.76) WB-TR (0.60) SB-L (0.52)	B (16)	EB-L (0.29) EB-T (0.83) WB-TR (0.58) SB-L (0.61)

Intersections with County Road 22	Horizons	Weekday A.M. Peak Hour		Weekday P.M. Peak Hour		Friday P.M. Peak Hour	
		LOS (Delay) in Seconds	Critical Movements (v/c)	LOS (Delay) in Seconds	Critical Movements (v/c)	LOS (Delay) in Seconds	Critical Movements (v/c)
			SB-R (0.00)		SB-R (0.05)		SB-R (0.06)

Notes: 1. The LOS at an unsignalized intersection is defined by the movement with the highest delay under HCM 2000.
2. Critical movements are those with a volume-to-capacity ratio exceeding 0.85 for a signalized intersection or with a LOS of 'E' or 'F' for an unsignalized intersection.

Should traffic signals be implemented at this intersection, all movements are expected to operate at a very good LOS ('B' or better) during all study peak hours for future conditions. No critical movements were identified.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the analyses, the following conclusions can be drawn:

- Under existing conditions, all of the study area intersections are operating at a good overall LOS 'C' or better during the weekday a.m. and p.m. plus Friday p.m. peak hours, with no critical or over-capacity movements identified;
- The site is expected to generate between 89 and 148 trips during the studied peak hours for the design capacity of this facility which will occur at the 30-year horizon (2049);
- A 1% annual growth rate was applied to the arterial through movements within the study area based on our review of the background development traffic studies and historical ADT counts;
- Background development information was provided by the County, development stakeholders through the Township of Oro-Medonte for the Horseshoe Craighurst Secondary Areas (HCSA), the Master Servicing Plan process, the Midhurst Secondary Areas (MSA) plus other proposed and potential developments in the vicinity of the study area;
- Under the 2021 and 2026 future background conditions, the majority of the study intersections are expected to operate at a reasonable overall LOS 'E' or better, with only one critical movement. However, this critical movement is within the available roadway capacity;
- For the 2031 future background conditions, all of the study area intersections are expected to continue operating at an acceptable LOS 'E' or better during the a.m. peak hour. For the weekday and Friday p.m. peak hours, a few critical movements have a LOS of 'F' and will operate "over" capacity. However, the future background conditions are solely the result of the background traffic growth. Accordingly, it is our recommendation that traffic conditions within this study area, particularly the County Road 27/22 intersection, be monitored through the future traffic studies completed for the Site Plan Applications for these background developments, or through studies initiated by the County. The need for any road improvements should be examined in greater detail as part of these studies;
- For the 2021 and 2026 total future horizons, which represent the commissioning of OPF/MMF and five years beyond, the majority of the study intersections will operate at a LOS 'E' or better. The v/c ratios for all the movements examined within these two horizons are below 1.0 indicating that there is still reserve capacity available;
- For the 2031 total future conditions, similar to the 2021 and 2026 horizons, the other movements with a LOS 'F' or a v/c ratio greater than 1.0 were already identified under background conditions indicating that the background traffic primarily contributes to these problematic intersections or movements. This is expected since the site traffic contributes a very small portion (approximately 0 to 5%) to the total traffic on County Road 22;

- In conclusion, the site traffic will have a minimal impact on the boundary road network for the total future study horizon. Accordingly, no roadway improvements are required at any of the boundary intersections analyzed as a result of the subject site. The future road network will become very busy beyond the 2026 horizon as a result of the significant increase in background traffic growth in the vicinity of the ERRC;
- The vertical sightline assessment results indicate that there is adequate stopping sight distance available for the proposed access location;
- The recommended lane configurations and control types at the Site Access are as follows:
  - An eastbound left turn lane is warranted based on MTO's Geometric Design Standards for Ontario Highways;
  - A westbound right turn lane is not warranted based on our literature reviews; and
  - A truck climbing lane (TCL) is warranted under the future background 2021 condition and beyond. This indicates that the background traffic primarily contributes to this warrant rather than site traffic. Since this TCL will enhance the traffic operations in this area, we recommend that it be constructed at the same time as the site access and eastbound left turn lane. Given the characteristics of a TCL, the property requirements and the local context in this area, a separate detailed study including the preparation of a comprehensive functional design at the site access should be undertaken;
- A signal is not warranted based on OTM Book 12. However, the site driveway is expected to operate over capacity and experience significant delays for the 2026 and 2031 horizons. Therefore, to ensure a more convenient means of egress for heavy trucks and other vehicles leaving the ERRC facility, as well as providing a better crossing environment for all users of the adjacent recreational trail, we recommend that provisions be made to signalize this intersection. This would include the installation of the necessary underground ducts and handwells to enable signals to be installed in the future. Accordingly, this intersection can be monitored periodically to confirm if the warrants are satisfied.

APPENDIX A

Turning Movement Counts and Signal Timing Plans

MMM Group Limited
MMM Group Limited
Thornhill ONTARIO, CANADA, L3T 0A1

Turning Movement Count (7 . COUNTY ROAD 22 & COUNTY ROAD 93 (PENETANGUISHENE RD))

Start Time	N Approach COUNTY ROAD 93 (PENETANGUISHENE RD)						E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						S Approach COUNTY ROAD 93 (PENETANGUISHENE RD)						W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	U-Turn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	U-Turn W:W	Peds W:	Approach Total		
07:00:00	3	9	4	0	0	16	6	31	1	0	0	38	4	12	6	0	0	22	7	21	1	0	0	29	105	
07:15:00	2	17	8	0	0	27	5	42	3	0	0	50	3	11	3	0	0	17	7	39	0	0	0	46	140	
07:30:00	6	23	9	0	0	38	6	42	8	0	0	56	4	10	8	0	0	22	10	38	0	0	0	48	164	
07:45:00	4	16	13	0	0	33	4	59	14	0	0	77	8	9	13	0	0	30	13	45	7	0	0	65	205	614
08:00:00	2	21	14	0	0	37	4	42	3	0	0	49	4	12	6	0	0	22	10	47	1	0	0	58	166	675
08:15:00	3	17	13	0	0	33	3	51	6	0	0	60	2	7	6	0	0	15	15	54	4	0	0	73	181	716
08:30:00	1	19	4	0	0	24	4	49	3	0	0	56	5	14	10	0	0	29	13	43	2	0	0	58	167	719
08:45:00	3	14	12	0	0	29	10	34	4	0	1	48	12	11	7	0	0	30	8	44	3	0	0	55	162	676
09:00:00	3	22	10	0	0	35	2	57	5	0	0	64	7	15	4	0	0	26	7	56	1	0	0	64	189	699
09:15:00	1	11	4	0	0	16	0	45	6	0	0	51	6	8	12	0	0	26	15	48	2	0	0	65	158	676
09:30:00	7	16	7	0	0	30	3	58	4	0	0	65	4	19	4	0	0	27	10	44	1	0	0	55	177	686
09:45:00	5	11	10	0	0	26	2	51	3	0	0	56	6	17	14	0	0	37	7	42	2	0	0	51	170	694
10:00:00	7	9	2	0	0	18	7	51	2	0	1	60	5	8	8	0	0	21	14	57	6	0	0	77	176	681
10:15:00	6	18	6	0	0	30	4	45	5	0	0	54	3	17	15	0	0	35	11	43	4	0	0	58	177	700
10:30:00	7	17	3	0	0	27	8	58	4	0	0	70	1	15	10	0	0	26	13	41	10	0	0	64	187	710
10:45:00	6	11	6	0	0	23	4	74	8	0	0	86	6	15	9	0	0	30	8	60	5	0	0	73	212	752
11:00:00	8	15	6	0	0	29	10	66	4	0	0	80	1	16	17	0	0	34	19	50	8	0	0	77	220	796
11:15:00	5	6	9	0	0	20	4	53	6	0	0	63	5	16	22	0	0	43	8	50	8	0	0	66	192	811
11:30:00	3	11	8	0	0	22	11	45	2	0	0	58	7	15	22	0	0	44	9	48	6	0	0	63	187	811
11:45:00	5	11	4	0	0	20	6	48	6	0	0	60	10	15	10	0	0	35	7	49	12	0	0	68	183	782
BREAK																										
16:00:00	6	18	7	0	0	31	6	67	4	0	0	77	1	13	14	0	0	28	16	55	18	0	0	89	225	
16:15:00	5	9	9	0	0	23	9	64	2	0	0	75	3	19	16	0	0	38	23	73	17	0	0	113	249	
16:30:00	10	17	6	0	0	33	12	56	4	0	0	72	9	32	16	0	0	57	12	66	10	0	0	88	250	
16:45:00	8	20	6	0	0	34	18	66	8	0	0	92	7	23	17	0	0	47	14	87	23	0	0	124	297	1021
17:00:00	14	16	9	0	0	39	16	69	11	0	0	96	12	26	23	0	0	61	15	80	13	0	0	108	304	1100
17:15:00	7	22	8	0	0	37	11	52	3	0	0	66	7	17	19	0	1	43	22	73	16	0	0	111	257	1108
17:30:00	11	12	11	0	0	34	9	62	4	0	0	75	3	28	16	0	1	47	18	74	12	0	0	104	260	1118
17:45:00	2	15	5	0	0	22	4	32	3	0	0	39	6	17	13	0	0	36	24	75	12	0	0	111	208	1029
18:00:00	6	15	6	0	0	27	9	42	6	0	0	57	3	17	18	0	0	38	7	58	16	0	0	81	203	928
18:15:00	11	13	8	0	0	32	3	30	1	0	0	34	1	16	10	0	0	27	19	48	7	0	0	74	167	838

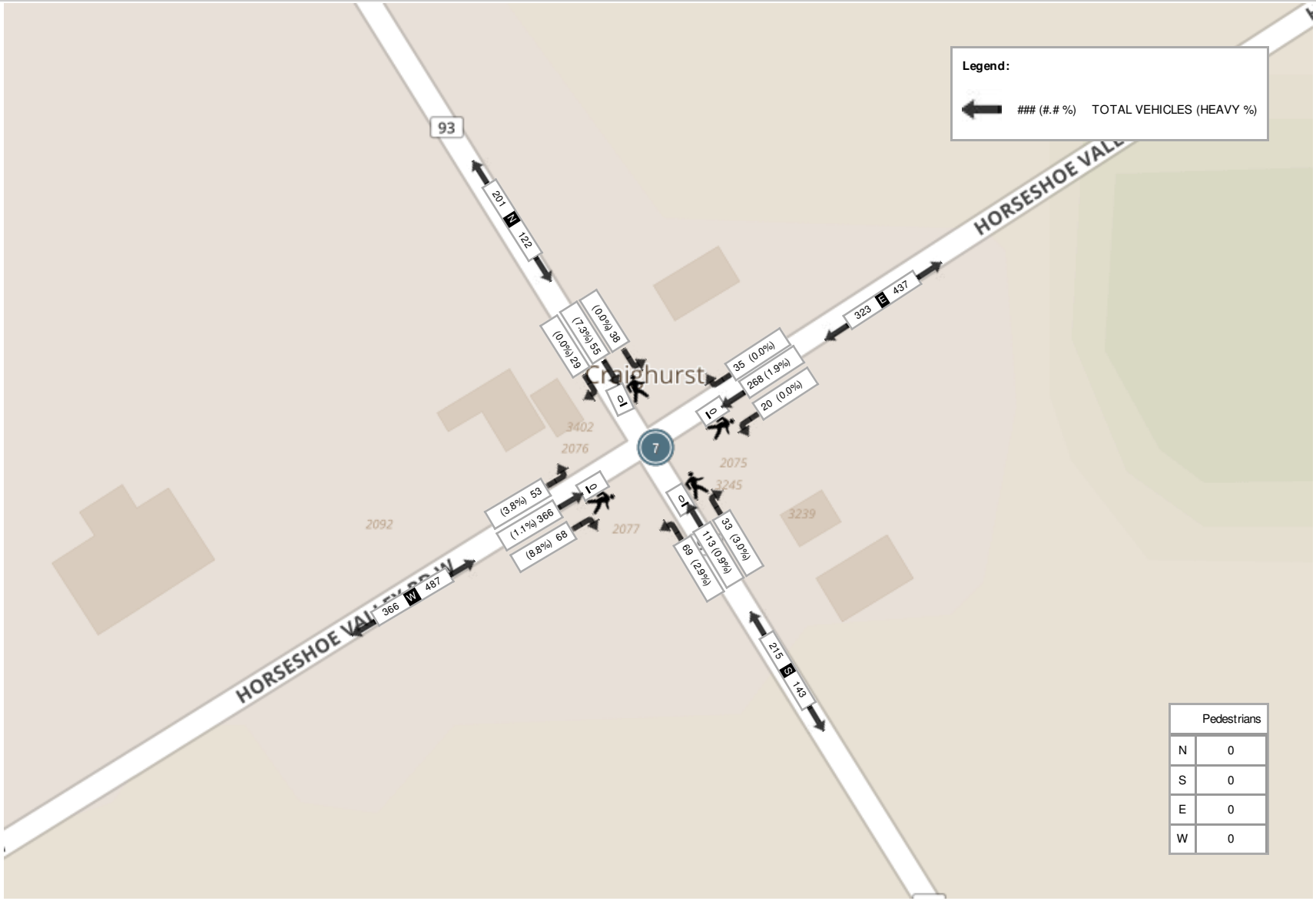
Turning Movement Count (7 . COUNTY ROAD 22 & COUNTY ROAD 93 (PENETANGUISHENE RD))

Start Time	N Approach COUNTY ROAD 93 (PENETANGUISHENE RD)						E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						S Approach COUNTY ROAD 93 (PENETANGUISHENE RD)						W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	U-Turn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	U-Turn W:W	Peds W:	Approach Total		
16:00:00	6	14	5	0	0	25	10	60	3	0	0	73	3	32	28	0	0	63	6	93	14	0	0	113	274	
16:15:00	7	14	6	0	0	27	6	54	1	0	0	61	11	24	21	0	0	56	18	81	15	0	0	114	258	
16:30:00	6	23	4	0	0	33	11	77	5	0	0	93	8	27	16	0	0	51	12	101	12	0	0	125	302	
16:45:00	5	8	7	0	0	20	13	62	4	0	0	79	10	31	18	0	0	59	16	84	12	0	0	112	270	1104
17:00:00	7	10	17	0	0	34	8	57	4	0	0	69	3	29	16	0	0	48	21	93	15	0	0	129	280	1110
17:15:00	11	14	10	0	0	35	3	72	7	0	0	82	12	26	19	0	0	57	19	88	14	0	0	121	295	1147
17:30:00	9	8	5	0	0	22	7	48	2	0	0	57	12	21	11	0	0	44	17	78	11	0	0	106	229	1074
17:45:00	10	10	9	0	0	29	7	36	3	0	0	46	7	17	18	0	0	42	17	67	18	1	0	103	220	1024
18:00:00	7	9	8	0	0	24	9	51	3	0	0	63	2	13	17	0	0	32	7	68	11	0	0	86	205	949
18:15:00	8	9	5	0	0	22	4	43	2	0	0	49	2	23	10	0	0	35	12	68	10	0	0	90	196	850
18:30:00	1	11	4	0	0	16	3	40	2	0	2	45	3	15	10	0	0	28	8	61	8	0	0	77	166	787
18:45:00	9	7	4	0	0	20	10	55	8	0	0	73	4	14	9	0	0	27	7	74	8	0	0	89	209	776
Grand Total	86	137	84	0	0	307	91	655	44	0	2	790	77	272	193	0	0	542	160	956	148	1	0	1265	**2904**	-
Approach%	28%	44.6%	27.4%	0%		-	11.5%	82.9%	5.6%	0%		-	14.2%	50.2%	35.6%	0%		-	12.6%	75.6%	11.7%	0.1%		-	**-**	-
Totals %	3%	4.7%	2.9%	0%		10.6%	3.1%	22.6%	1.5%	0%		27.2%	2.7%	9.4%	6.6%	0%		18.7%	5.5%	32.9%	5.1%	0%		43.6%	**-**	-
Heavy	0	6	0	0		-	1	11	1	0		-	1	5	6	0		-	9	25	2	0		-	**-**	-
Heavy %	0%	4.4%	0%	0%		-	1.1%	1.7%	2.3%	0%		-	1.3%	1.8%	3.1%	0%		-	5.6%	2.6%	1.4%	0%		-	**-**	-
Bicycles	0	0	0	0		-	0	0	0	0		-	0	0	1	0		-	2	0	0	0		-	**-**	-
Bicycle %	0%	0%	0%	0%		-	0%	0%	0%	0%		-	0%	0%	0.5%	0%		-	1.3%	0%	0%	0%		-	**-**	-

Peak Hour: 04:30 PM - 05:30 PM Weather:

Start Time	N Approach COUNTY ROAD 93 (PENETANGUISHENE RD)						E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						S Approach COUNTY ROAD 93 (PENETANGUISHENE RD)						W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
16:30:00	6	23	4	0	0	33	11	77	5	0	0	93	8	27	16	0	0	51	12	101	12	0	0	125	302
16:45:00	5	8	7	0	0	20	13	62	4	0	0	79	10	31	18	0	0	59	16	84	12	0	0	112	270
17:00:00	7	10	17	0	0	34	8	57	4	0	0	69	3	29	16	0	0	48	21	93	15	0	0	129	280
17:15:00	11	14	10	0	0	35	3	72	7	0	0	82	12	26	19	0	0	57	19	88	14	0	0	121	295
Grand Total	29	55	38	0	0	122	35	268	20	0	0	323	33	113	69	0	0	215	68	366	53	0	0	487	**1147**
Approach%	23.8%	45.1%	31.1%	0%		-	10.8%	83%	6.2%	0%		-	15.3%	52.6%	32.1%	0%		-	14%	75.2%	10.9%	0%		-	**-**
Totals %	2.5%	4.8%	3.3%	0%		10.6%	3.1%	23.4%	1.7%	0%		28.2%	2.9%	9.9%	6%	0%		18.7%	5.9%	31.9%	4.6%	0%		42.5%	**-**
PHF	0.66	0.6	0.56	0		0.87	0.67	0.87	0.71	0		0.87	0.69	0.91	0.91	0		0.91	0.81	0.91	0.88	0		0.94	**-**
Heavy	0	4	0	0		4	0	5	0	0		5	1	1	2	0		4	6	4	2	0		12	**-**
Heavy %	0%	7.3%	0%	0%		3.3%	0%	1.9%	0%	0%		1.5%	3%	0.9%	2.9%	0%		1.9%	8.8%	1.1%	3.8%	0%		2.5%	**-**
Lights	29	51	38	0		118	35	263	20	0		318	32	112	67	0		211	62	362	51	0		475	**-**
Lights %	100%	92.7%	100%	0%		96.7%	100%	98.1%	100%	0%		98.5%	97%	99.1%	97.1%	0%		98.1%	91.2%	98.9%	96.2%	0%		97.5%	**-**
Single-Unit Trucks	0	3	0	0		3	0	2	0	0		2	0	1	1	0		2	5	3	1	0		9	**-**
Single-Unit Trucks %	0%	5.5%	0%	0%		2.5%	0%	0.7%	0%	0%		0.6%	0%	0.9%	1.4%	0%		0.9%	7.4%	0.8%	1.9%	0%		1.8%	**-**
Buses	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	0	0	0	0		0	**-**
Buses %	0%	0%	0%	0%		0%	0%	0.4%	0%	0%		0.3%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Articulated Trucks	0	1	0	0		1	0	2	0	0		2	1	0	1	0		2	1	1	1	0		3	**-**
Articulated Trucks %	0%	1.8%	0%	0%		0.8%	0%	0.7%	0%	0%		0.6%	3%	0%	1.4%	0%		0.9%	1.5%	0.3%	1.9%	0%		0.6%	**-**
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	1	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

Peak Hour: 04:30 PM - 05:30 PM Weather:



Turning Movement Count (5 . COUNTY ROAD 22 & HIGHWAY 400 NORTH RAMP)

Start Time	N Approach HIGHWAY 400 SOUTHBOUND ON / OFF RAMP					E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)					W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)					Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Left N:E	U-Turn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	U-Turn E:E	Peds E:	Approach Total	Thru W:E	Left W:N	U-Turn W:W	Peds W:	Approach Total		
07:00:00	10	3	0	0	13	29	24	0	0	53	19	11	0	0	30	96	
07:15:00	10	0	0	0	10	28	25	0	0	53	34	15	0	0	49	112	
07:30:00	10	0	0	0	10	34	21	0	0	55	41	20	0	0	61	126	
07:45:00	9	0	0	0	9	32	35	0	0	67	42	25	0	0	67	143	477
08:00:00	14	2	0	0	16	30	42	0	0	72	47	24	0	0	71	159	540
08:15:00	14	0	0	0	14	42	25	0	0	67	50	31	0	0	81	162	590
08:30:00	12	0	0	0	12	38	37	0	0	75	38	23	0	0	61	148	612
08:45:00	9	2	0	0	11	19	34	0	0	53	37	19	0	0	56	120	589
09:00:00	13	1	0	0	14	30	30	0	0	60	51	14	0	0	65	139	569
09:15:00	11	3	1	0	15	25	40	0	0	65	49	15	0	0	64	144	551
09:30:00	17	3	0	0	20	29	41	0	0	70	40	15	0	0	55	145	548
09:45:00	17	2	0	0	19	23	56	0	0	79	43	20	0	0	63	161	589
10:00:00	15	1	0	0	16	28	43	0	0	71	71	20	0	0	91	178	628
10:15:00	11	3	0	0	14	20	44	0	0	64	47	11	0	0	58	136	620
10:30:00	10	0	0	0	10	27	53	0	0	80	57	11	0	0	68	158	633
10:45:00	18	1	0	0	19	28	46	0	0	74	50	16	0	0	66	159	631
11:00:00	16	0	0	0	16	43	61	0	0	104	60	12	0	0	72	192	645
11:15:00	23	1	0	0	24	25	60	0	0	85	44	12	0	0	56	165	674
11:30:00	23	0	0	0	23	19	52	0	0	71	49	16	0	0	65	159	675
11:45:00	15	1	0	0	16	22	52	0	0	74	54	16	0	0	70	160	676
BREAK																	
16:00:00	23	2	1	0	26	30	71	0	0	101	75	16	0	0	91	218	
16:15:00	20	3	0	0	23	20	60	0	0	80	75	15	0	0	90	193	

16:30:00	15	2	0	0	17	22	72	0	0	94	83	14	0	0	97	208	
16:45:00	28	1	0	0	29	30	83	0	0	113	87	11	0	0	98	240	859
17:00:00	16	0	0	0	16	33	79	0	0	112	81	16	0	0	97	225	866
17:15:00	20	2	0	0	22	20	63	0	0	83	80	23	0	0	103	208	881
17:30:00	17	1	0	0	18	27	81	0	0	108	78	17	0	0	95	221	894
17:45:00	12	3	0	0	15	13	48	0	0	61	67	10	0	0	77	153	807
18:00:00	14	1	0	0	15	23	50	0	0	73	51	9	0	0	60	148	730
18:15:00	25	0	0	0	25	9	36	0	0	45	66	11	0	0	77	147	669
18:30:00	14	0	0	0	14	17	40	0	0	57	45	13	0	0	58	129	577
18:45:00	6	0	0	0	6	14	29	0	0	43	45	3	0	0	48	97	521
Grand Total	487	38	2	0	527	829	1533	0	0	2362	1756	504	0	0	2260	**5149**	-
Approach%	92.4%	7.2%	0.4%		-	35.1%	64.9%	0%		-	77.7%	22.3%	0%		-	**-**	-
Totals %	9.5%	0.7%	0%		10.2%	16.1%	29.8%	0%		45.9%	34.1%	9.8%	0%		43.9%	**-**	-
Heavy	29	2	0		-	86	86	0		-	135	44	0		-	**-**	-
Heavy %	6%	5.3%	0%		-	10.4%	5.6%	0%		-	7.7%	8.7%	0%		-	**-**	-
Bicycles	0	0	0		-	0	0	0		-	2	0	0		-	**-**	-
Bicycle %	0%	0%	0%		-	0%	0%	0%		-	0.1%	0%	0%		-	**-**	-

Peak Hour: 11:00 AM - 12:00 PM Weather:

Start Time	N Approach HIGHWAY 400 SOUTHBOUND ON / OFF RAMP					E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)					W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)					Int. Total (15 min)
	Right	Left	U-Turn	Peds	Approach Total	Right	Thru	U-Turn	Peds	Approach Total	Thru	Left	U-Turn	Peds	Approach Total	
11:00:00	16	0	0	0	16	43	61	0	0	104	60	12	0	0	72	192
11:15:00	23	1	0	0	24	25	60	0	0	85	44	12	0	0	56	165
11:30:00	23	0	0	0	23	19	52	0	0	71	49	16	0	0	65	159
11:45:00	15	1	0	0	16	22	52	0	0	74	54	16	0	0	70	160
Grand Total	77	2	0	0	79	109	225	0	0	334	207	56	0	0	263	**676**
Approach%	97.5%	2.5%	0%		-	32.6%	67.4%	0%		-	78.7%	21.3%	0%		-	-
Totals %	11.4%	0.3%	0%		11.7%	16.1%	33.3%	0%		49.4%	30.6%	8.3%	0%		38.9%	-
PHF	0.84	0.5	0		0.82	0.63	0.92	0		0.8	0.86	0.88	0		0.91	-
Heavy	5	1	0		6	20	13	0		33	21	7	0		28	-
Heavy %	6.5%	50%	0%		7.6%	18.3%	5.8%	0%		9.9%	10.1%	12.5%	0%		10.6%	-
Lights	72	1	0		73	89	212	0		301	186	49	0		235	-
Lights %	93.5%	50%	0%		92.4%	81.7%	94.2%	0%		90.1%	89.9%	87.5%	0%		89.4%	-
Single-Unit Trucks	3	1	0		4	16	7	0		23	11	3	0		14	-
Single-Unit Trucks %	3.9%	50%	0%		5.1%	14.7%	3.1%	0%		6.9%	5.3%	5.4%	0%		5.3%	-
Buses	0	0	0		0	0	1	0		1	0	0	0		0	-
Buses %	0%	0%	0%		0%	0%	0.4%	0%		0.3%	0%	0%	0%		0%	-
Articulated Trucks	2	0	0		2	4	5	0		9	10	4	0		14	-
Articulated Trucks %	2.6%	0%	0%		2.5%	3.7%	2.2%	0%		2.7%	4.8%	7.1%	0%		5.3%	-
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	-
Bicycles on Road%	-	-	-	%		-	-	-	%		-	-	-	%		-

Peak Hour: 04:45 PM - 05:45 PM Weather:

Start Time	N Approach HIGHWAY 400 SOUTHBOUND ON / OFF RAMP					E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)					W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)					Int. Total (15 min)
	Right	Left	U-Turn	Peds	Approach Total	Right	Thru	U-Turn	Peds	Approach Total	Thru	Left	U-Turn	Peds	Approach Total	
16:45:00	28	1	0	0	29	30	83	0	0	113	87	11	0	0	98	240
17:00:00	16	0	0	0	16	33	79	0	0	112	81	16	0	0	97	225
17:15:00	20	2	0	0	22	20	63	0	0	83	80	23	0	0	103	208
17:30:00	17	1	0	0	18	27	81	0	0	108	78	17	0	0	95	221
Grand Total	81	4	0	0	85	110	306	0	0	416	326	67	0	0	393	**894**
Approach%	95.3%	4.7%	0%		-	26.4%	73.6%	0%		-	83%	17%	0%		-	-
Totals %	9.1%	0.4%	0%		9.5%	12.3%	34.2%	0%		46.5%	36.5%	7.5%	0%		44%	-
PHF	0.72	0.5	0		0.73	0.83	0.92	0		0.92	0.94	0.73	0		0.95	-
Heavy	5	0	0		5	6	9	0		15	10	5	0		15	-
Heavy %	6.2%	0%	0%		5.9%	5.5%	2.9%	0%		3.6%	3.1%	7.5%	0%		3.8%	-
Lights	76	4	0		80	104	297	0		401	316	62	0		378	-
Lights %	93.8%	100%	0%		94.1%	94.5%	97.1%	0%		96.4%	96.9%	92.5%	0%		96.2%	-
Single-Unit Trucks	2	0	0		2	4	2	0		6	7	4	0		11	-
Single-Unit Trucks %	2.5%	0%	0%		2.4%	3.6%	0.7%	0%		1.4%	2.1%	6%	0%		2.8%	-
Buses	0	0	0		0	0	0	0		0	0	0	0		0	-
Buses %	0%	0%	0%		0%	0%	0%	0%		0%	0%	0%	0%		0%	-
Articulated Trucks	3	0	0		3	2	7	0		9	3	1	0		4	-
Articulated Trucks %	3.7%	0%	0%		3.5%	1.8%	2.3%	0%		2.2%	0.9%	1.5%	0%		1%	-
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	-
Bicycles on Road%	-	-	-	%		-	-	-	%		-	-	-	%		-

Peak Hour: 11:00 AM - 12:00 PM Weather:

Peak Hour: 04:45 PM - 05:45 PM Weather:

MMM Group Limited
MMM Group Limited
Thornhill ONTARIO, CANADA, L3T 0A1

Turning Movement Count (5 . COUNTY ROAD 22 & HIGHWAY 400 NORTH RAMP)

Start Time	N Approach HIGHWAY 400 SOUTHBOUND ON / OFF RAMP					E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)					W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)					Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Left N:E	U-Turn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	U-Turn E:E	Peds E:	Approach Total	Thru W:E	Left W:N	U-Turn W:W	Peds W:	Approach Total		
16:00:00	25	1	0	0	26	17	81	0	0	98	130	8	0	0	138	262	
16:15:00	9	2	0	0	11	16	76	0	0	92	145	10	0	0	155	258	
16:30:00	23	2	0	0	25	24	76	0	0	100	135	16	0	0	151	276	
16:45:00	25	3	0	0	28	16	88	0	0	104	129	12	0	0	141	273	1069
17:00:00	12	1	0	0	13	14	72	0	0	86	142	12	0	0	154	253	1060
17:15:00	20	2	0	0	22	27	80	0	0	107	118	12	0	0	130	259	1061
17:30:00	17	0	0	0	17	14	69	0	0	83	112	14	0	0	126	226	1011
17:45:00	20	1	0	0	21	21	65	0	0	86	126	9	0	0	135	242	980
18:00:00	18	0	0	0	18	17	51	0	0	68	125	10	0	0	135	221	948
18:15:00	12	1	0	0	13	12	53	0	0	65	108	12	0	0	120	198	887
18:30:00	20	1	0	0	21	12	45	0	0	57	122	5	0	0	127	205	866
18:45:00	10	0	0	0	10	20	57	0	0	77	106	3	0	0	109	196	820
Grand Total	211	14	0	0	225	210	813	0	0	1023	1498	123	0	0	1621	**2869**	-
Approach%	93.8%	6.2%	0%		-	20.5%	79.5%	0%		-	92.4%	7.6%	0%		-	-	-
Totals %	7.4%	0.5%	0%		7.8%	7.3%	28.3%	0%		35.7%	52.2%	4.3%	0%		56.5%	-	-
Heavy	13	1	0		-	3	19	0		-	42	6	0		-	-	-
Heavy %	6.2%	7.1%	0%		-	1.4%	2.3%	0%		-	2.8%	4.9%	0%		-	-	-
Bicycles	0	0	0		-	0	0	0		-	1	0	0		-	-	-
Bicycle %	0%	0%	0%		-	0%	0%	0%		-	0.1%	0%	0%		-	-	-

Peak Hour: 04:00 PM - 05:00 PM Weather:

Start Time	N Approach HIGHWAY 400 SOUTHBOUND ON / OFF RAMP					E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)					W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)					Int. Total (15 min)
	Right	Left	U-Turn	Peds	Approach Total	Right	Thru	U-Turn	Peds	Approach Total	Thru	Left	U-Turn	Peds	Approach Total	
16:00:00	25	1	0	0	26	17	81	0	0	98	130	8	0	0	138	262
16:15:00	9	2	0	0	11	16	76	0	0	92	145	10	0	0	155	258
16:30:00	23	2	0	0	25	24	76	0	0	100	135	16	0	0	151	276
16:45:00	25	3	0	0	28	16	88	0	0	104	129	12	0	0	141	273
Grand Total	82	8	0	0	90	73	321	0	0	394	539	46	0	0	585	**1069**
Approach%	91.1%	8.9%	0%		-	18.5%	81.5%	0%		-	92.1%	7.9%	0%		-	-
Totals %	7.7%	0.7%	0%		8.4%	6.8%	30%	0%		36.9%	50.4%	4.3%	0%		54.7%	-
PHF	0.82	0.67	0		0.8	0.76	0.91	0		0.95	0.93	0.72	0		0.94	-
Heavy	4	1	0		5	2	11	0		13	16	5	0		21	-
Heavy %	4.9%	12.5%	0%		5.6%	2.7%	3.4%	0%		3.3%	3%	10.9%	0%		3.6%	-
Lights	78	7	0		85	71	310	0		381	523	41	0		564	-
Lights %	95.1%	87.5%	0%		94.4%	97.3%	96.6%	0%		96.7%	97%	89.1%	0%		96.4%	-
Single-Unit Trucks	2	1	0		3	1	10	0		11	9	3	0		12	-
Single-Unit Trucks %	2.4%	12.5%	0%		3.3%	1.4%	3.1%	0%		2.8%	1.7%	6.5%	0%		2.1%	-
Buses	0	0	0		0	1	1	0		2	0	0	0		0	-
Buses %	0%	0%	0%		0%	1.4%	0.3%	0%		0.5%	0%	0%	0%		0%	-
Articulated Trucks	2	0	0		2	0	0	0		0	7	2	0		9	-
Articulated Trucks %	2.4%	0%	0%		2.2%	0%	0%	0%		0%	1.3%	4.3%	0%		1.5%	-
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	1	0	0	0	-	-
Bicycles on Road%	-	-	-	%		-	-	-	%		-	-	-	%		-

Peak Hour: 04:00 PM - 05:00 PM Weather:

Turning Movement Count (6 . COUNTY ROAD 22 & HIGHWAY 400 SOUTH RAMP)

Start Time	N Approach DRIVEWAY						E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						S Approach COUNTY ROAD 22 & HIGHWAY 400 NORTHBOUND ON / OFF R						W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	U-Turn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	U-Turn W:W	Peds W:	Approach Total		
07:00:00	0	1	0	0	0	1	0	46	1	0	0	47	17	1	8	0	0	26	3	18	0	0	0	21	95	
07:15:00	0	0	0	0	0	0	0	49	0	0	0	49	19	0	4	0	0	23	6	29	0	0	0	35	107	
07:30:00	0	0	0	0	0	0	0	50	1	0	0	51	10	0	7	0	0	17	6	37	0	0	0	43	111	
07:45:00	0	0	0	0	0	0	0	62	2	0	0	64	29	0	6	0	0	35	6	36	0	0	0	42	141	454
08:00:00	0	0	0	0	0	0	0	62	1	0	0	63	18	0	7	0	0	25	10	37	0	0	0	47	135	494
08:15:00	0	0	0	0	0	0	0	58	0	0	0	58	31	0	8	2	0	41	11	41	0	0	0	52	151	538
08:30:00	0	0	0	0	0	0	0	62	3	0	0	65	19	0	10	0	0	29	6	31	0	0	0	37	131	558
08:45:00	0	0	0	0	0	0	0	45	1	0	0	46	18	0	9	0	0	27	10	34	0	0	0	44	117	534
09:00:00	1	0	0	0	0	1	0	51	2	0	0	53	24	1	7	0	0	32	11	34	1	0	0	46	132	531
09:15:00	0	0	0	0	0	0	0	59	2	0	0	61	26	0	7	0	0	33	15	39	0	0	0	54	148	528
09:30:00	1	0	0	0	0	1	0	57	3	0	0	60	16	0	14	0	0	30	14	29	1	0	0	44	135	532
09:45:00	0	0	0	0	0	0	1	57	0	0	0	58	20	0	20	0	0	40	9	33	0	0	0	42	140	555
10:00:00	0	0	0	0	0	0	0	63	0	0	0	63	14	0	7	1	0	22	22	48	0	0	0	70	155	578
10:15:00	0	0	0	0	0	0	0	47	2	0	0	49	18	0	16	0	0	34	16	36	0	0	0	52	135	565
10:30:00	1	0	0	0	0	1	0	70	2	0	0	72	15	0	8	0	0	23	14	44	1	0	0	59	155	585
10:45:00	0	0	0	0	0	0	0	70	2	0	0	72	24	0	8	0	0	32	6	47	0	0	0	53	157	602
11:00:00	0	0	0	0	0	0	0	82	2	0	0	84	28	0	16	0	0	44	19	35	0	0	0	54	182	629
11:15:00	0	0	0	0	0	0	1	72	2	0	0	75	26	0	17	0	0	43	15	35	0	0	0	50	168	662
11:30:00	0	0	2	0	0	2	0	54	8	0	0	62	26	0	15	0	0	41	12	36	0	0	0	48	153	660
11:45:00	0	0	0	0	0	0	0	61	1	0	0	62	28	0	14	0	0	42	21	31	0	1	0	53	157	660
BREAK																										
16:00:00	0	0	0	0	0	0	0	78	1	0	0	79	29	0	22	0	0	51	23	54	0	0	0	77	207	
16:15:00	0	0	0	0	0	0	0	60	4	0	0	64	45	0	19	0	0	64	15	63	0	0	0	78	206	
16:30:00	0	0	0	0	0	0	0	78	4	0	0	82	41	0	16	0	0	57	23	57	0	0	0	80	219	
16:45:00	1	0	0	0	0	1	0	81	0	0	0	81	48	0	31	0	0	79	24	66	1	0	0	91	252	884
17:00:00	0	0	0	0	0	0	0	90	7	0	0	97	50	0	21	0	0	71	21	62	0	0	0	83	251	928
17:15:00	2	0	0	0	0	2	0	57	7	0	0	64	43	0	24	0	0	67	20	56	1	0	0	77	210	932
17:30:00	0	0	0	0	0	0	0	78	3	0	0	81	37	0	31	0	0	68	27	55	0	0	0	82	231	944
17:45:00	0	0	0	0	0	0	0	43	3	0	0	46	50	0	20	0	0	70	20	49	0	0	0	69	185	877
18:00:00	0	0	0	0	0	0	0	53	2	0	0	55	37	0	18	0	0	55	20	32	0	0	0	52	162	788
18:15:00	0	0	0	0	0	0	0	39	1	0	0	40	24	0	8	0	0	32	15	53	0	0	0	68	140	718

18:30:00	0	0	0	0	0	0	0	42	1	0	0	43	23	0	9	0	0	32	14	29	0	0	0	43	118	605
18:45:00	0	0	0	0	0	0	0	44	0	0	0	44	17	0	3	0	0	20	15	28	0	0	0	43	107	527
Grand Total	6	1	2	0	0	9	2	1920	68	0	0	1990	870	2	430	3	0	1305	469	1314	5	1	0	1789	**5093**	-
Approach%	66.7%	11.1%	22.2%	0%		-	0.1%	96.5%	3.4%	0%		-	66.7%	0.2%	33%	0.2%		-	26.2%	73.4%	0.3%	0.1%		-	-	-
Totals %	0.1%	0%	0%	0%		0.2%	0%	37.7%	1.3%	0%		39.1%	17.1%	0%	8.4%	0.1%		25.6%	9.2%	25.8%	0.1%	0%		35.1%	-	-
Heavy	2	0	0	0		-	0	141	7	0		-	121	0	31	2		-	38	99	0	0		-	-	-
Heavy %	33.3%	0%	0%	0%		-	0%	7.3%	10.3%	0%		-	13.9%	0%	7.2%	66.7%		-	8.1%	7.5%	0%	0%		-	-	-
Bicycles	0	0	0	0		-	0	0	0	0		-	0	0	0	0		-	0	2	0	0		-	-	-
Bicycle %	0%	0%	0%	0%		-	0%	0%	0%	0%		-	0%	0%	0%	0%		-	0%	0.2%	0%	0%		-	-	-

Peak Hour: 10:30 AM - 11:30 AM Weather:

Start Time	N Approach DRIVEWAY						E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						S Approach COUNTY ROAD 22 & HIGHWAY 400 NORTHBOUND ON / OFF R						W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
10:30:00	1	0	0	0	0	1	0	70	2	0	0	72	15	0	8	0	0	23	14	44	1	0	0	59	155
10:45:00	0	0	0	0	0	0	0	70	2	0	0	72	24	0	8	0	0	32	6	47	0	0	0	53	157
11:00:00	0	0	0	0	0	0	0	82	2	0	0	84	28	0	16	0	0	44	19	35	0	0	0	54	182
11:15:00	0	0	0	0	0	0	1	72	2	0	0	75	26	0	17	0	0	43	15	35	0	0	0	50	168
Grand Total	1	0	0	0	0	1	1	294	8	0	0	303	93	0	49	0	0	142	54	161	1	0	0	216	**662**
Approach%	100%	0%	0%	0%		-	0.3%	97%	2.6%	0%		-	65.5%	0%	34.5%	0%		-	25%	74.5%	0.5%	0%		-	**-**
Totals %	0.2%	0%	0%	0%		0.2%	0.2%	44.4%	1.2%	0%		45.8%	14%	0%	7.4%	0%		21.5%	8.2%	24.3%	0.2%	0%		32.6%	**-**
PHF	0.25	0	0	0		0.25	0.25	0.9	1	0		0.9	0.83	0	0.72	0		0.81	0.71	0.86	0.25	0		0.92	**-**
Heavy	1	0	0	0		1	0	27	1	0		28	16	0	4	0		20	5	18	0	0		23	**-**
Heavy %	100%	0%	0%	0%		100%	0%	9.2%	12.5%	0%		9.2%	17.2%	0%	8.2%	0%		14.1%	9.3%	11.2%	0%	0%		10.6%	**-**
Lights	0	0	0	0		0	1	267	7	0		275	77	0	45	0		122	49	143	1	0		193	**-**
Lights %	0%	0%	0%	0%		0%	100%	90.8%	87.5%	0%		90.8%	82.8%	0%	91.8%	0%		85.9%	90.7%	88.8%	100%	0%		89.4%	**-**
Single-Unit Trucks	1	0	0	0		1	0	20	1	0		21	9	0	0	0		9	2	12	0	0		14	**-**
Single-Unit Trucks %	100%	0%	0%	0%		100%	0%	6.8%	12.5%	0%		6.9%	9.7%	0%	0%	0%		6.3%	3.7%	7.5%	0%	0%		6.5%	**-**
Buses	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	0	0	0	0		0	**-**
Buses %	0%	0%	0%	0%		0%	0%	0.3%	0%	0%		0.3%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Articulated Trucks	0	0	0	0		0	0	6	0	0		6	7	0	4	0		11	3	6	0	0		9	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	0%	2%	0%	0%		2%	7.5%	0%	8.2%	0%		7.7%	5.6%	3.7%	0%	0%		4.2%	**-**
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	-	%		-	-	-	-	%		-	-	-	-	%		-	-	-	-	%		**-**

Peak Hour: 04:45 PM - 05:45 PM Weather:

Start Time	N Approach DRIVEWAY						E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						S Approach COUNTY ROAD 22 & HIGHWAY 400 NORTHBOUND ON / OFF R						W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
16:45:00	1	0	0	0	0	1	0	81	0	0	0	81	48	0	31	0	0	79	24	66	1	0	0	91	252
17:00:00	0	0	0	0	0	0	0	90	7	0	0	97	50	0	21	0	0	71	21	62	0	0	0	83	251
17:15:00	2	0	0	0	0	2	0	57	7	0	0	64	43	0	24	0	0	67	20	56	1	0	0	77	210
17:30:00	0	0	0	0	0	0	0	78	3	0	0	81	37	0	31	0	0	68	27	55	0	0	0	82	231
Grand Total	3	0	0	0	0	3	0	306	17	0	0	323	178	0	107	0	0	285	92	239	2	0	0	333	**944**
Approach%	100%	0%	0%	0%		-	0%	94.7%	5.3%	0%		-	62.5%	0%	37.5%	0%		-	27.6%	71.8%	0.6%	0%		-	**-**
Totals %	0.3%	0%	0%	0%		0.3%	0%	32.4%	1.8%	0%		34.2%	18.9%	0%	11.3%	0%		30.2%	9.7%	25.3%	0.2%	0%		35.3%	**-**
PHF	0.38	0	0	0		0.38	0	0.85	0.61	0		0.83	0.89	0	0.86	0		0.9	0.85	0.91	0.5	0		0.91	**-**
Heavy	1	0	0	0		1	0	14	1	0		15	4	0	1	0		5	1	8	0	0		9	**-**
Heavy %	33.3%	0%	0%	0%		33.3%	0%	4.6%	5.9%	0%		4.6%	2.2%	0%	0.9%	0%		1.8%	1.1%	3.3%	0%	0%		2.7%	**-**
Lights	2	0	0	0		2	0	292	16	0		308	174	0	106	0		280	91	231	2	0		324	**-**
Lights %	66.7%	0%	0%	0%		66.7%	0%	95.4%	94.1%	0%		95.4%	97.8%	0%	99.1%	0%		98.2%	98.9%	96.7%	100%	0%		97.3%	**-**
Single-Unit Trucks	1	0	0	0		1	0	5	1	0		6	4	0	1	0		5	1	5	0	0		6	**-**
Single-Unit Trucks %	33.3%	0%	0%	0%		33.3%	0%	1.6%	5.9%	0%		1.9%	2.2%	0%	0.9%	0%		1.8%	1.1%	2.1%	0%	0%		1.8%	**-**
Buses	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	**-**
Buses %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Articulated Trucks	0	0	0	0		0	0	9	0	0		9	0	0	0	0		0	0	3	0	0		3	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	0%	2.9%	0%	0%		2.8%	0%	0%	0%	0%		0%	0%	1.3%	0%	0%		0.9%	**-**
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	-	%		-	-	-	-	%		-	-	-	-	%		-	-	-	-	%		**-**

Peak Hour: 10:30 AM - 11:30 AM Weather:

Peak Hour: 04:45 PM - 05:45 PM Weather:

MMM Group Limited
MMM Group Limited
Thornhill ONTARIO, CANADA, L3T 0A1

Turning Movement Count (6 . COUNTY ROAD 22 & HIGHWAY 400 SOUTH RAMP)

Start Time	N Approach DRIVEWAY						E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						S Approach HIGHWAY 400 NORTHBOUND ON / OFF RAMP						W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	U-Turn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	U-Turn W:W	Peds W:	Approach Total		
16:00:00	0	0	0	0	0	0	0	80	5	0	0	85	23	0	19	0	0	42	53	81	0	0	0	134	261	
16:15:00	1	0	0	0	0	1	0	65	5	0	0	70	34	1	21	0	0	56	61	82	0	1	0	144	271	
16:30:00	0	0	0	0	0	0	0	79	5	0	0	84	34	0	24	1	0	59	55	79	0	0	0	134	277	
16:45:00	0	0	0	0	0	0	0	82	5	0	0	87	42	0	19	0	0	61	58	75	0	0	0	133	281	1090
17:00:00	0	0	0	0	0	0	1	71	4	0	0	76	40	0	20	0	0	60	64	77	0	0	0	141	277	1106
17:15:00	0	0	1	0	0	1	0	76	5	0	0	81	40	0	20	0	0	60	51	71	0	0	0	122	264	1099
17:30:00	0	0	0	0	0	0	0	67	3	0	0	70	39	0	22	0	0	61	55	63	1	0	0	119	250	1072
17:45:00	0	0	1	0	0	1	1	63	3	0	0	67	22	0	21	0	0	43	54	75	0	0	0	129	240	1031
18:00:00	0	0	1	0	0	1	1	57	4	0	0	62	16	0	14	1	0	31	53	69	1	0	0	123	217	971
18:15:00	0	0	1	0	0	1	0	53	4	0	0	57	18	0	14	0	0	32	56	55	0	0	0	111	201	908
18:30:00	0	0	0	0	0	0	0	34	4	0	0	38	26	0	18	0	0	44	69	56	0	0	0	125	207	865
18:45:00	0	0	0	0	0	0	0	62	2	0	0	64	19	0	15	0	0	34	53	52	0	0	0	105	203	828
Grand Total	1	0	4	0	0	5	3	789	49	0	0	841	353	1	227	2	0	583	682	835	2	1	0	1520	**2949**	-
Approach%	20%	0%	80%	0%		-	0.4%	93.8%	5.8%	0%		-	60.5%	0.2%	38.9%	0.3%		-	44.9%	54.9%	0.1%	0.1%		-	**-**	-
Totals %	0%	0%	0.1%	0%		0.2%	0.1%	26.8%	1.7%	0%		28.5%	12%	0%	7.7%	0.1%		19.8%	23.1%	28.3%	0.1%	0%		51.5%	**-**	-
Heavy	0	0	0	0		-	1	16	0	0		-	3	0	5	0		-	13	33	0	0		-	**-**	-
Heavy %	0%	0%	0%	0%		-	33.3%	2%	0%	0%		-	0.8%	0%	2.2%	0%		-	1.9%	4%	0%	0%		-	**-**	-
Bicycles	0	0	0	0		-	0	0	0	0		-	0	0	0	0		-	0	1	0	0		-	**-**	-
Bicycle %	0%	0%	0%	0%		-	0%	0%	0%	0%		-	0%	0%	0%	0%		-	0%	0.1%	0%	0%		-	**-**	-

Peak Hour: 04:15 PM - 05:15 PM Weather:

Start Time	N Approach DRIVEWAY						E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						S Approach HIGHWAY 400 NORTHBOUND ON / OFF RAMP						W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
16:15:00	1	0	0	0	0	1	0	65	5	0	0	70	34	1	21	0	0	56	61	82	0	1	0	144	271
16:30:00	0	0	0	0	0	0	0	79	5	0	0	84	34	0	24	1	0	59	55	79	0	0	0	134	277
16:45:00	0	0	0	0	0	0	0	82	5	0	0	87	42	0	19	0	0	61	58	75	0	0	0	133	281
17:00:00	0	0	0	0	0	0	1	71	4	0	0	76	40	0	20	0	0	60	64	77	0	0	0	141	277
Grand Total	1	0	0	0	0	1	1	297	19	0	0	317	150	1	84	1	0	236	238	313	0	1	0	552	**1106**
Approach%	100%	0%	0%	0%		-	0.3%	93.7%	6%	0%		-	63.6%	0.4%	35.6%	0.4%		-	43.1%	56.7%	0%	0.2%		-	**-**
Totals %	0.1%	0%	0%	0%		0.1%	0.1%	26.9%	1.7%	0%		28.7%	13.6%	0.1%	7.6%	0.1%		21.3%	21.5%	28.3%	0%	0.1%		49.9%	**-**
PHF	0.25	0	0	0		0.25	0.25	0.91	0.95	0		0.91	0.89	0.25	0.88	0.25		0.97	0.93	0.95	0	0.25		0.96	**-**
Heavy	0	0	0	0		0	0	8	0	0		8	2	0	2	0		4	6	11	0	0		17	**-**
Heavy %	0%	0%	0%	0%		0%	0%	2.7%	0%	0%		2.5%	1.3%	0%	2.4%	0%		1.7%	2.5%	3.5%	0%	0%		3.1%	**-**
Lights	1	0	0	0		1	1	289	19	0		309	148	1	82	1		232	232	302	0	1		535	**-**
Lights %	100%	0%	0%	0%		100%	100%	97.3%	100%	0%		97.5%	98.7%	100%	97.6%	100%		98.3%	97.5%	96.5%	0%	100%		96.9%	**-**
Single-Unit Trucks	0	0	0	0		0	0	5	0	0		5	2	0	2	0		4	4	6	0	0		10	**-**
Single-Unit Trucks %	0%	0%	0%	0%		0%	0%	1.7%	0%	0%		1.6%	1.3%	0%	2.4%	0%		1.7%	1.7%	1.9%	0%	0%		1.8%	**-**
Buses	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	0	0	0	0		0	**-**
Buses %	0%	0%	0%	0%		0%	0%	0.3%	0%	0%		0.3%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Articulated Trucks	0	0	0	0		0	0	2	0	0		2	0	0	0	0		0	2	5	0	0		7	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0.7%	0%	0%		0.6%	0%	0%	0%	0%		0%	0.8%	1.6%	0%	0%		1.3%	**-**
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1	0	0	0	-	**-**
Bicycles on Road%	-	-	-	-	%		-	-	-	-	%		-	-	-	-	%		-	-	-	-	%		**-**

Peak Hour: 04:15 PM - 05:15 PM Weather:

MMM Group Limited
MMM Group Limited
Thornhill ONTARIO, CANADA, L3T 0A1

Turning Movement Count (1 . COUNTY ROAD 22 (HORSESHOE VALLEY RD W) & COUNTY ROAD 27)

Start Time	N Approach COUNTY ROAD 27						E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						S Approach COUNTY ROAD 27						W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	U-Turn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	U-Turn W:W	Peds W:	Approach Total		
07:00:00	5	75	15	0	0	95	9	23	6	0	0	38	4	30	1	0	0	35	13	22	3	0	0	38	206	
07:15:00	3	101	12	0	0	116	4	25	8	0	2	37	3	33	3	0	0	39	3	30	2	0	0	35	227	
07:30:00	8	88	15	0	0	111	6	22	12	0	0	40	8	44	5	0	0	57	6	28	4	0	0	38	246	
07:45:00	12	81	16	0	0	109	6	21	10	0	0	37	13	29	2	0	0	44	6	31	8	0	0	45	235	914
08:00:00	8	87	21	0	0	116	9	21	25	0	0	55	17	29	3	0	0	49	5	30	7	0	0	42	262	970
08:15:00	10	88	13	0	0	111	10	22	11	0	0	43	10	37	5	0	0	52	7	33	6	0	0	46	252	995
08:30:00	9	96	15	0	0	120	13	28	7	0	0	48	10	36	7	0	0	53	6	30	6	0	0	42	263	1012
08:45:00	6	81	21	0	0	108	5	21	9	0	0	35	9	44	4	0	0	57	10	32	5	0	0	47	247	1024
09:00:00	7	67	17	0	0	91	9	24	9	0	0	42	7	43	7	0	0	57	7	41	6	0	1	54	244	1006
09:15:00	8	70	14	0	0	92	15	25	13	0	2	53	9	52	6	0	0	67	6	29	14	0	4	49	261	1015
09:30:00	3	83	14	0	0	100	21	36	8	0	0	65	6	53	5	0	0	64	4	32	14	0	0	50	279	1031
09:45:00	8	68	11	0	0	87	19	37	13	0	0	69	9	57	3	0	0	69	5	40	5	0	0	50	275	1059
10:00:00	6	73	12	0	0	91	10	29	14	0	1	53	9	70	7	0	0	86	6	53	5	0	0	64	294	1109
10:15:00	10	78	20	0	0	108	13	33	6	0	0	52	6	61	4	0	0	71	9	39	10	0	0	58	289	1137
10:30:00	5	71	18	0	0	94	11	29	16	0	0	56	7	78	8	0	0	93	1	43	11	0	0	55	298	1156
10:45:00	3	70	16	0	0	89	27	23	13	0	0	63	4	104	3	0	0	111	6	49	8	0	0	63	326	1207
11:00:00	10	68	12	0	0	90	15	51	6	0	0	72	13	78	3	0	0	94	5	38	15	0	0	58	314	1227
11:15:00	10	76	13	0	0	99	15	49	6	0	0	70	12	85	8	0	0	105	3	25	7	0	0	35	309	1247
11:30:00	5	75	15	0	0	95	17	38	14	0	0	69	19	92	4	0	0	115	6	37	8	0	0	51	330	1279
11:45:00	11	68	9	0	0	88	19	36	18	0	0	73	14	98	8	0	0	120	2	35	8	0	0	45	326	1279
BREAK																										
16:00:00	5	83	18	0	0	106	16	59	9	0	0	84	24	97	7	0	0	128	1	42	9	0	0	52	370	
16:15:00	9	66	22	0	0	97	10	55	8	0	0	73	22	124	10	0	0	156	5	41	11	0	0	57	383	
16:30:00	8	96	10	0	0	114	19	56	11	0	0	86	21	94	4	0	0	119	7	65	13	0	0	85	404	
16:45:00	8	82	21	0	0	111	21	55	9	0	0	85	29	126	2	0	0	157	5	57	14	0	0	76	429	1586
17:00:00	5	82	15	0	0	102	23	46	14	0	0	83	29	108	6	0	0	143	4	50	10	0	0	64	392	1608
17:15:00	9	71	19	0	0	99	24	45	11	0	0	80	20	119	5	0	0	144	6	54	14	0	0	74	397	1622
17:30:00	10	60	15	0	0	85	19	44	18	0	0	81	18	107	2	0	0	127	2	56	8	0	0	66	359	1577
17:45:00	17	80	14	0	0	111	16	43	5	0	0	64	22	94	7	0	0	123	3	37	8	0	0	48	346	1494
18:00:00	10	72	11	0	0	93	11	37	11	0	0	59	19	90	1	0	0	110	10	29	10	0	0	49	311	1413
18:15:00	6	74	11	0	0	91	15	36	13	0	0	64	13	86	5	0	0	104	3	50	6	0	0	59	318	1334

18:30:00	8	50	11	0	0	69	6	24	7	0	0	37	9	77	3	0	0	89	4	36	4	0	0	44	239	1214
18:45:00	9	58	13	0	0	80	8	24	8	0	0	40	14	74	5	0	0	93	12	23	7	0	0	42	255	1123
Grand Total	251	2438	479	0	0	3168	441	1117	348	0	5	1906	429	2349	153	0	0	2931	178	1237	266	0	5	1681	**9686**	-
Approach%	7.9%	77%	15.1%	0%		-	23.1%	58.6%	18.3%	0%		-	14.6%	80.1%	5.2%	0%		-	10.6%	73.6%	15.8%	0%		-	**-**	-
Totals %	2.6%	25.2%	4.9%	0%		32.7%	4.6%	11.5%	3.6%	0%		19.7%	4.4%	24.3%	1.6%	0%		30.3%	1.8%	12.8%	2.7%	0%		17.4%	**-**	-
Heavy	14	58	40	0		-	36	78	21	0		-	30	75	35	0		-	28	113	21	0		-	**-**	-
Heavy %	5.6%	2.4%	8.4%	0%		-	8.2%	7%	6%	0%		-	7%	3.2%	22.9%	0%		-	15.7%	9.1%	7.9%	0%		-	**-**	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-

MMM Group Limited
MMM Group Limited
Thornhill ONTARIO, CANADA, L3T 0A1

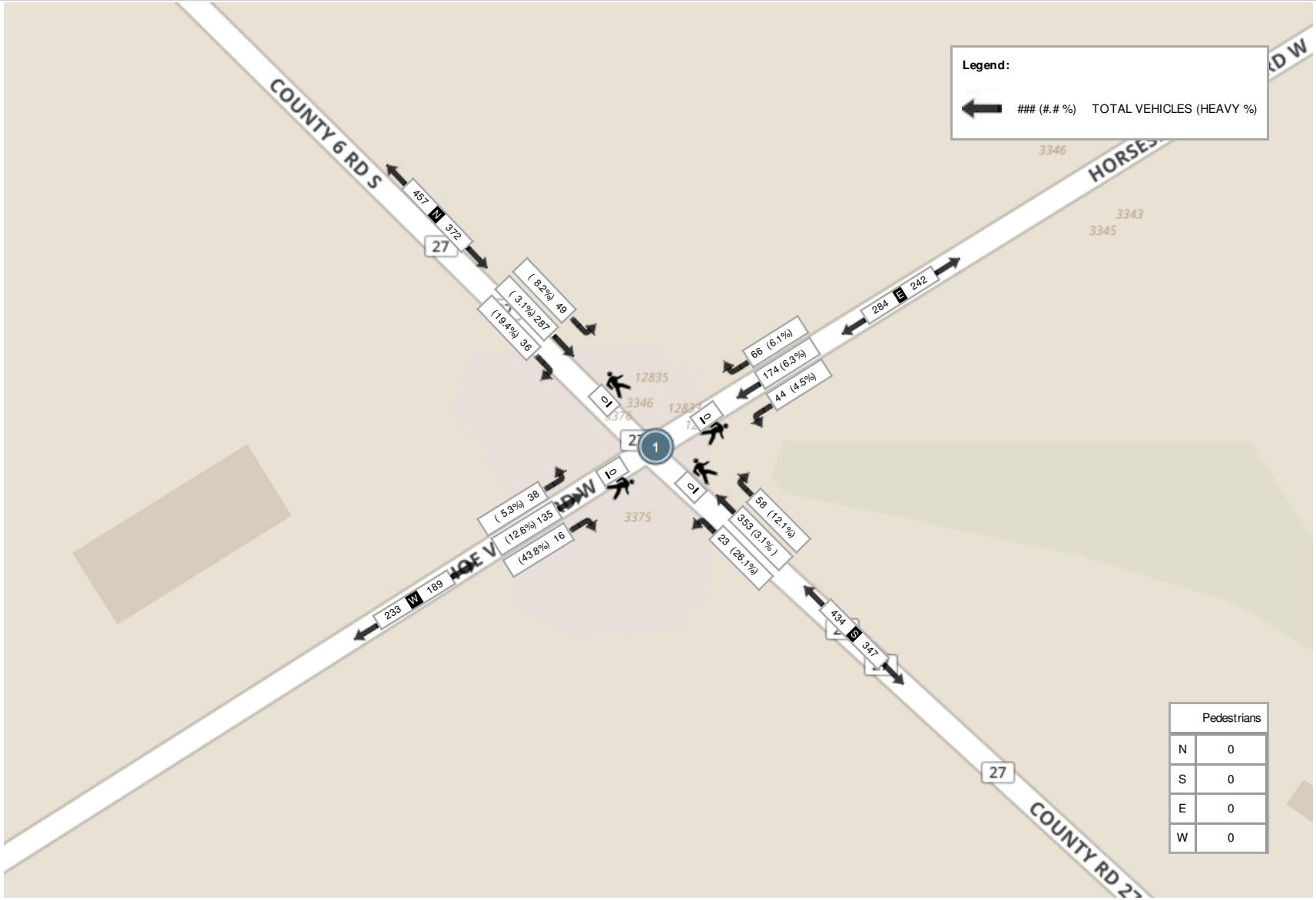
Peak Hour: 11:00 AM - 12:00 PM Weather:

Start Time	N Approach COUNTY ROAD 27						E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						S Approach COUNTY ROAD 27						W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
11:00:00	10	68	12	0	0	90	15	51	6	0	0	72	13	78	3	0	0	94	5	38	15	0	0	58	314
11:15:00	10	76	13	0	0	99	15	49	6	0	0	70	12	85	8	0	0	105	3	25	7	0	0	35	309
11:30:00	5	75	15	0	0	95	17	38	14	0	0	69	19	92	4	0	0	115	6	37	8	0	0	51	330
11:45:00	11	68	9	0	0	88	19	36	18	0	0	73	14	98	8	0	0	120	2	35	8	0	0	45	326
Grand Total	36	287	49	0	0	372	66	174	44	0	0	284	58	353	23	0	0	434	16	135	38	0	0	189	**1279**
Approach%	9.7%	77.2%	13.2%	0%		-	23.2%	61.3%	15.5%	0%		-	13.4%	81.3%	5.3%	0%		-	8.5%	71.4%	20.1%	0%		-	-
Totals %	2.8%	22.4%	3.8%	0%		29.1%	5.2%	13.6%	3.4%	0%		22.2%	4.5%	27.6%	1.8%	0%		33.9%	1.3%	10.6%	3%	0%		14.8%	-
PHF	0.82	0.94	0.82	0		0.94	0.87	0.85	0.61	0		0.97	0.76	0.9	0.72	0		0.9	0.67	0.89	0.63	0		0.81	-
Heavy	7	9	4	0		20	4	11	2	0		17	7	11	6	0		24	7	17	2	0		26	-
Heavy %	19.4%	3.1%	8.2%	0%		5.4%	6.1%	6.3%	4.5%	0%		6%	12.1%	3.1%	26.1%	0%		5.5%	43.8%	12.6%	5.3%	0%		13.8%	-
Lights	29	278	45	0		352	62	163	42	0		267	51	342	17	0		410	9	118	36	0		163	-
Lights %	80.6%	96.9%	91.8%	0%		94.6%	93.9%	93.7%	95.5%	0%		94%	87.9%	96.9%	73.9%	0%		94.5%	56.3%	87.4%	94.7%	0%		86.2%	-
Single-Unit Trucks	5	4	3	0		12	2	5	2	0		9	3	6	3	0		12	4	6	1	0		11	-
Single-Unit Trucks %	13.9%	1.4%	6.1%	0%		3.2%	3%	2.9%	4.5%	0%		3.2%	5.2%	1.7%	13%	0%		2.8%	25%	4.4%	2.6%	0%		5.8%	-
Buses	0	0	0	0		0	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	-
Buses %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0.3%	0%	0%		0.2%	0%	0%	0%	0%		0%	-
Articulated Trucks	2	5	1	0		8	2	6	0	0		8	4	4	3	0		11	3	11	1	0		15	-
Articulated Trucks %	5.6%	1.7%	2%	0%		2.2%	3%	3.4%	0%	0%		2.8%	6.9%	1.1%	13%	0%		2.5%	18.8%	8.1%	2.6%	0%		7.9%	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-

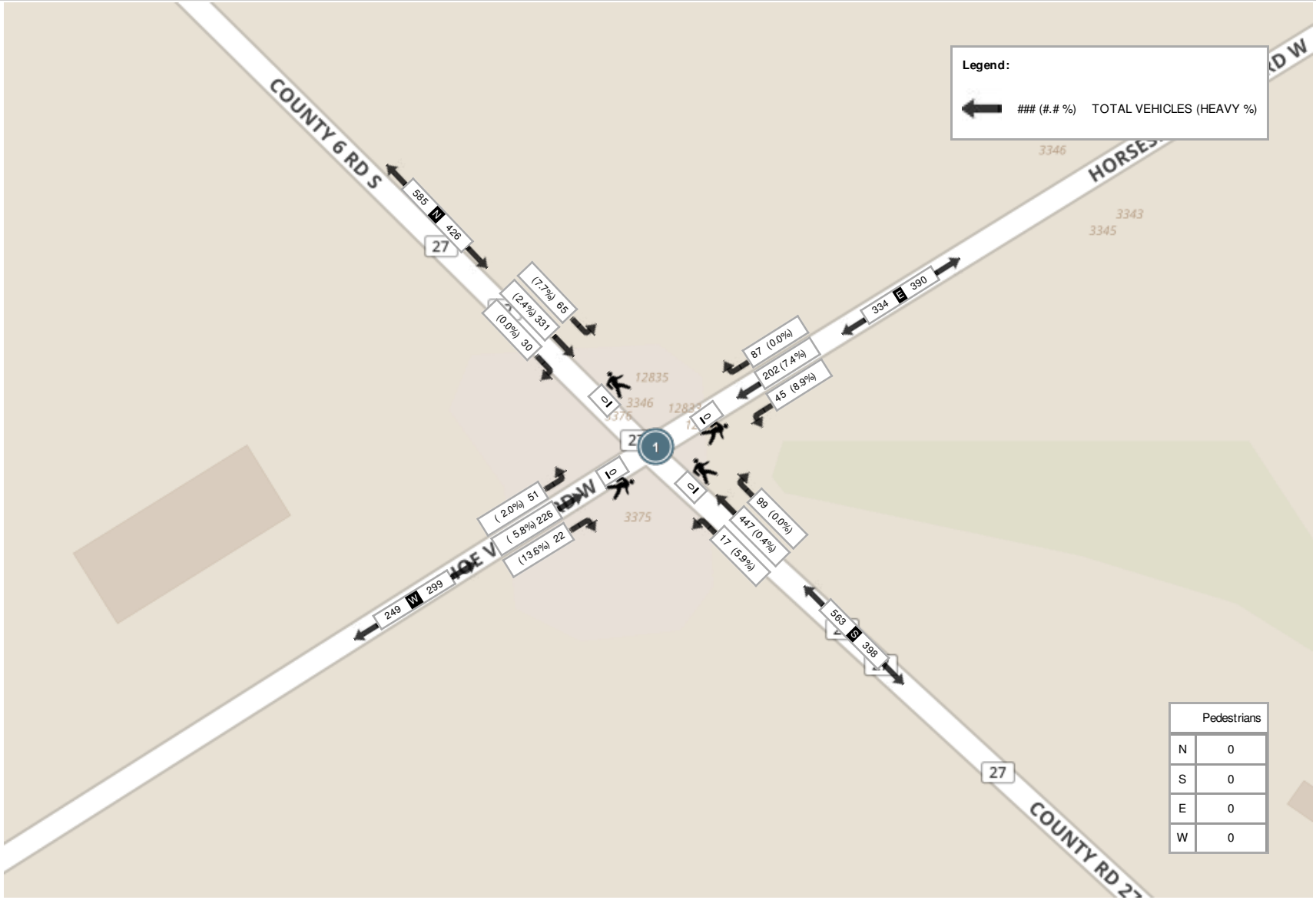
Peak Hour: 04:30 PM - 05:30 PM Weather:

Start Time	N Approach COUNTY ROAD 27						E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						S Approach COUNTY ROAD 27						W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
16:30:00	8	96	10	0	0	114	19	56	11	0	0	86	21	94	4	0	0	119	7	65	13	0	0	85	404
16:45:00	8	82	21	0	0	111	21	55	9	0	0	85	29	126	2	0	0	157	5	57	14	0	0	76	429
17:00:00	5	82	15	0	0	102	23	46	14	0	0	83	29	108	6	0	0	143	4	50	10	0	0	64	392
17:15:00	9	71	19	0	0	99	24	45	11	0	0	80	20	119	5	0	0	144	6	54	14	0	0	74	397
Grand Total	30	331	65	0	0	426	87	202	45	0	0	334	99	447	17	0	0	563	22	226	51	0	0	299	**1622**
Approach%	7%	77.7%	15.3%	0%		-	26%	60.5%	13.5%	0%		-	17.6%	79.4%	3%	0%		-	7.4%	75.6%	17.1%	0%		-	**-**
Totals %	1.8%	20.4%	4%	0%		26.3%	5.4%	12.5%	2.8%	0%		20.6%	6.1%	27.6%	1%	0%		34.7%	1.4%	13.9%	3.1%	0%		18.4%	**-**
PHF	0.83	0.86	0.77	0		0.93	0.91	0.9	0.8	0		0.97	0.85	0.89	0.71	0		0.9	0.79	0.87	0.91	0		0.88	**-**
Heavy	0	8	5	0		13	0	15	4	0		19	0	2	1	0		3	3	13	1	0		17	**-**
Heavy %	0%	2.4%	7.7%	0%		3.1%	0%	7.4%	8.9%	0%		5.7%	0%	0.4%	5.9%	0%		0.5%	13.6%	5.8%	2%	0%		5.7%	**-**
Lights	30	323	60	0		413	87	187	41	0		315	99	445	16	0		560	19	213	50	0		282	**-**
Lights %	100%	97.6%	92.3%	0%		96.9%	100%	92.6%	91.1%	0%		94.3%	100%	99.6%	94.1%	0%		99.5%	86.4%	94.2%	98%	0%		94.3%	**-**
Single-Unit Trucks	0	7	5	0		12	0	5	2	0		7	0	2	1	0		3	0	6	0	0		6	**-**
Single-Unit Trucks %	0%	2.1%	7.7%	0%		2.8%	0%	2.5%	4.4%	0%		2.1%	0%	0.4%	5.9%	0%		0.5%	0%	2.7%	0%	0%		2%	**-**
Buses	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	0	0	1	0		1	**-**
Buses %	0%	0%	0%	0%		0%	0%	0.5%	0%	0%		0.3%	0%	0%	0%	0%		0%	0%	0%	2%	0%		0.3%	**-**
Articulated Trucks	0	1	0	0		1	0	9	2	0		11	0	0	0	0		0	3	7	0	0		10	**-**
Articulated Trucks %	0%	0.3%	0%	0%		0.2%	0%	4.5%	4.4%	0%		3.3%	0%	0%	0%	0%		0%	13.6%	3.1%	0%	0%		3.3%	**-**
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

Peak Hour: 11:00 AM - 12:00 PM Weather:



Peak Hour: 04:30 PM - 05:30 PM **Weather:**



Spectrum

Turning Movement Count
Location Name: COUNTY ROAD 22 (HORSESHOE VALLEY RD W) & COUNTY ROAD 27
Date: Fri, Aug 05, 2016 Deployment Lead: Theo Daglis

MMM Group Limited
MMM Group Limited
Thornhill ONTARIO, CANADA, L3T 0A1

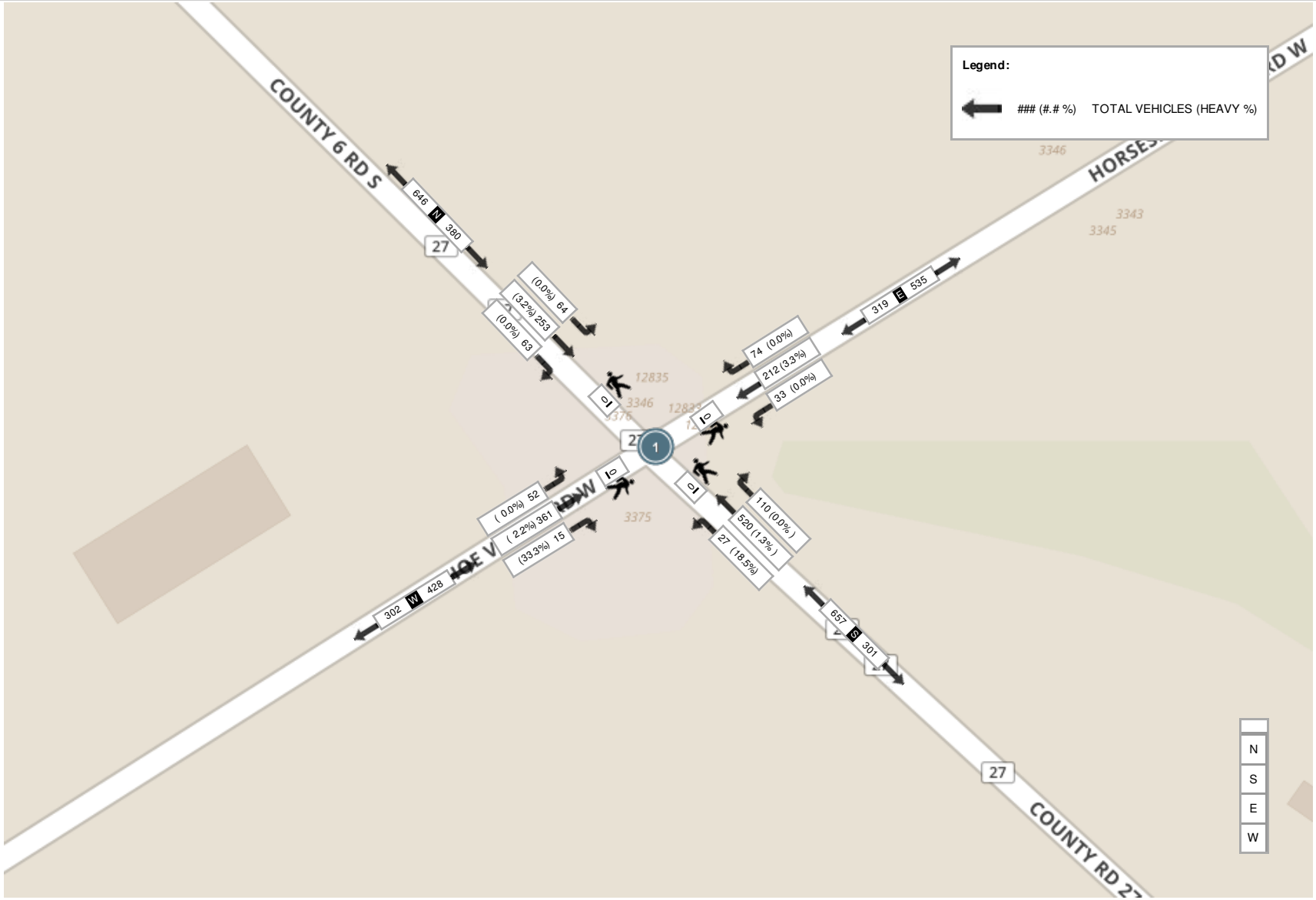
Turning Movement Count (1 . COUNTY ROAD 22 (HORSESHOE VALLEY RD W) & COUNTY ROAD 27)

Start Time	N Approach COUNTY ROAD 27						E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						S Approach COUNTY ROAD 27						W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	U-Turn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	U-Turn W:W	Peds W:	Approach Total		
16:00:00	7	43	14	0	0	64	20	65	7	0	0	92	19	128	6	0	0	153	3	105	16	0	0	124	433	
16:15:00	10	52	12	0	0	74	15	77	9	0	0	101	32	140	6	0	0	178	3	95	15	0	0	113	466	
16:30:00	8	54	21	0	0	83	21	54	8	0	0	83	22	121	8	0	0	151	3	95	15	0	0	113	430	
16:45:00	6	54	12	0	0	72	24	68	12	0	0	104	30	105	8	0	0	143	10	106	14	0	0	130	449	1778
17:00:00	9	64	13	0	0	86	14	45	10	0	0	69	24	127	7	0	0	158	5	100	13	0	0	118	431	1776
17:15:00	8	60	17	0	0	85	16	55	6	0	0	77	35	138	7	0	0	180	4	77	11	0	0	92	434	1744
17:30:00	23	58	14	0	0	95	20	62	7	0	0	89	26	122	6	0	0	154	3	83	13	0	0	99	437	1751
17:45:00	23	71	20	0	0	114	24	50	10	0	0	84	25	133	7	0	0	165	3	101	15	0	0	119	482	1784
18:00:00	7	53	10	0	0	70	12	43	4	0	0	59	30	134	3	0	0	167	3	90	14	0	0	107	403	1756
18:15:00	10	48	10	0	0	68	21	47	10	0	0	78	28	91	4	0	0	123	1	90	9	0	0	100	369	1691
18:30:00	4	62	8	0	0	74	11	37	8	0	0	56	19	82	5	0	0	106	4	70	7	0	0	81	317	1571
18:45:00	3	56	7	0	0	66	19	45	4	0	0	68	13	108	4	0	0	125	3	89	4	0	0	96	355	1444
Grand Total	118	675	158	0	0	951	217	648	95	0	0	960	303	1429	71	0	0	1803	45	1101	146	0	0	1292	**5006**	-
Approach%	12.4%	71%	16.6%	0%		-	22.6%	67.5%	9.9%	0%		-	16.8%	79.3%	3.9%	0%		-	3.5%	85.2%	11.3%	0%		-	**-**	-
Totals %	2.4%	13.5%	3.2%	0%		19%	4.3%	12.9%	1.9%	0%		19.2%	6.1%	28.5%	1.4%	0%		36%	0.9%	22%	2.9%	0%		25.8%	**-**	-
Heavy	1	19	3	0		-	2	24	2	0		-	1	11	10	0		-	12	38	1	0		-	**-**	-
Heavy %	0.8%	2.8%	1.9%	0%		-	0.9%	3.7%	2.1%	0%		-	0.3%	0.8%	14.1%	0%		-	26.7%	3.5%	0.7%	0%		-	**-**	-
Bicycles	0	0	0	0		-	0	0	0	0		-	0	2	0	0		-	0	0	0	0		-	**-**	-
Bicycle %	0%	0%	0%	0%		-	0%	0%	0%	0%		-	0%	0.1%	0%	0%		-	0%	0%	0%	0%		-	**-**	-

Peak Hour: 05:00 PM - 06:00 PM Weather:

Start Time	N Approach COUNTY ROAD 27						E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						S Approach COUNTY ROAD 27						W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
17:00:00	9	64	13	0	0	86	14	45	10	0	0	69	24	127	7	0	0	158	5	100	13	0	0	118	431
17:15:00	8	60	17	0	0	85	16	55	6	0	0	77	35	138	7	0	0	180	4	77	11	0	0	92	434
17:30:00	23	58	14	0	0	95	20	62	7	0	0	89	26	122	6	0	0	154	3	83	13	0	0	99	437
17:45:00	23	71	20	0	0	114	24	50	10	0	0	84	25	133	7	0	0	165	3	101	15	0	0	119	482
Grand Total	63	253	64	0	0	380	74	212	33	0	0	319	110	520	27	0	0	657	15	361	52	0	0	428	**1784**
Approach%	16.6%	66.6%	16.8%	0%		-	23.2%	66.5%	10.3%	0%		-	16.7%	79.1%	4.1%	0%		-	3.5%	84.3%	12.1%	0%		-	-
Totals %	3.5%	14.2%	3.6%	0%		21.3%	4.1%	11.9%	1.8%	0%		17.9%	6.2%	29.1%	1.5%	0%		36.8%	0.8%	20.2%	2.9%	0%		24%	-
PHF	0.68	0.89	0.8	0		0.83	0.77	0.85	0.83	0		0.9	0.79	0.94	0.96	0		0.91	0.75	0.89	0.87	0		0.9	-
Heavy	0	8	0	0		8	0	7	0	0		7	0	7	5	0		12	5	8	0	0		13	-
Heavy %	0%	3.2%	0%	0%		2.1%	0%	3.3%	0%	0%		2.2%	0%	1.3%	18.5%	0%		1.8%	33.3%	2.2%	0%	0%		3%	-
Lights	63	245	64	0		372	74	205	33	0		312	110	513	22	0		645	10	353	52	0		415	-
Lights %	100%	96.8%	100%	0%		97.9%	100%	96.7%	100%	0%		97.8%	100%	98.7%	81.5%	0%		98.2%	66.7%	97.8%	100%	0%		97%	-
Single-Unit Trucks	0	6	0	0		6	0	4	0	0		4	0	4	5	0		9	4	5	0	0		9	-
Single-Unit Trucks %	0%	2.4%	0%	0%		1.6%	0%	1.9%	0%	0%		1.3%	0%	0.8%	18.5%	0%		1.4%	26.7%	1.4%	0%	0%		2.1%	-
Buses	0	0	0	0		0	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	-
Buses %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0.2%	0%	0%		0.2%	0%	0%	0%	0%		0%	-
Articulated Trucks	0	2	0	0		2	0	3	0	0		3	0	2	0	0		2	1	3	0	0		4	-
Articulated Trucks %	0%	0.8%	0%	0%		0.5%	0%	1.4%	0%	0%		0.9%	0%	0.4%	0%	0%		0.3%	6.7%	0.8%	0%	0%		0.9%	-
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	-
Bicycles on Road%	-	-	-	-	%		-	-	-	-	%		-	-	-	-	%		-	-	-	-	%		-

Peak Hour: 05:00 PM - 06:00 PM Weather:



Turning Movement Count (3 . FOX FARM ROAD & COUNTY ROAD 22)

Start Time	E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)					S Approach FOX FARM ROAD					W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)					Int. Total (15 min)	Int. Total (1 hr)
	Thru E:W	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	U-Turn W:W	Peds W:	Approach Total		
07:00:00	30	0	0	0	30	0	0	0	0	0	1	31	0	0	32	62	
07:15:00	38	0	0	0	38	3	0	0	0	3	0	45	0	0	45	86	
07:30:00	30	0	0	0	30	2	2	0	0	4	0	54	0	0	54	88	
07:45:00	42	1	0	0	43	3	2	0	0	5	0	60	0	0	60	108	344
08:00:00	53	1	0	0	54	1	3	0	0	4	0	58	0	0	58	116	398
08:15:00	42	0	0	0	42	8	0	0	0	8	1	68	0	0	69	119	431
08:30:00	45	0	0	0	45	2	2	0	0	4	1	57	0	0	58	107	450
08:45:00	37	2	0	0	39	0	0	0	0	0	0	56	0	0	56	95	437
09:00:00	46	0	0	0	46	3	0	0	0	3	0	58	0	0	58	107	428
09:15:00	45	1	0	0	46	1	1	0	0	2	0	59	0	0	59	107	416
09:30:00	60	4	0	0	64	1	0	0	0	1	1	47	0	0	48	113	422
09:45:00	69	2	0	0	71	3	2	0	0	5	1	52	0	0	53	129	456
10:00:00	51	1	0	0	52	0	0	0	0	0	1	85	0	0	86	138	487
10:15:00	52	2	0	0	54	0	1	0	0	1	1	60	0	0	61	116	496
10:30:00	58	0	0	0	58	5	0	0	0	5	0	65	0	0	65	128	511
10:45:00	67	0	0	0	67	1	2	0	0	3	1	59	0	0	60	130	512
11:00:00	69	0	0	0	69	1	0	0	0	1	0	64	0	0	64	134	508
11:15:00	73	1	0	0	74	0	0	0	0	0	0	63	0	0	63	137	529
11:30:00	64	4	0	0	68	1	1	0	0	2	3	61	0	0	64	134	535
11:45:00	66	1	0	0	67	2	3	0	0	5	2	61	0	0	63	135	540
BREAK																	
16:00:00	84	2	0	0	86	1	0	0	0	1	1	83	0	0	84	171	

16:15:00	76	1	0	0	77	1	3	0	0	4	4	85	0	0	89	170	
16:30:00	80	0	0	0	80	2	1	0	0	3	0	94	0	0	94	177	
16:45:00	93	1	0	0	94	0	0	0	0	0	4	105	0	0	109	203	721
17:00:00	86	3	0	0	89	2	1	0	0	3	2	90	0	0	92	184	734
17:15:00	76	0	0	0	76	1	0	0	0	1	1	103	0	0	104	181	745
17:30:00	88	4	0	0	92	0	0	0	0	0	1	100	0	0	101	193	761
17:45:00	53	3	0	0	56	2	0	0	0	2	3	64	0	0	67	125	683
18:00:00	58	0	0	0	58	0	0	0	0	0	0	57	0	0	57	115	614
18:15:00	57	1	0	0	58	0	0	0	0	0	2	72	0	0	74	132	565
18:30:00	50	2	0	0	52	0	0	0	0	0	0	57	0	0	57	109	481
18:45:00	32	1	0	0	33	2	0	0	0	2	1	46	0	0	47	82	438
Grand Total	1870	38	0	0	1908	48	24	0	0	72	32	2119	0	0	2151	**4131**	-
Approach%	98%	2%	0%		-	66.7%	33.3%	0%		-	1.5%	98.5%	0%		-	**-**	-
Totals %	45.3%	0.9%	0%		46.2%	1.2%	0.6%	0%		1.7%	0.8%	51.3%	0%		52.1%	**-**	-
Heavy	125	1	0		-	0	0	0		-	1	174	0		-	**-**	-
Heavy %	6.7%	2.6%	0%		-	0%	0%	0%		-	3.1%	8.2%	0%		-	**-**	-
Bicycles	0	0	0		-	0	0	0		-	0	1	0		-	**-**	-
Bicycle %	0%	0%	0%		-	0%	0%	0%		-	0%	0%	0%		-	**-**	-

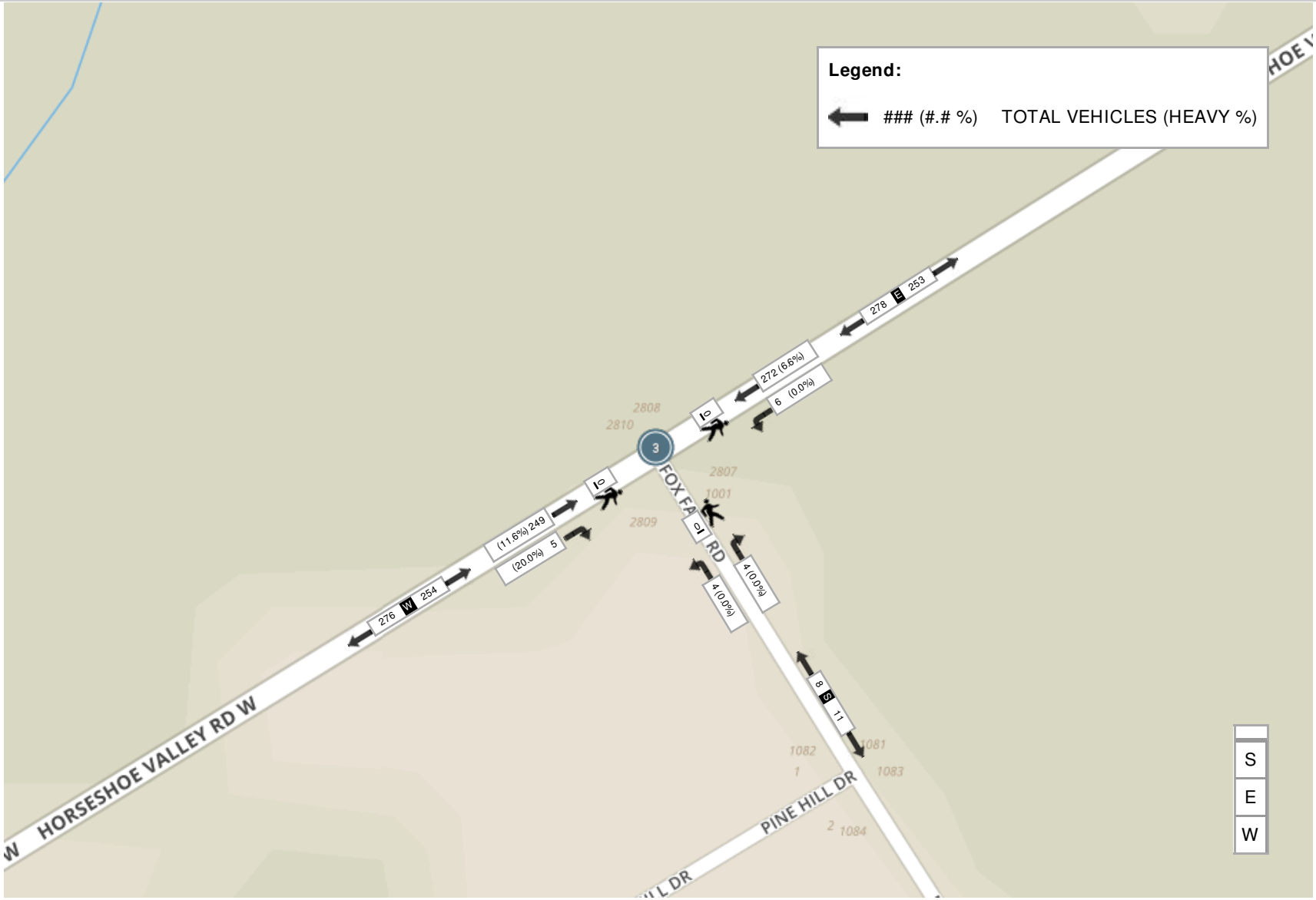
Peak Hour: 11:00 AM - 12:00 PM Weather:

Start Time	E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)					S Approach FOX FARM ROAD					W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)					Int. Total (15 min)
	Thru	Left	U-Turn	Peds	Approach Total	Right	Left	U-Turn	Peds	Approach Total	Right	Thru	U-Turn	Peds	Approach Total	
11:00:00	69	0	0	0	69	1	0	0	0	1	0	64	0	0	64	134
11:15:00	73	1	0	0	74	0	0	0	0	0	0	63	0	0	63	137
11:30:00	64	4	0	0	68	1	1	0	0	2	3	61	0	0	64	134
11:45:00	66	1	0	0	67	2	3	0	0	5	2	61	0	0	63	135
Grand Total	272	6	0	0	278	4	4	0	0	8	5	249	0	0	254	**540**
Approach%	97.8%	2.2%	0%		-	50%	50%	0%		-	2%	98%	0%		-	-
Totals %	50.4%	1.1%	0%		51.5%	0.7%	0.7%	0%		1.5%	0.9%	46.1%	0%		47%	-
PHF	0.93	0.38	0		0.94	0.5	0.33	0		0.4	0.42	0.97	0		0.99	-
Heavy	18	0	0		18	0	0	0		0	1	29	0		30	-
Heavy %	6.6%	0%	0%		6.5%	0%	0%	0%		0%	20%	11.6%	0%		11.8%	-
Lights	254	6	0		260	4	4	0		8	4	220	0		224	-
Lights %	93.4%	100%	0%		93.5%	100%	100%	0%		100%	80%	88.4%	0%		88.2%	-
Single-Unit Trucks	6	0	0		6	0	0	0		0	1	15	0		16	-
Single-Unit Trucks %	2.2%	0%	0%		2.2%	0%	0%	0%		0%	20%	6%	0%		6.3%	-
Buses	6	0	0		6	0	0	0		0	0	0	0		0	-
Buses %	2.2%	0%	0%		2.2%	0%	0%	0%		0%	0%	0%	0%		0%	-
Articulated Trucks	6	0	0		6	0	0	0		0	0	14	0		14	-
Articulated Trucks %	2.2%	0%	0%		2.2%	0%	0%	0%		0%	0%	5.6%	0%		5.5%	-
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	-
Bicycles on Road%	-	-	-	%		-	-	-	%		-	-	-	%		-

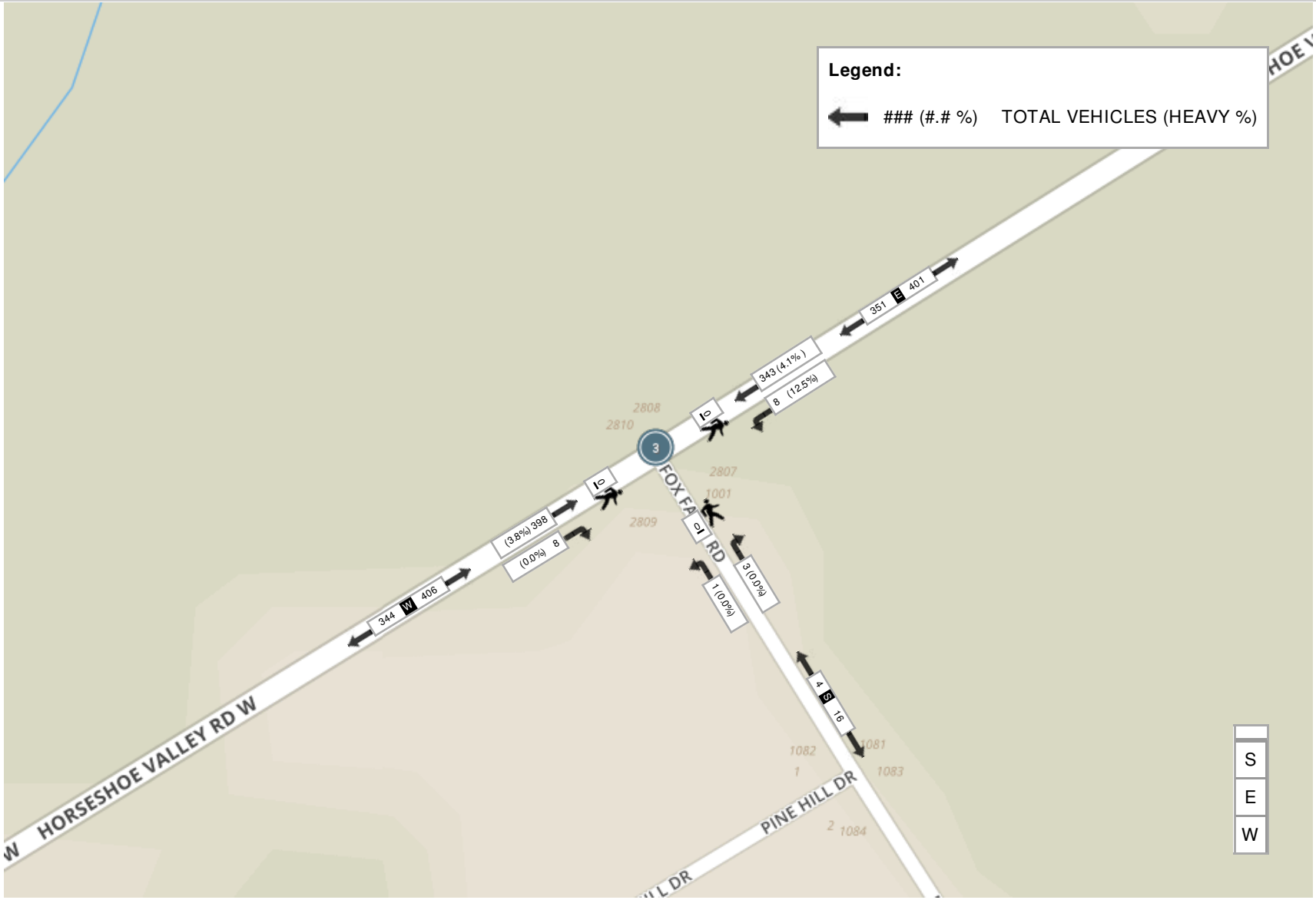
Peak Hour: 04:45 PM - 05:45 PM Weather:

Start Time	E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)					S Approach FOX FARM ROAD					W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)					Int. Total (15 min)
	Thru	Left	U-Turn	Peds	Approach Total	Right	Left	U-Turn	Peds	Approach Total	Right	Thru	U-Turn	Peds	Approach Total	
16:45:00	93	1	0	0	94	0	0	0	0	0	4	105	0	0	109	203
17:00:00	86	3	0	0	89	2	1	0	0	3	2	90	0	0	92	184
17:15:00	76	0	0	0	76	1	0	0	0	1	1	103	0	0	104	181
17:30:00	88	4	0	0	92	0	0	0	0	0	1	100	0	0	101	193
Grand Total	343	8	0	0	351	3	1	0	0	4	8	398	0	0	406	**761**
Approach%	97.7%	2.3%	0%		-	75%	25%	0%		-	2%	98%	0%		-	-
Totals %	45.1%	1.1%	0%		46.1%	0.4%	0.1%	0%		0.5%	1.1%	52.3%	0%		53.4%	-
PHF	0.92	0.5	0		0.93	0.38	0.25	0		0.33	0.5	0.95	0		0.93	-
Heavy	14	1	0		15	0	0	0		0	0	15	0		15	-
Heavy %	4.1%	12.5%	0%		4.3%	0%	0%	0%		0%	0%	3.8%	0%		3.7%	-
Lights	329	7	0		336	3	1	0		4	8	383	0		391	-
Lights %	95.9%	87.5%	0%		95.7%	100%	100%	0%		100%	100%	96.2%	0%		96.3%	-
Single-Unit Trucks	5	1	0		6	0	0	0		0	0	12	0		12	-
Single-Unit Trucks %	1.5%	12.5%	0%		1.7%	0%	0%	0%		0%	0%	3%	0%		3%	-
Buses	0	0	0		0	0	0	0		0	0	0	0		0	-
Buses %	0%	0%	0%		0%	0%	0%	0%		0%	0%	0%	0%		0%	-
Articulated Trucks	9	0	0		9	0	0	0		0	0	3	0		3	-
Articulated Trucks %	2.6%	0%	0%		2.6%	0%	0%	0%		0%	0%	0.8%	0%		0.7%	-
Bicycles on Road	0	0	0	0	-	0	0	0	0	-	0	0	0	0	-	-
Bicycles on Road%	-	-	-	%		-	-	-	%		-	-	-	%		-

Peak Hour: 11:00 AM - 12:00 PM Weather:



Peak Hour: 04:45 PM - 05:45 PM Weather:



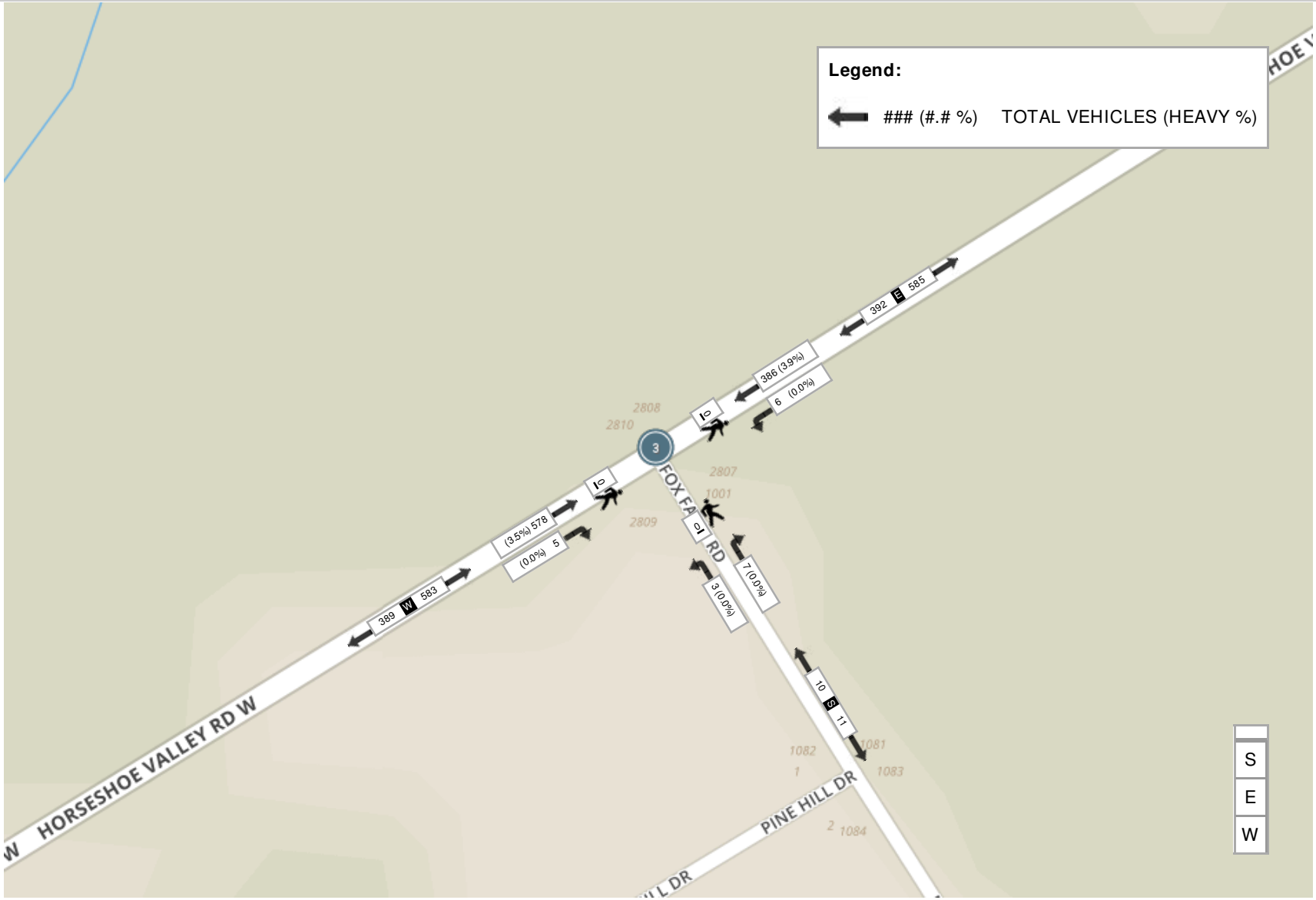
Turning Movement Count (3 . FOX FARM ROAD & COUNTY ROAD 22)

Start Time	E Approach FOX FARMCOUNTY ROAD 22 (HORSESHOE VALLEY RD W)					S Approach FOX FARM ROAD					W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)					Int. Total (15 min)	Int. Total (1 hr)
	Thru E:W	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	U-Turn W:W	Peds W:	Approach Total		
16:00:00	106	0	0	0	106	1	2	0	0	3	1	138	0	0	139	248	
16:15:00	83	3	0	0	86	3	1	0	0	4	0	152	0	0	152	242	
16:30:00	88	3	0	0	91	2	0	0	0	2	3	146	0	0	149	242	
16:45:00	109	0	0	0	109	1	0	0	0	1	1	142	0	0	143	253	985
17:00:00	68	4	0	0	72	3	0	0	0	3	5	140	0	0	145	220	957
17:15:00	87	1	0	0	88	1	1	0	0	2	0	145	0	0	145	235	950
17:30:00	82	2	0	0	84	1	2	0	0	3	0	111	0	0	111	198	906
17:45:00	85	4	0	0	89	1	2	0	0	3	2	143	0	0	145	237	890
18:00:00	56	1	0	0	57	0	1	0	0	1	2	131	0	0	133	191	861
18:15:00	71	1	0	0	72	2	0	0	0	2	3	117	0	0	120	194	820
18:30:00	60	1	0	0	61	1	0	0	0	1	1	122	0	0	123	185	807
18:45:00	61	0	0	0	61	0	2	0	0	2	0	100	0	0	100	163	733
Grand Total	956	20	0	0	976	16	11	0	0	27	18	1587	0	0	1605	**2608**	-
Approach%	98%	2%	0%		-	59.3%	40.7%	0%		-	1.1%	98.9%	0%		-	**-**	-
Totals %	36.7%	0.8%	0%		37.4%	0.6%	0.4%	0%		1%	0.7%	60.9%	0%		61.5%	**-**	-
Heavy	28	0	0		-	0	0	0		-	0	48	0		-	**-**	-
Heavy %	2.9%	0%	0%		-	0%	0%	0%		-	0%	3%	0%		-	**-**	-
Bicycles	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-
Bicycle %	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-

Peak Hour: 04:00 PM - 05:00 PM Weather:

Start Time	E Approach FOX FARMCOUNTY ROAD 22 (HORSESHOE VALLEY RD W)					S Approach FOX FARM ROAD					W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)					Int. Total (15 min)
	Thru	Left	U-Turn	Peds	Approach Total	Right	Left	U-Turn	Peds	Approach Total	Right	Thru	U-Turn	Peds	Approach Total	
16:00:00	106	0	0	0	106	1	2	0	0	3	1	138	0	0	139	248
16:15:00	83	3	0	0	86	3	1	0	0	4	0	152	0	0	152	242
16:30:00	88	3	0	0	91	2	0	0	0	2	3	146	0	0	149	242
16:45:00	109	0	0	0	109	1	0	0	0	1	1	142	0	0	143	253
Grand Total	386	6	0	0	392	7	3	0	0	10	5	578	0	0	583	**985**
Approach%	98.5%	1.5%	0%		-	70%	30%	0%		-	0.9%	99.1%	0%		-	-
Totals %	39.2%	0.6%	0%		39.8%	0.7%	0.3%	0%		1%	0.5%	58.7%	0%		59.2%	-
PHF	0.89	0.5	0		0.9	0.58	0.38	0		0.63	0.42	0.95	0		0.96	-
Heavy	15	0	0		15	0	0	0		0	0	20	0		20	-
Heavy %	3.9%	0%	0%		3.8%	0%	0%	0%		0%	0%	3.5%	0%		3.4%	-
Lights	371	6	0		377	7	3	0		10	5	558	0		563	-
Lights %	96.1%	100%	0%		96.2%	100%	100%	0%		100%	100%	96.5%	0%		96.6%	-
Single-Unit Trucks	13	0	0		13	0	0	0		0	0	11	0		11	-
Single-Unit Trucks %	3.4%	0%	0%		3.3%	0%	0%	0%		0%	0%	1.9%	0%		1.9%	-
Buses	1	0	0		1	0	0	0		0	0	0	0		0	-
Buses %	0.3%	0%	0%		0.3%	0%	0%	0%		0%	0%	0%	0%		0%	-
Articulated Trucks	1	0	0		1	0	0	0		0	0	9	0		9	-
Articulated Trucks %	0.3%	0%	0%		0.3%	0%	0%	0%		0%	0%	1.6%	0%		1.5%	-

Peak Hour: 04:00 PM - 05:00 PM Weather:



Turning Movement Count (2 . GILL ROAD & COUNTY ROAD 22 (HORSESHOE VALLEY RD W))

Start Time	N Approach GILL ROAD						E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						S Approach GILL ROAD						W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	U-Turn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	U-Turn W:W	Peds W:	Approach Total		
07:00:00	0	0	0	0	0	0	0	30	1	0	0	31	1	0	3	0	0	4	0	35	0	0	0	35	70	
07:15:00	0	1	0	0	0	1	0	38	0	0	0	38	2	0	2	0	0	4	1	41	1	0	0	43	86	
07:30:00	0	0	0	0	0	0	0	31	0	0	0	31	3	0	4	0	0	7	5	49	0	1	0	55	93	
07:45:00	0	0	0	0	0	0	0	42	3	0	0	45	5	1	4	0	0	10	3	55	0	0	0	58	113	362
08:00:00	0	0	1	0	0	1	0	48	6	0	0	54	6	0	0	0	0	6	1	62	2	0	0	65	126	418
08:15:00	1	0	1	0	0	2	0	40	4	0	0	44	4	2	3	0	0	9	1	53	2	0	0	56	111	443
08:30:00	1	0	0	0	0	1	1	43	0	0	0	44	6	0	2	0	0	8	3	46	1	0	0	50	103	453
08:45:00	0	0	0	0	0	0	1	33	2	0	0	36	2	0	3	0	0	5	1	56	6	0	0	63	104	444
09:00:00	1	0	1	0	0	2	2	44	2	0	0	48	2	0	1	0	0	3	3	57	1	0	0	61	114	432
09:15:00	2	0	2	0	0	4	2	45	0	0	0	47	1	0	1	0	0	2	0	55	0	0	0	55	108	429
09:30:00	3	0	2	0	0	5	3	56	0	0	0	59	0	0	4	0	0	4	4	44	0	0	0	48	116	442
09:45:00	2	0	2	0	0	4	2	67	3	0	0	72	2	1	3	0	0	6	0	48	0	0	0	48	130	468
10:00:00	1	0	4	0	0	5	1	51	1	0	0	53	2	0	0	0	0	2	1	78	2	0	0	81	141	495
10:15:00	0	0	2	0	0	2	2	48	0	0	0	50	1	0	1	0	0	2	4	58	1	0	0	63	117	504
10:30:00	0	0	2	0	0	2	0	54	3	0	0	57	5	0	1	0	0	6	1	62	6	0	0	69	134	522
10:45:00	0	1	2	0	0	3	3	62	1	0	0	66	2	1	3	0	0	6	3	64	3	0	0	70	145	537
11:00:00	2	0	1	0	0	3	2	69	3	0	0	74	1	0	0	0	0	1	3	58	1	0	0	62	140	536
11:15:00	1	1	4	0	0	6	8	63	3	0	0	74	2	0	2	0	0	4	1	51	1	0	0	53	137	556
11:30:00	0	1	6	0	0	7	3	65	4	0	0	72	2	1	2	0	0	5	1	64	5	0	0	70	154	576
11:45:00	6	0	2	0	0	8	3	62	2	0	0	67	5	0	3	0	0	8	3	54	1	0	0	58	141	572
BREAK																										
16:00:00	11	1	4	0	0	16	4	77	5	0	0	86	7	0	3	0	0	10	4	73	6	0	0	83	195	
16:15:00	3	0	1	0	0	4	4	70	6	0	0	80	7	0	2	0	0	9	2	77	6	0	0	85	178	
16:30:00	7	5	10	0	0	22	3	70	3	0	0	76	1	2	5	0	0	8	2	92	5	0	0	99	205	
16:45:00	2	0	5	0	0	7	3	80	5	0	0	88	1	1	1	0	0	3	6	108	3	0	0	117	215	793
17:00:00	3	0	3	0	0	6	1	88	4	0	0	93	2	1	2	0	0	5	4	85	3	0	0	92	196	794
17:15:00	3	0	2	0	0	5	3	70	2	0	0	75	3	0	3	0	0	6	5	95	4	0	0	104	190	806
17:30:00	4	0	5	0	0	9	3	86	3	0	0	92	3	1	5	0	0	9	3	89	3	0	0	95	205	806
17:45:00	1	1	2	0	0	4	0	50	2	0	0	52	1	0	3	0	0	4	7	63	0	0	0	70	130	721
18:00:00	3	0	0	0	0	3	1	51	3	0	0	55	4	0	3	0	0	7	3	55	1	0	0	59	124	649
18:15:00	0	0	0	0	0	0	0	55	4	0	0	59	1	0	2	0	0	3	0	73	0	0	0	73	135	594

18:30:00	0	0	1	0	0	1	1	48	2	0	0	51	0	0	0	0	0	0	2	55	0	0	0	57	109	498
18:45:00	1	0	0	0	0	1	1	30	0	0	0	31	1	0	0	0	0	1	1	44	0	0	0	45	78	446
Grand Total	58	11	65	0	0	134	57	1766	77	0	0	1900	85	11	71	0	0	167	78	1999	64	1	0	2142	**4343**	-
Approach%	43.3%	8.2%	48.5%	0%		-	3%	92.9%	4.1%	0%		-	50.9%	6.6%	42.5%	0%		-	3.6%	93.3%	3%	0%		-	**-**	-
Totals %	1.3%	0.3%	1.5%	0%		3.1%	1.3%	40.7%	1.8%	0%		43.7%	2%	0.3%	1.6%	0%		3.8%	1.8%	46%	1.5%	0%		49.3%	**-**	-
Heavy	2	0	1	0		-	1	121	6	0		-	3	0	12	0		-	10	179	1	0		-	**-**	-
Heavy %	3.4%	0%	1.5%	0%		-	1.8%	6.9%	7.8%	0%		-	3.5%	0%	16.9%	0%		-	12.8%	9%	1.6%	0%		-	**-**	-
Bicycles	0	0	0	0		-	0	0	0	0		-	1	0	0	0		-	0	0	0	0		-	**-**	-
Bicycle %	0%	0%	0%	0%		-	0%	0%	0%	0%		-	1.2%	0%	0%	0%		-	0%	0%	0%	0%		-	**-**	-

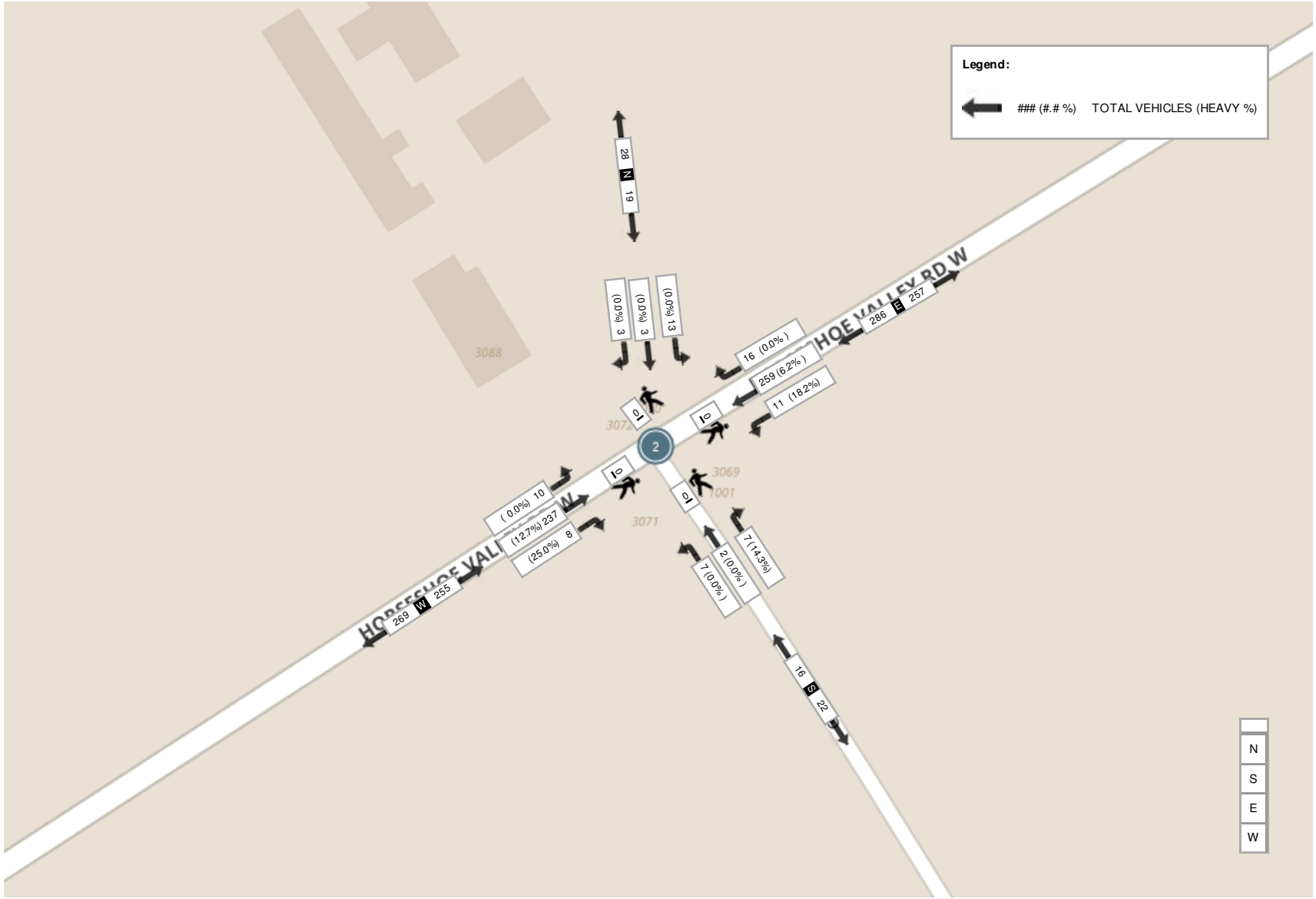
Peak Hour: 10:45 AM - 11:45 AM Weather:

Start Time	N Approach GILL ROAD						E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						S Approach GILL ROAD						W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
10:45:00	0	1	2	0	0	3	3	62	1	0	0	66	2	1	3	0	0	6	3	64	3	0	0	70	145
11:00:00	2	0	1	0	0	3	2	69	3	0	0	74	1	0	0	0	0	1	3	58	1	0	0	62	140
11:15:00	1	1	4	0	0	6	8	63	3	0	0	74	2	0	2	0	0	4	1	51	1	0	0	53	137
11:30:00	0	1	6	0	0	7	3	65	4	0	0	72	2	1	2	0	0	5	1	64	5	0	0	70	154
Grand Total	3	3	13	0	0	19	16	259	11	0	0	286	7	2	7	0	0	16	8	237	10	0	0	255	**576**
Approach%	15.8%	15.8%	68.4%	0%		-	5.6%	90.6%	3.8%	0%		-	43.8%	12.5%	43.8%	0%		-	3.1%	92.9%	3.9%	0%		-	**-**
Totals %	0.5%	0.5%	2.3%	0%		3.3%	2.8%	45%	1.9%	0%		49.7%	1.2%	0.3%	1.2%	0%		2.8%	1.4%	41.1%	1.7%	0%		44.3%	**-**
PHF	0.38	0.75	0.54	0		0.68	0.5	0.94	0.69	0		0.97	0.88	0.5	0.58	0		0.67	0.67	0.93	0.5	0		0.91	**-**
Heavy	0	0	0	0		0	0	16	2	0		18	1	0	0	0		1	2	30	0	0		32	**-**
Heavy %	0%	0%	0%	0%		0%	0%	6.2%	18.2%	0%		6.3%	14.3%	0%	0%	0%		6.3%	25%	12.7%	0%	0%		12.5%	**-**
Lights	3	3	13	0		19	16	243	9	0		268	6	2	7	0		15	6	207	10	0		223	**-**
Lights %	100%	100%	100%	0%		100%	100%	93.8%	81.8%	0%		93.7%	85.7%	100%	100%	0%		93.8%	75%	87.3%	100%	0%		87.5%	**-**
Single-Unit Trucks	0	0	0	0		0	0	9	1	0		10	1	0	0	0		1	2	18	0	0		20	**-**
Single-Unit Trucks %	0%	0%	0%	0%		0%	0%	3.5%	9.1%	0%		3.5%	14.3%	0%	0%	0%		6.3%	25%	7.6%	0%	0%		7.8%	**-**
Buses	0	0	0	0		0	0	0	1	0		1	0	0	0	0		0	0	0	0	0		0	**-**
Buses %	0%	0%	0%	0%		0%	0%	0%	9.1%	0%		0.3%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Articulated Trucks	0	0	0	0		0	0	7	0	0		7	0	0	0	0		0	0	12	0	0		12	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	0%	2.7%	0%	0%		2.4%	0%	0%	0%	0%		0%	0%	5.1%	0%	0%		4.7%	**-**
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	-	%		-	-	-	-	%		-	-	-	-	%		-	-	-	-	%		**-**

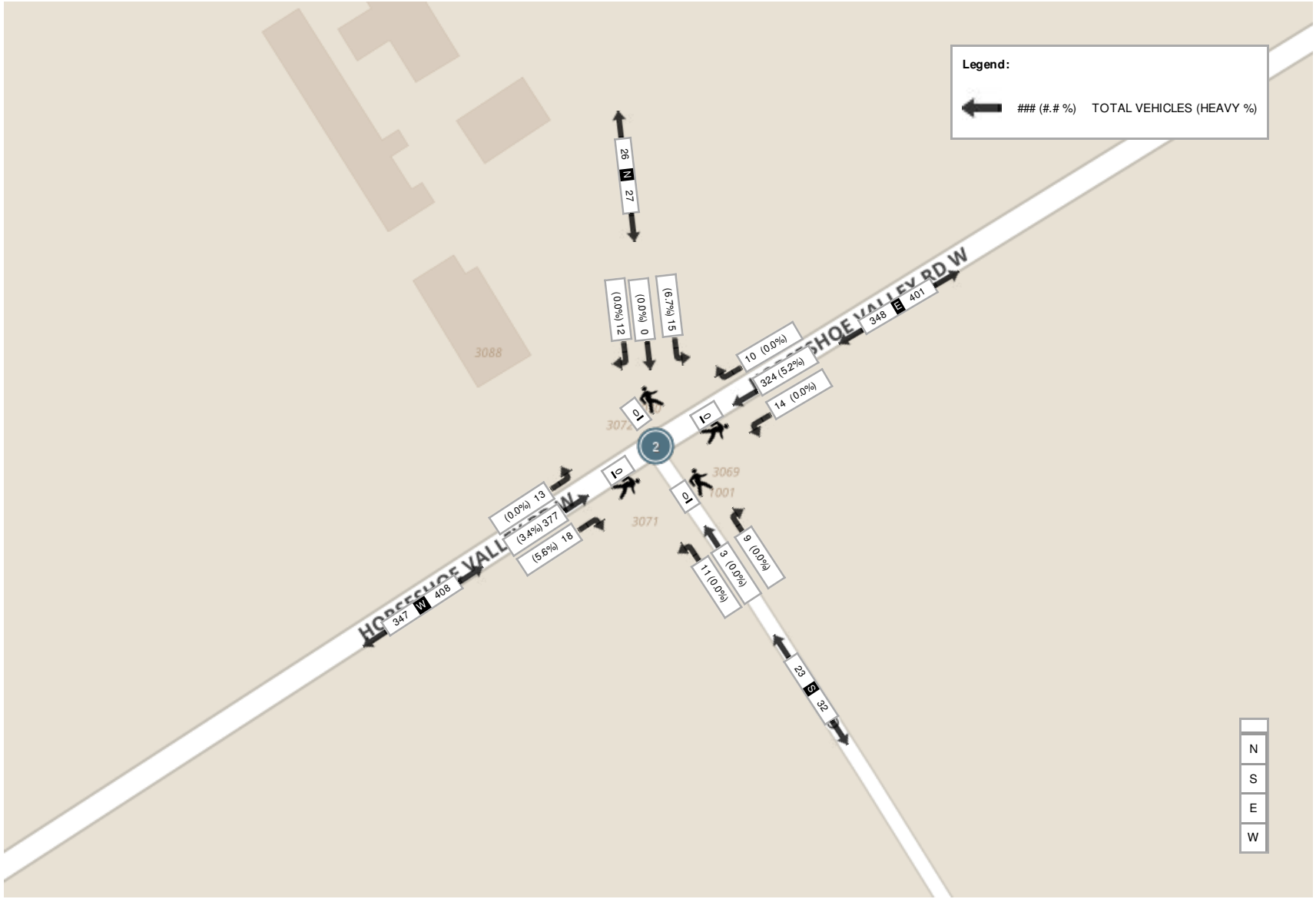
Peak Hour: 04:45 PM - 05:45 PM Weather:

Start Time	N Approach GILL ROAD						E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						S Approach GILL ROAD						W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
16:45:00	2	0	5	0	0	7	3	80	5	0	0	88	1	1	1	0	0	3	6	108	3	0	0	117	215
17:00:00	3	0	3	0	0	6	1	88	4	0	0	93	2	1	2	0	0	5	4	85	3	0	0	92	196
17:15:00	3	0	2	0	0	5	3	70	2	0	0	75	3	0	3	0	0	6	5	95	4	0	0	104	190
17:30:00	4	0	5	0	0	9	3	86	3	0	0	92	3	1	5	0	0	9	3	89	3	0	0	95	205
Grand Total	12	0	15	0	0	27	10	324	14	0	0	348	9	3	11	0	0	23	18	377	13	0	0	408	**806**
Approach%	44.4%	0%	55.6%	0%		-	2.9%	93.1%	4%	0%		-	39.1%	13%	47.8%	0%		-	4.4%	92.4%	3.2%	0%		-	**-**
Totals %	1.5%	0%	1.9%	0%		3.3%	1.2%	40.2%	1.7%	0%		43.2%	1.1%	0.4%	1.4%	0%		2.9%	2.2%	46.8%	1.6%	0%		50.6%	**-**
PHF	0.75	0	0.75	0		0.75	0.83	0.92	0.7	0		0.94	0.75	0.75	0.55	0		0.64	0.75	0.87	0.81	0		0.87	**-**
Heavy	0	0	1	0		1	0	17	0	0		17	0	0	0	0		0	1	13	0	0		14	**-**
Heavy %	0%	0%	6.7%	0%		3.7%	0%	5.2%	0%	0%		4.9%	0%	0%	0%	0%		0%	5.6%	3.4%	0%	0%		3.4%	**-**
Lights	12	0	14	0		26	10	307	14	0		331	9	3	11	0		23	17	364	13	0		394	**-**
Lights %	100%	0%	93.3%	0%		96.3%	100%	94.8%	100%	0%		95.1%	100%	100%	100%	0%		100%	94.4%	96.6%	100%	0%		96.6%	**-**
Single-Unit Trucks	0	0	1	0		1	0	10	0	0		10	0	0	0	0		0	1	8	0	0		9	**-**
Single-Unit Trucks %	0%	0%	6.7%	0%		3.7%	0%	3.1%	0%	0%		2.9%	0%	0%	0%	0%		0%	5.6%	2.1%	0%	0%		2.2%	**-**
Buses	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	**-**
Buses %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Articulated Trucks	0	0	0	0		0	0	7	0	0		7	0	0	0	0		0	0	5	0	0		5	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	0%	2.2%	0%	0%		2%	0%	0%	0%	0%		0%	0%	1.3%	0%	0%		1.2%	**-**
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	-	%		-	-	-	-	%		-	-	-	-	%		-	-	-	-	%		**-**

Peak Hour: 10:45 AM - 11:45 AM Weather:



Peak Hour: 04:45 PM - 05:45 PM Weather:



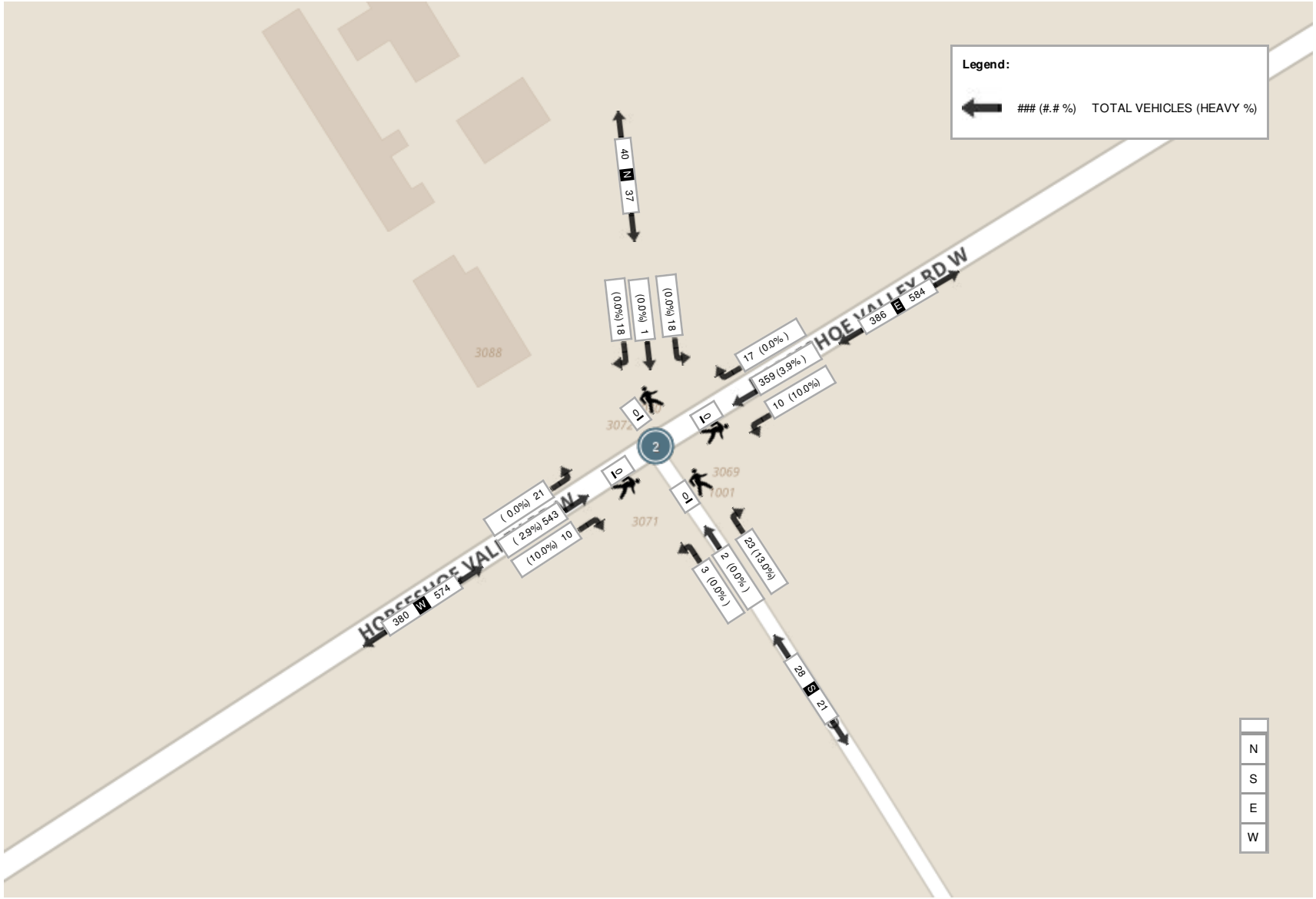
Turning Movement Count (2 . GILL ROAD & COUNTY ROAD 22 (HORSESHOE VALLEY RD W))

Start Time	N Approach GILL ROAD						E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						S Approach GILL ROAD						W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	U-Turn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	U-Turn W:W	Peds W:	Approach Total		
16:00:00	5	0	8	0	0	13	2	102	3	0	0	107	2	0	2	0	0	4	1	131	5	0	0	137	261	
16:15:00	6	0	4	0	0	10	4	80	3	0	0	87	6	1	0	0	0	7	4	137	4	0	0	145	249	
16:30:00	2	1	5	0	0	8	6	78	2	0	0	86	9	0	0	0	0	9	2	142	6	0	0	150	253	
16:45:00	5	0	1	0	0	6	5	99	2	0	0	106	6	1	1	0	0	8	3	133	6	0	0	142	262	1025
17:00:00	4	1	8	0	0	13	3	68	3	0	0	74	3	0	1	0	0	4	2	127	7	0	0	136	227	991
17:15:00	2	0	5	0	0	7	5	74	8	0	0	87	4	1	3	0	0	8	1	138	0	0	0	139	241	983
17:30:00	2	1	5	0	0	8	3	78	4	0	0	85	4	0	2	0	0	6	4	109	5	0	0	118	217	947
17:45:00	6	0	7	0	0	13	1	81	2	0	0	84	4	0	1	0	0	5	5	131	8	0	0	144	246	931
18:00:00	1	1	4	0	0	6	0	56	1	0	0	57	2	1	3	0	0	6	2	130	1	0	0	133	202	906
18:15:00	0	1	0	0	0	1	0	70	2	0	0	72	3	1	2	0	0	6	4	119	0	0	0	123	202	867
18:30:00	0	0	0	0	0	0	1	57	2	0	0	60	1	0	1	0	0	2	4	103	0	0	0	107	169	819
18:45:00	0	0	0	0	0	0	0	59	4	0	0	63	3	0	2	0	0	5	1	104	0	0	0	105	173	746
Grand Total	33	5	47	0	0	85	30	902	36	0	0	968	47	5	18	0	0	70	33	1504	42	0	0	1579	**2702**	-
Approach%	38.8%	5.9%	55.3%	0%		-	3.1%	93.2%	3.7%	0%		-	67.1%	7.1%	25.7%	0%		-	2.1%	95.3%	2.7%	0%		-	**-**	-
Totals %	1.2%	0.2%	1.7%	0%		3.1%	1.1%	33.4%	1.3%	0%		35.8%	1.7%	0.2%	0.7%	0%		2.6%	1.2%	55.7%	1.6%	0%		58.4%	**-**	-
Heavy	0	0	1	0		-	0	28	1	0		-	3	0	0	0		-	1	44	1	0		-	**-**	-
Heavy %	0%	0%	2.1%	0%		-	0%	3.1%	2.8%	0%		-	6.4%	0%	0%	0%		-	3%	2.9%	2.4%	0%		-	**-**	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-

Peak Hour: 04:00 PM - 05:00 PM Weather:

Start Time	N Approach GILL ROAD						E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						S Approach GILL ROAD						W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
16:00:00	5	0	8	0	0	13	2	102	3	0	0	107	2	0	2	0	0	4	1	131	5	0	0	137	261
16:15:00	6	0	4	0	0	10	4	80	3	0	0	87	6	1	0	0	0	7	4	137	4	0	0	145	249
16:30:00	2	1	5	0	0	8	6	78	2	0	0	86	9	0	0	0	0	9	2	142	6	0	0	150	253
16:45:00	5	0	1	0	0	6	5	99	2	0	0	106	6	1	1	0	0	8	3	133	6	0	0	142	262
Grand Total	18	1	18	0	0	37	17	359	10	0	0	386	23	2	3	0	0	28	10	543	21	0	0	574	**1025**
Approach%	48.6%	2.7%	48.6%	0%		-	4.4%	93%	2.6%	0%		-	82.1%	7.1%	10.7%	0%		-	1.7%	94.6%	3.7%	0%		-	-
Totals %	1.8%	0.1%	1.8%	0%		3.6%	1.7%	35%	1%	0%		37.7%	2.2%	0.2%	0.3%	0%		2.7%	1%	53%	2%	0%		56%	-
PHF	0.75	0.25	0.56	0		0.71	0.71	0.88	0.83	0		0.9	0.64	0.5	0.38	0		0.78	0.63	0.96	0.88	0		0.96	-
Heavy	0	0	0	0		0	0	14	1	0		15	3	0	0	0		3	1	16	0	0		17	-
Heavy %	0%	0%	0%	0%		0%	0%	3.9%	10%	0%		3.9%	13%	0%	0%	0%		10.7%	10%	2.9%	0%	0%		3%	-
Lights	18	1	18	0		37	17	345	9	0		371	20	2	3	0		25	9	527	21	0		557	-
Lights %	100%	100%	100%	0%		100%	100%	96.1%	90%	0%		96.1%	87%	100%	100%	0%		89.3%	90%	97.1%	100%	0%		97%	-
Single-Unit Trucks	0	0	0	0		0	0	12	1	0		13	3	0	0	0		3	0	6	0	0		6	-
Single-Unit Trucks %	0%	0%	0%	0%		0%	0%	3.3%	10%	0%		3.4%	13%	0%	0%	0%		10.7%	0%	1.1%	0%	0%		1%	-
Buses	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	0	1	0	0		1	-
Buses %	0%	0%	0%	0%		0%	0%	0.3%	0%	0%		0.3%	0%	0%	0%	0%		0%	0%	0.2%	0%	0%		0.2%	-
Articulated Trucks	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	1	9	0	0		10	-
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0.3%	0%	0%		0.3%	0%	0%	0%	0%		0%	10%	1.7%	0%	0%		1.7%	-

Peak Hour: 04:00 PM - 05:00 PM Weather:



Turning Movement Count (4 . OLD SECOND ROAD & COUNTY ROAD 22)

Start Time	N Approach OLD SECOND ROAD						E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						S Approach OLD SECOND ROAD						W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	U-Turn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	U-Turn W:W	Peds W:	Approach Total		
07:00:00	0	3	1	0	0	4	1	32	0	0	0	33	1	0	1	0	0	2	4	29	0	0	0	33	72	
07:15:00	0	7	5	0	0	12	0	36	0	0	0	36	1	1	1	0	0	3	2	45	1	0	0	48	99	
07:30:00	1	6	8	0	0	15	3	30	0	0	0	33	0	0	0	0	0	0	2	54	1	0	0	57	105	
07:45:00	3	6	10	0	0	19	2	44	2	0	0	48	1	1	1	0	1	3	2	60	1	0	0	63	133	409
08:00:00	0	2	7	0	0	9	2	48	1	0	0	51	0	0	2	0	0	2	3	63	0	0	0	66	128	465
08:15:00	0	5	4	0	0	9	1	41	0	0	0	42	1	1	2	0	0	4	1	68	0	0	0	69	124	490
08:30:00	0	3	3	0	0	6	4	39	1	0	0	44	0	0	0	0	0	0	0	59	1	0	0	60	110	495
08:45:00	2	1	7	0	0	10	3	41	2	0	0	46	1	1	0	1	0	3	0	55	2	0	0	57	116	478
09:00:00	2	1	3	0	0	6	0	38	1	0	0	39	2	0	4	0	0	6	4	56	0	0	0	60	111	461
09:15:00	0	2	7	0	0	9	1	46	0	0	0	47	0	2	4	0	0	6	0	56	2	0	0	58	120	457
09:30:00	1	2	8	0	0	11	1	55	0	0	0	56	1	1	0	0	0	2	2	48	1	0	0	51	120	467
09:45:00	1	1	4	0	0	6	5	57	1	0	0	63	2	2	0	0	0	4	1	52	0	0	0	53	126	477
10:00:00	2	2	5	0	0	9	2	52	2	0	0	56	2	1	0	0	0	3	1	82	1	0	0	84	152	518
10:15:00	0	0	1	0	0	1	3	54	2	0	0	59	0	0	0	0	0	0	2	53	1	0	0	56	116	514
10:30:00	3	5	5	0	0	13	1	56	4	0	0	61	1	0	1	0	0	2	1	73	0	0	0	74	150	544
10:45:00	1	3	4	0	0	8	1	65	3	0	0	69	1	3	2	0	0	6	1	53	3	0	0	57	140	558
11:00:00	1	2	2	0	0	5	3	65	1	0	0	69	3	1	2	0	0	6	0	69	0	0	0	69	149	555
11:15:00	0	0	2	0	0	2	7	78	1	0	0	86	2	1	0	0	0	3	3	52	3	0	0	58	149	588
11:30:00	2	0	1	0	0	3	4	62	2	0	0	68	3	2	1	0	0	6	3	65	0	0	0	68	145	583
11:45:00	0	3	2	0	0	5	0	71	1	0	0	72	0	4	3	0	0	7	1	61	0	0	0	62	146	589
BREAK																										
16:00:00	0	1	5	0	0	6	7	87	2	0	0	96	5	2	4	0	0	11	3	75	2	0	0	80	193	
16:15:00	1	2	3	0	0	6	9	72	0	0	0	81	2	4	3	0	0	9	2	83	2	0	0	87	183	
16:30:00	1	4	3	0	0	8	7	78	1	0	0	86	1	5	2	0	0	8	1	96	1	0	0	98	200	
16:45:00	2	1	3	0	0	6	17	90	1	0	0	108	3	6	2	0	0	11	3	100	4	0	0	107	232	808
17:00:00	0	0	1	0	0	1	14	81	2	0	0	97	5	1	5	0	0	11	1	89	2	0	0	92	201	816
17:15:00	1	4	4	0	0	9	5	75	2	0	0	82	2	13	4	0	0	19	4	97	2	0	0	103	213	846
17:30:00	2	4	2	0	0	8	12	83	1	0	0	96	1	4	3	1	0	9	4	86	5	0	0	95	208	854
17:45:00	1	1	2	0	0	4	10	46	2	0	0	58	1	3	4	0	0	8	0	67	1	0	0	68	138	760
18:00:00	1	0	0	0	0	1	6	55	1	0	0	62	6	5	3	0	0	14	1	56	0	0	0	57	134	693
18:15:00	2	2	6	0	0	10	5	57	3	0	0	65	1	2	2	0	0	5	3	70	1	0	0	74	154	634

18:30:00	2	0	8	0	0	10	2	47	1	0	0	50	0	4	3	0	0	7	8	48	0	0	0	56	123	549
18:45:00	0	1	0	0	0	1	1	29	2	0	0	32	1	1	3	0	0	5	3	45	2	0	0	50	88	499
Grand Total	32	74	126	0	0	232	139	1810	42	0	0	1991	50	71	62	2	1	185	66	2065	39	0	0	2170	**4578**	-
Approach%	13.8%	31.9%	54.3%	0%		-	7%	90.9%	2.1%	0%		-	27%	38.4%	33.5%	1.1%		-	3%	95.2%	1.8%	0%		-	**-**	-
Totals %	0.7%	1.6%	2.8%	0%		5.1%	3%	39.5%	0.9%	0%		43.5%	1.1%	1.6%	1.4%	0%		4%	1.4%	45.1%	0.9%	0%		47.4%	**-**	-
Heavy	0	4	2	0		-	3	111	1	0		-	1	3	17	0		-	13	173	0	0		-	**-**	-
Heavy %	0%	5.4%	1.6%	0%		-	2.2%	6.1%	2.4%	0%		-	2%	4.2%	27.4%	0%		-	19.7%	8.4%	0%	0%		-	**-**	-
Bicycles	0	3	0	0		-	0	0	0	0		-	2	5	0	0		-	1	0	0	0		-	**-**	-
Bicycle %	0%	4.1%	0%	0%		-	0%	0%	0%	0%		-	4%	7%	0%	0%		-	1.5%	0%	0%	0%		-	**-**	-

Peak Hour: 11:00 AM - 12:00 PM Weather:

Start Time	N Approach OLD SECOND ROAD						E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						S Approach OLD SECOND ROAD						W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
11:00:00	1	2	2	0	0	5	3	65	1	0	0	69	3	1	2	0	0	6	0	69	0	0	0	69	149
11:15:00	0	0	2	0	0	2	7	78	1	0	0	86	2	1	0	0	0	3	3	52	3	0	0	58	149
11:30:00	2	0	1	0	0	3	4	62	2	0	0	68	3	2	1	0	0	6	3	65	0	0	0	68	145
11:45:00	0	3	2	0	0	5	0	71	1	0	0	72	0	4	3	0	0	7	1	61	0	0	0	62	146
Grand Total	3	5	7	0	0	15	14	276	5	0	0	295	8	8	6	0	0	22	7	247	3	0	0	257	**589**
Approach%	20%	33.3%	46.7%	0%		-	4.7%	93.6%	1.7%	0%		-	36.4%	36.4%	27.3%	0%		-	2.7%	96.1%	1.2%	0%		-	**-**
Totals %	0.5%	0.8%	1.2%	0%		2.5%	2.4%	46.9%	0.8%	0%		50.1%	1.4%	1.4%	1%	0%		3.7%	1.2%	41.9%	0.5%	0%		43.6%	**-**
PHF	0.38	0.42	0.88	0		0.75	0.5	0.88	0.63	0		0.86	0.67	0.5	0.5	0		0.79	0.58	0.89	0.25	0		0.93	**-**
Heavy	0	0	1	0		1	0	17	0	0		17	0	2	1	0		3	3	27	0	0		30	**-**
Heavy %	0%	0%	14.3%	0%		6.7%	0%	6.2%	0%	0%		5.8%	0%	25%	16.7%	0%		13.6%	42.9%	10.9%	0%	0%		11.7%	**-**
Lights	3	5	6	0		14	14	259	5	0		278	8	6	5	0		19	4	220	3	0		227	**-**
Lights %	100%	100%	85.7%	0%		93.3%	100%	93.8%	100%	0%		94.2%	100%	75%	83.3%	0%		86.4%	57.1%	89.1%	100%	0%		88.3%	**-**
Single-Unit Trucks	0	0	1	0		1	0	9	0	0		9	0	2	0	0		2	3	14	0	0		17	**-**
Single-Unit Trucks %	0%	0%	14.3%	0%		6.7%	0%	3.3%	0%	0%		3.1%	0%	25%	0%	0%		9.1%	42.9%	5.7%	0%	0%		6.6%	**-**
Buses	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	0	0	0	0		0	**-**
Buses %	0%	0%	0%	0%		0%	0%	0.4%	0%	0%		0.3%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Articulated Trucks	0	0	0	0		0	0	7	0	0		7	0	0	1	0		1	0	13	0	0		13	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	0%	2.5%	0%	0%		2.4%	0%	0%	16.7%	0%		4.5%	0%	5.3%	0%	0%		5.1%	**-**
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

Peak Hour: 04:45 PM - 05:45 PM Weather:

Start Time	N Approach OLD SECOND ROAD						E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						S Approach OLD SECOND ROAD						W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
16:45:00	2	1	3	0	0	6	17	90	1	0	0	108	3	6	2	0	0	11	3	100	4	0	0	107	232
17:00:00	0	0	1	0	0	1	14	81	2	0	0	97	5	1	5	0	0	11	1	89	2	0	0	92	201
17:15:00	1	4	4	0	0	9	5	75	2	0	0	82	2	13	4	0	0	19	4	97	2	0	0	103	213
17:30:00	2	4	2	0	0	8	12	83	1	0	0	96	1	4	3	1	0	9	4	86	5	0	0	95	208
Grand Total	5	9	10	0	0	24	48	329	6	0	0	383	11	24	14	1	0	50	12	372	13	0	0	397	**854**
Approach%	20.8%	37.5%	41.7%	0%		-	12.5%	85.9%	1.6%	0%		-	22%	48%	28%	2%		-	3%	93.7%	3.3%	0%		-	-
Totals %	0.6%	1.1%	1.2%	0%		2.8%	5.6%	38.5%	0.7%	0%		44.8%	1.3%	2.8%	1.6%	0.1%		5.9%	1.4%	43.6%	1.5%	0%		46.5%	-
PHF	0.63	0.56	0.63	0		0.67	0.71	0.91	0.75	0		0.89	0.55	0.46	0.7	0.25		0.66	0.75	0.93	0.65	0		0.93	-
Heavy	0	1	0	0		1	1	12	0	0		13	0	0	2	0		2	2	14	0	0		16	-
Heavy %	0%	11.1%	0%	0%		4.2%	2.1%	3.6%	0%	0%		3.4%	0%	0%	14.3%	0%		4%	16.7%	3.8%	0%	0%		4%	-
Lights	5	8	10	0		23	47	317	6	0		370	11	24	12	1		48	10	358	13	0		381	-
Lights %	100%	88.9%	100%	0%		95.8%	97.9%	96.4%	100%	0%		96.6%	100%	100%	85.7%	100%		96%	83.3%	96.2%	100%	0%		96%	-
Single-Unit Trucks	0	1	0	0		1	1	2	0	0		3	0	0	2	0		2	2	11	0	0		13	-
Single-Unit Trucks %	0%	11.1%	0%	0%		4.2%	2.1%	0.6%	0%	0%		0.8%	0%	0%	14.3%	0%		4%	16.7%	3%	0%	0%		3.3%	-
Buses	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	-
Buses %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	-
Articulated Trucks	0	0	0	0		0	0	10	0	0		10	0	0	0	0		0	0	3	0	0		3	-
Articulated Trucks %	0%	0%	0%	0%		0%	0%	3%	0%	0%		2.6%	0%	0%	0%	0%		0%	0%	0.8%	0%	0%		0.8%	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	-
Bicycles on Road%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-

Peak Hour: 11:00 AM - 12:00 PM Weather:

Peak Hour: 04:45 PM - 05:45 PM **Weather:**

Spectrum

Turning Movement Count
Location Name: OLD SECOND ROAD & COUNTY ROAD 22
Date: Fri, Aug 05, 2016 Deployment Lead: Theo Daglis

MMM Group Limited
MMM Group Limited
Thornhill ONTARIO, CANADA, L3T 0A1

Turning Movement Count (4 . OLD SECOND ROAD & COUNTY ROAD 22)

Start Time	N Approach OLD SECOND ROAD						E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						S Approach OLD SECOND ROAD						W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	U-Turn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	U-Turn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	U-Turn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	U-Turn W:W	Peds W:	Approach Total		
16:00:00	2	1	4	0	0	7	8	97	2	0	0	107	0	6	0	0	0	6	1	134	2	0	0	137	257	
16:15:00	2	2	1	0	0	5	3	80	1	0	0	84	3	4	4	0	0	11	1	155	0	0	0	156	256	
16:30:00	2	1	6	0	0	9	6	95	0	0	0	101	4	2	1	0	0	7	5	145	0	0	0	150	267	
16:45:00	0	1	3	0	0	4	6	101	4	0	0	111	2	4	0	0	0	6	1	141	2	0	0	144	265	1045
17:00:00	2	3	3	0	0	8	9	79	1	0	0	89	1	1	2	0	0	4	3	135	1	0	0	139	240	1028
17:15:00	2	5	2	0	0	9	8	82	2	0	0	92	5	6	1	0	0	12	1	138	6	0	0	145	258	1030
17:30:00	6	2	2	0	0	10	6	75	2	0	0	83	1	6	2	0	0	9	0	106	5	0	0	111	213	976
17:45:00	1	2	2	0	0	5	7	77	2	0	0	86	0	1	3	0	0	4	0	148	4	0	0	152	247	958
18:00:00	1	2	3	0	0	6	7	62	1	0	0	70	1	6	1	0	0	8	2	126	3	0	0	131	215	933
18:15:00	1	0	3	0	0	4	4	58	0	0	0	62	1	3	3	0	0	7	1	118	2	0	0	121	194	869
18:30:00	0	0	3	0	0	3	3	64	0	0	0	67	2	3	0	0	0	5	0	109	4	0	0	113	188	844
18:45:00	1	1	4	0	0	6	5	58	0	0	0	63	1	3	1	0	0	5	0	100	0	0	0	100	174	771
Grand Total	20	20	36	0	0	76	72	928	15	0	0	1015	21	45	18	0	0	84	15	1555	29	0	0	1599	**2774**	-
Approach%	26.3%	26.3%	47.4%	0%		-	7.1%	91.4%	1.5%	0%		-	25%	53.6%	21.4%	0%		-	0.9%	97.2%	1.8%	0%		-	**-**	-
Totals %	0.7%	0.7%	1.3%	0%		2.7%	2.6%	33.5%	0.5%	0%		36.6%	0.8%	1.6%	0.6%	0%		3%	0.5%	56.1%	1%	0%		57.6%	**-**	-
Heavy	0	1	2	0		-	2	28	1	0		-	1	0	1	0		-	2	44	0	0		-	**-**	-
Heavy %	0%	5%	5.6%	0%		-	2.8%	3%	6.7%	0%		-	4.8%	0%	5.6%	0%		-	13.3%	2.8%	0%	0%		-	**-**	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-

Peak Hour: 04:00 PM - 05:00 PM Weather:

Start Time	N Approach OLD SECOND ROAD						E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						S Approach OLD SECOND ROAD						W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
16:00:00	2	1	4	0	0	7	8	97	2	0	0	107	0	6	0	0	0	6	1	134	2	0	0	137	257
16:15:00	2	2	1	0	0	5	3	80	1	0	0	84	3	4	4	0	0	11	1	155	0	0	0	156	256
16:30:00	2	1	6	0	0	9	6	95	0	0	0	101	4	2	1	0	0	7	5	145	0	0	0	150	267
16:45:00	0	1	3	0	0	4	6	101	4	0	0	111	2	4	0	0	0	6	1	141	2	0	0	144	265
Grand Total	6	5	14	0	0	25	23	373	7	0	0	403	9	16	5	0	0	30	8	575	4	0	0	587	**1045**
Approach%	24%	20%	56%	0%		-	5.7%	92.6%	1.7%	0%		-	30%	53.3%	16.7%	0%		-	1.4%	98%	0.7%	0%		-	**-**
Totals %	0.6%	0.5%	1.3%	0%		2.4%	2.2%	35.7%	0.7%	0%		38.6%	0.9%	1.5%	0.5%	0%		2.9%	0.8%	55%	0.4%	0%		56.2%	**-**
PHF	0.75	0.63	0.58	0		0.69	0.72	0.92	0.44	0		0.91	0.56	0.67	0.31	0		0.68	0.4	0.93	0.5	0		0.94	**-**
Heavy	0	0	2	0		2	0	14	1	0		15	1	0	1	0		2	2	19	0	0		21	**-**
Heavy %	0%	0%	14.3%	0%		8%	0%	3.8%	14.3%	0%		3.7%	11.1%	0%	20%	0%		6.7%	25%	3.3%	0%	0%		3.6%	**-**
Lights	6	5	12	0		23	23	359	6	0		388	8	16	4	0		28	6	556	4	0		566	**-**
Lights %	100%	100%	85.7%	0%		92%	100%	96.2%	85.7%	0%		96.3%	88.9%	100%	80%	0%		93.3%	75%	96.7%	100%	0%		96.4%	**-**
Single-Unit Trucks	0	0	2	0		2	0	12	0	0		12	1	0	1	0		2	2	10	0	0		12	**-**
Single-Unit Trucks %	0%	0%	14.3%	0%		8%	0%	3.2%	0%	0%		3%	11.1%	0%	20%	0%		6.7%	25%	1.7%	0%	0%		2%	**-**
Buses	0	0	0	0		0	0	1	0	0		1	0	0	0	0		0	0	0	0	0		0	**-**
Buses %	0%	0%	0%	0%		0%	0%	0.3%	0%	0%		0.2%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Articulated Trucks	0	0	0	0		0	0	1	1	0		2	0	0	0	0		0	0	9	0	0		9	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0.3%	14.3%	0%		0.5%	0%	0%	0%	0%		0%	0%	1.6%	0%	0%		1.5%	**-**

Peak Hour: 04:00 PM - 05:00 PM Weather:

18:30:00	5	10	4	0	0	19	6	38	3	0	0	47	8	13	6	0	0	27	21	44	6	0	0	71	164	742
18:45:00	5	13	3	0	0	21	5	35	4	0	0	44	3	8	6	0	0	17	6	46	8	0	0	60	142	676
Grand Total	177	474	234	0	0	885	211	1614	150	0	2	1975	166	491	380	0	2	1037	408	1698	241	0	0	2347	**6244**	-
Approach%	20%	53.6%	26.4%	0%		-	10.7%	81.7%	7.6%	0%		-	16%	47.3%	36.6%	0%		-	17.4%	72.3%	10.3%	0%		-	**-**	-
Totals %	2.8%	7.6%	3.7%	0%		14.2%	3.4%	25.8%	2.4%	0%		31.6%	2.7%	7.9%	6.1%	0%		16.6%	6.5%	27.2%	3.9%	0%		37.6%	**-**	-
Heavy	5	23	9	0		-	4	107	12	0		-	5	31	21	0		-	33	160	9	0		-	**-**	-
Heavy %	2.8%	4.9%	3.8%	0%		-	1.9%	6.6%	8%	0%		-	3%	6.3%	5.5%	0%		-	8.1%	9.4%	3.7%	0%		-	**-**	-
Bicycles	0	3	1	0		-	0	0	0	0		-	1	2	0	0		-	2	0	0	0		-	**-**	-
Bicycle %	0%	0.6%	0.4%	0%		-	0%	0%	0%	0%		-	0.6%	0.4%	0%	0%		-	0.5%	0%	0%	0%		-	**-**	-

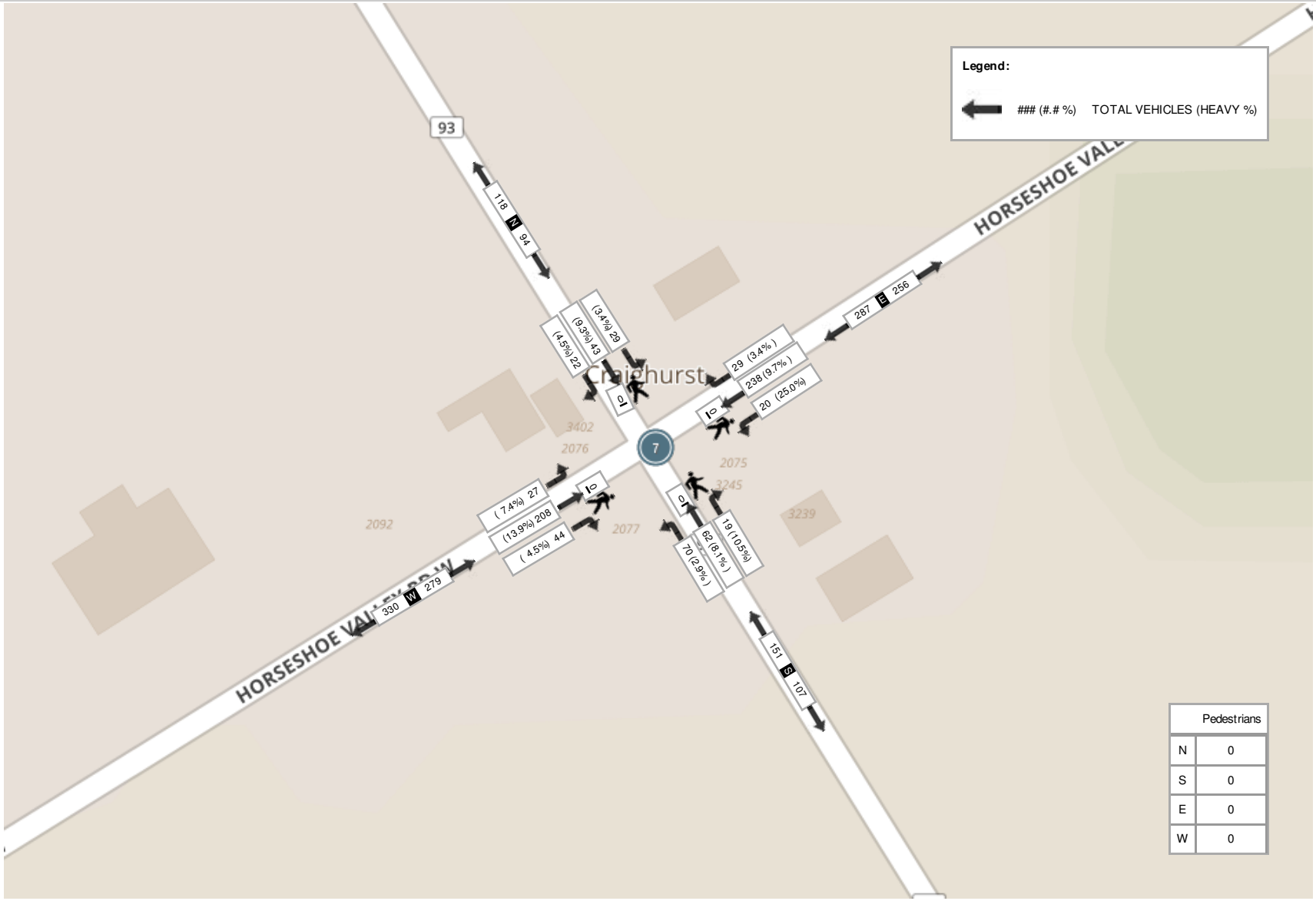
Peak Hour: 10:45 AM - 11:45 AM Weather:

Start Time	N Approach COUNTY ROAD 93 (PENETANGUISHENE RD)						E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						S Approach COUNTY ROAD 93 (PENETANGUISHENE RD)						W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
10:45:00	6	11	6	0	0	23	4	74	8	0	0	86	6	15	9	0	0	30	8	60	5	0	0	73	212
11:00:00	8	15	6	0	0	29	10	66	4	0	0	80	1	16	17	0	0	34	19	50	8	0	0	77	220
11:15:00	5	6	9	0	0	20	4	53	6	0	0	63	5	16	22	0	0	43	8	50	8	0	0	66	192
11:30:00	3	11	8	0	0	22	11	45	2	0	0	58	7	15	22	0	0	44	9	48	6	0	0	63	187
Grand Total	22	43	29	0	0	94	29	238	20	0	0	287	19	62	70	0	0	151	44	208	27	0	0	279	**811**
Approach%	23.4%	45.7%	30.9%	0%		-	10.1%	82.9%	7%	0%		-	12.6%	41.1%	46.4%	0%		-	15.8%	74.6%	9.7%	0%		-	**-**
Totals %	2.7%	5.3%	3.6%	0%		11.6%	3.6%	29.3%	2.5%	0%		35.4%	2.3%	7.6%	8.6%	0%		18.6%	5.4%	25.6%	3.3%	0%		34.4%	**-**
PHF	0.69	0.72	0.81	0		0.81	0.66	0.8	0.63	0		0.83	0.68	0.97	0.8	0		0.86	0.58	0.87	0.84	0		0.91	**-**
Heavy	1	4	1	0		6	1	23	5	0		29	2	5	2	0		9	2	29	2	0		33	**-**
Heavy %	4.5%	9.3%	3.4%	0%		6.4%	3.4%	9.7%	25%	0%		10.1%	10.5%	8.1%	2.9%	0%		6%	4.5%	13.9%	7.4%	0%		11.8%	**-**
Lights	21	39	28	0		88	28	215	15	0		258	17	57	68	0		142	42	179	25	0		246	**-**
Lights %	95.5%	90.7%	96.6%	0%		93.6%	96.6%	90.3%	75%	0%		89.9%	89.5%	91.9%	97.1%	0%		94%	95.5%	86.1%	92.6%	0%		88.2%	**-**
Single-Unit Trucks	0	2	1	0		3	0	19	1	0		20	1	2	1	0		4	1	17	2	0		20	**-**
Single-Unit Trucks %	0%	4.7%	3.4%	0%		3.2%	0%	8%	5%	0%		7%	5.3%	3.2%	1.4%	0%		2.6%	2.3%	8.2%	7.4%	0%		7.2%	**-**
Buses	0	0	0	0		0	0	1	4	0		5	1	0	0	0		1	0	0	0	0		0	**-**
Buses %	0%	0%	0%	0%		0%	0%	0.4%	20%	0%		1.7%	5.3%	0%	0%	0%		0.7%	0%	0%	0%	0%		0%	**-**
Articulated Trucks	1	2	0	0		3	1	3	0	0		4	0	3	1	0		4	1	12	0	0		13	**-**
Articulated Trucks %	4.5%	4.7%	0%	0%		3.2%	3.4%	1.3%	0%	0%		1.4%	0%	4.8%	1.4%	0%		2.6%	2.3%	5.8%	0%	0%		4.7%	**-**
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

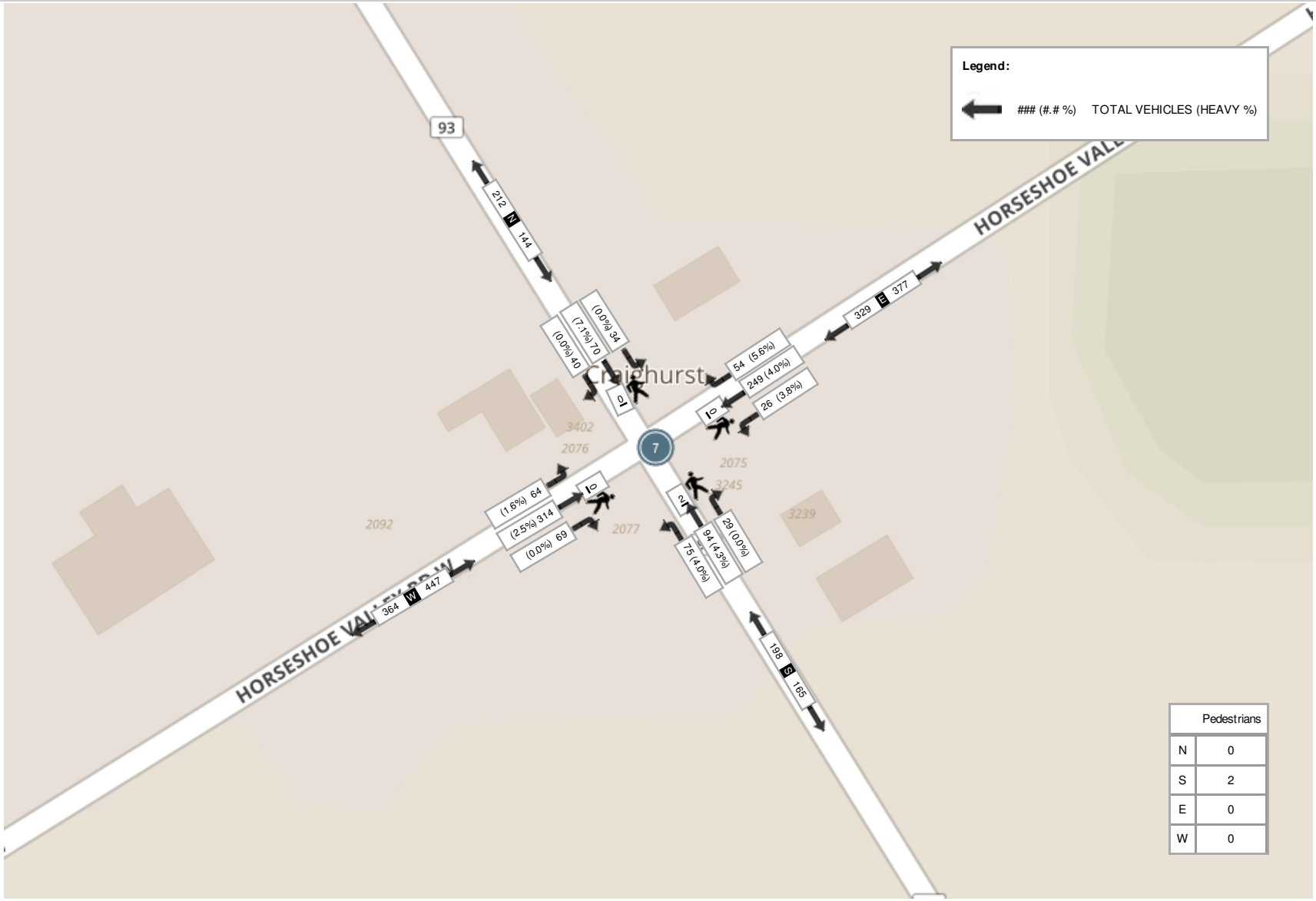
Peak Hour: 04:45 PM - 05:45 PM Weather:

Start Time	N Approach COUNTY ROAD 93 (PENETANGUISHENE RD)						E Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						S Approach COUNTY ROAD 93 (PENETANGUISHENE RD)						W Approach COUNTY ROAD 22 (HORSESHOE VALLEY RD W)						Int. Total (15 min)
	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	Right	Thru	Left	U-Turn	Peds	Approach Total	
16:45:00	8	20	6	0	0	34	18	66	8	0	0	92	7	23	17	0	0	47	14	87	23	0	0	124	297
17:00:00	14	16	9	0	0	39	16	69	11	0	0	96	12	26	23	0	0	61	15	80	13	0	0	108	304
17:15:00	7	22	8	0	0	37	11	52	3	0	0	66	7	17	19	0	1	43	22	73	16	0	0	111	257
17:30:00	11	12	11	0	0	34	9	62	4	0	0	75	3	28	16	0	1	47	18	74	12	0	0	104	260
Grand Total	40	70	34	0	0	144	54	249	26	0	0	329	29	94	75	0	2	198	69	314	64	0	0	447	**1118**
Approach%	27.8%	48.6%	23.6%	0%		-	16.4%	75.7%	7.9%	0%		-	14.6%	47.5%	37.9%	0%		-	15.4%	70.2%	14.3%	0%		-	**-**
Totals %	3.6%	6.3%	3%	0%		12.9%	4.8%	22.3%	2.3%	0%		29.4%	2.6%	8.4%	6.7%	0%		17.7%	6.2%	28.1%	5.7%	0%		40%	**-**
PHF	0.71	0.8	0.77	0		0.92	0.75	0.9	0.59	0		0.86	0.6	0.84	0.82	0		0.81	0.78	0.9	0.7	0		0.9	**-**
Heavy	0	5	0	0		5	3	10	1	0		14	0	4	3	0		7	0	8	1	0		9	**-**
Heavy %	0%	7.1%	0%	0%		3.5%	5.6%	4%	3.8%	0%		4.3%	0%	4.3%	4%	0%		3.5%	0%	2.5%	1.6%	0%		2%	**-**
Lights	40	65	34	0		139	51	239	25	0		315	29	90	72	0		191	69	306	63	0		438	**-**
Lights %	100%	92.9%	100%	0%		96.5%	94.4%	96%	96.2%	0%		95.7%	100%	95.7%	96%	0%		96.5%	100%	97.5%	98.4%	0%		98%	**-**
Single-Unit Trucks	0	4	0	0		4	2	5	0	0		7	0	2	1	0		3	0	6	1	0		7	**-**
Single-Unit Trucks %	0%	5.7%	0%	0%		2.8%	3.7%	2%	0%	0%		2.1%	0%	2.1%	1.3%	0%		1.5%	0%	1.9%	1.6%	0%		1.6%	**-**
Buses	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	**-**
Buses %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Articulated Trucks	0	1	0	0		1	1	5	1	0		7	0	2	2	0		4	0	2	0	0		2	**-**
Articulated Trucks %	0%	1.4%	0%	0%		0.7%	1.9%	2%	3.8%	0%		2.1%	0%	2.1%	2.7%	0%		2%	0%	0.6%	0%	0%		0.4%	**-**
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	100%		-	-	-	-	0%		**-**
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	**-**
Bicycles on Road%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

Peak Hour: 10:45 AM - 11:45 AM Weather:



Peak Hour: 04:45 PM - 05:45 PM Weather:



2004

MICROPROCESSOR MODEL 170

LOCATION SIMCOE Rd 27 + SIMCOE Rd 22

TIMING BASED ON T.M DATED JULY 94

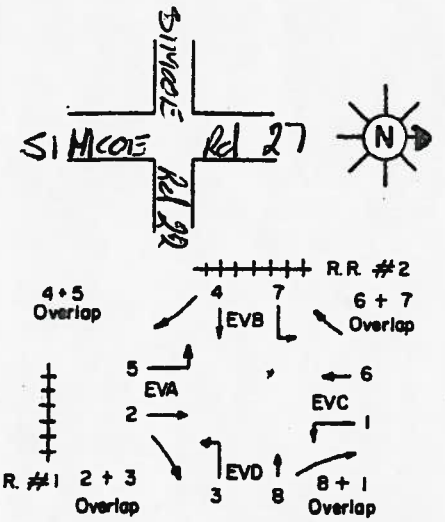
TIMING INSTALLATION DATE _____

INSTALLED BY _____

DISTRICT _____

PROGRAM NUMBER (C-C-O) 114

PROM CHECK SUM 1 (F-9-A) 77 ; 2 (F-9-B) 124



LAG FAZES	1	2	3	4	5	6	7	8
LAGS C-F-O		X		X		X		X

~~For Central Computer Control (C=0-6)= 0~~

FAZE FUNCTION FLAGS		FAZE # 1	2	3	4	5	6	7	8
PERMIT	0		X		X		X		X
RED LOCK	1								
AMBER LOCK	2		X				X		
VEH. RECALL	3		X				X		
PED. RECALL	4								
VEH. MAX. RECALL	5								
OVERLAP A	6								
OVERLAP B	7								
DBL. ENTRY	8		X		X		X		X
RED TIMING RNG.	9								
ARROW ADV. GREEN	A								
RED REST	B								
REST IN WALK	C								
FLASHING GREEN	D								
STARTUP	E		X				X		
(Reserved)	F								

KEYSTROKES F- F - FUNCTION #

KEYSTROKES F- FAZE # - INTERVAL #

FAZE AND PREEMPT TIMES		FAZE # 1	2	3	4	5	6	7	8	PREEMPT	E	
WALK	0		—		—		—		—	RRI DELAY		Q
FLASH D/W	1		—		—		—		—	RRI CLEAR		1
MIN. GREEN	2		20		10		20		10	EV A DELAY		2
TYPE 3 DET.	3		—		—		—		—	EV A CLEAR		3
ADD/VEH	4	•	1·0	•	—	•	2·0	•	—	EV B DELAY		4
VEH. EXTEN.	5	•	4·0	•	3·0	•	4·0	•	3·0	EV B CLEAR		5
MAX. GAP	6	•	4·0	•	3·0	•	4·0	•	3·0	EV C DELAY		6
MIN. GAP	7	•	4·0	•	3·0	•	4·0	•	3·0	EV C CLEAR		7
MAX. EXTEN.	8		40		20		40		30	EV D DELAY		8
MAX. 2	9		—		—		70		—	EV D CLEAR		9
CALL TO FAZE	A									RR2 DELAY		A
GRN CLEAR	B	•		•		•		•		RR2 CLEAR		B
REDUCE BY	C	•	—	•	—	•	—	•	—	EV CLR. TMR.		C
REDUCE EVERY	D	•	—	•	—	•	—	•	—	EV DLY. TMR		D
AMBER	E	•	5·9	•	6·9	•	5·9	•	5·9	RR CLR. TMR.		E
RED CLEAR	F	•	1·9	•	1·2	•	1·9	•	1·2	RR DLY. TMR.		F

MAX. INITIAL (F-O-E): 30

RED REVERT (F-O-F): 5.0

PREFERRED LEFT TURN: MAIN ST. (F-O-C)_____ (1 or 5) or SIDE ST. (F-O-D)_____ (3 or 7)

EMERG. VEH. FAZES: EVA - FAZE 2 WITH (F-C-A)_____ (5 or 6)

EVB - FAZE 4 WITH (F-C-B)_____ (7 or 8)

DETECTION FAZE	1	2		3	4		5	6		7	8	
		Pres.	L.D.		Pres.	L.D.		Pres.	L.D.		Pres	L.D.
DELAY					10						10	
CARRY OVER	•	•	•	•	•	•	•	•	•	•	•	•

Pres. Presence Detection at Stop Bar L.D. Long Distance Detection

TIMINGS TO BE USED DURING LOSS OF DETECTION

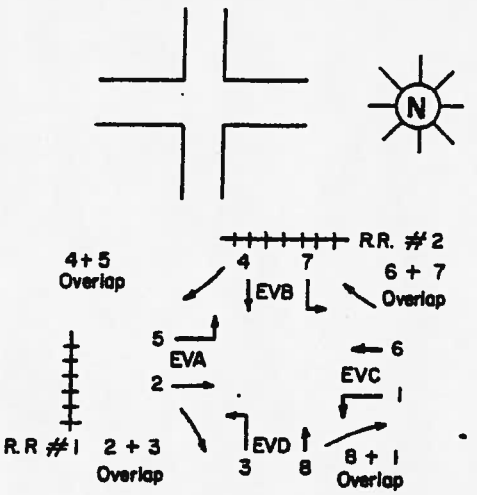
LOCATION _____ DISTRICT _____

TIMING BASED ON T.M. DATED July 94

PROGRAM NUMBER (C-G-O) 114

RECORD INSTALLATION DATES ON REVERSE SIDE

CHANGES FROM NORMAL TIMING ARE CIRCLED. PROM CHECK SUM 1(F-9-A) 77 ; 2 (F-9-B) 124
IMPLEMENT ONLY ON FAZES WHERE APPLICABLE.
IF APPLICABLE, USE WITH OR DISABLE 'TIME OF DAY FUNCTIONS'



LAG FAZES	1	2	3	4	5	6	7	8
LAGS C-F-O		X		X		X		X

~~For Central Computer Control (C-O-6)= 0~~

FAZE FUNCTION FLAGS		FAZE # 1	2	3	4	5	6	7	8
PERMIT	0		X		X		X		X
RED LOCK	1								
AMBER LOCK	2		X				X		
VEH RECALL	3		X		(X)		X		(X)
PED RECALL	4								
VEH. MAX. RECALL	5								
OVERLAP A	6								
OVERLAP B	7								
DBL. ENTRY	8		X		X		X		X
RED TIMING RNG	9								
ARROW ADV GREEN	A								
RED REST	B								
REST IN WALK	C								
FLASHING GREEN	D								
STARTUP	E		X				X		
(Reserved)	F								

KEYSTROKES: F- F- FUNCTION #

FAZE AND PREEMPT TIMES		1	2	3	4	5	6	7	8	PREEMPT	E	
WALK	0		—		—		—		—	RRI DELAY		0
FLASH D/W	1		—		—		—		—	RRI CLEAR		1
MIN. GREEN	2		(40)		(15)		(40)		(15)	EV A DELAY		2
TYPE 3 DET.	3		—		—		—		—	EV A CLEAR		3
ADD/VEH	4	.	1.0	.	—	.	2.0	.	—	EV B DELAY		4
VEH. EXTEN	5	.	4.0	.	3.0	.	4.0	.	3.0	EV B CLEAR		5
MAX. GAP	6	.	4.0	.	3.0	.	4.0	.	3.0	EV C DELAY		6
MIN. GAP	7	.	4.0	.	3.0	.	4.0	.	3.0	EV C CLEAR		7
MAX. EXTEN	8		(20)		(15)		(20)		(15)	EV D DELAY		8
MAX. 2	9						(40)			EV D CLEAR		9
CALL TO FAZE	A									RR2 DELAY		A
GRN CLEAR	B	.		.		.		.		RR2 CLEAR		B
REDUCE BY	C	.	—	.	—	.	—	.	—	EV CLR. TMR.		C
REDUCE EVERY	D	.	—	.	—	.	—	.	—	EV DLY. TMR		D
AMBER	E	.	5.9	.	5.9	.	5.9	.	5.9	RR CLR. TMR.		E
RED CLEAR	F	.	1.9	.	1.2	.	1.9	.	1.2	RR DLY. TMR.		F

KEYSTROKES: F- FAZE # - INTERVAL #

MAX. INITIAL (F-O-E)= 30 RED REVERT (F-O-F)= 5.0

PREFERRED LEFT TURN: MAIN ST. (F-O-C)_____ (1 or 5) or SIDE ST. (F-O-D)_____ (3 or 7)

EMERG. VEH. FAZES: EVA-FAZE 2 WITH (F-C-A)_____ (5 or 6)

EVB-FAZE 4 WITH (F-C-B)_____ (7 or 8)

DETECTION FAZE	1	2		3	4		5	6		7	8	
		Pres.	L.D.		Pres.	L.D.		Pres.	L.D.		Pres.	L.D.
DELAY					10						10	
CARRY OVER	.	.	.	.	.	.	.	.	.	.	.	.

Pres. Presence Detection of Stop Bar L.D. Long Distance Detection

NOTE: EV Delays must be greater than E1 E3 E5 or E7 Minimum Greens

FIGURE B

MICROPROCESSOR MODEL 170
LOCAL TIME OF DAY FUNCTIONS
(PROGRAM # 114)

LOCATION: SIMCOE Rd 27 + SIMCOE Rd 22 DISTRICT: _____

DATE INSTALLED: _____ INSTALLED BY: _____

FOR ACTUATED + PRETIMED

	TIME OF DAY		DAY OF WEEK						
	HOUR & MINUTE	FUNC.	1	2	3	4	5	6	7
0									
1	1300	9	X	X					
2	2200	9	X	X					
3	1300	5	X	X					
4	2200	5	X	X					
5									
6									
7									
8									
9									
A									
B									
C									
D									
E									
F									

KEYSTROKES: 7 - SETTING #

	FAZE (or Bit) FLAGS							
	1	2	3	4	5	6	7	8
0								
1						X		
2								
3						X		
4								
5								
6								
7								
8								
9								
A								
B								
C								
D								
E								
F								

OMIT LINE "0"

ACTUATED + PRETIME

PRETIMED ONLY

KEYSTROKES:
D - F - SETTING #

FUNCTION	DESCRIPTION	FLAGS
0	"ALLOWED FAZES"	by faze
3	"VEHICLE RECALL"	by faze
4	"PEDESTRIAN RECALL"	by faze
5	"VEHICLE MAX RECALL"	by faze
7	"AUX. OUTPUT 7 FILE" (8)	by bit 1-8
9	"MAXIMUM EXTENSION 2"	by faze
F	"CABINET FLASH"	bit 6

TO ENABLE TIME OF DAY FUNCTIONS (F-0-8) = 1

TO DISABLE TIME OF DAY FUNCTIONS (F-0-8) = 0

TO ENTER REAL TIME

Access (8-0)

Enter Hour (2 Digits), Minutes (2 Digits), 0 Secs, Press E

Enter Day Of Week on Call/Active Lights (Sunday is 1)

Access (8-1)

Enter Day (2 Digits), Year (2 Digits), Month (1 Digit) Press E
('A' is Oct.)

HOLIDAY SELECTION

	DATE			IMPLEMENT DAY						
	DAY	YEAR	MONTH	1	2	3	4	5	6	7
0										
1										
2										
3										
4										
5										
6										
7										
8										
9										
A										
B										
C										
D										
E										
F										

KEYSTROKES: 9 - SETTING #

Ontario

DETECTOR INPUT FILES 'I' and 'J'

'I' UPPER

D-1-X SET DELAY
D-3-X SET CARRY
D-5-X OBS VEH CT
D-7-X OBS DELAY
D-9-X OBS CARRY

'I' LOWER

1	2	3	4	5	6	7	8	9	10	11	12	13	14
F1 Ex,CT D-1-0 D-3-0 D-5-0 D-7-0 D-9-0	F2 Ex,CT D-1-1 D-3-1 D-5-1 D-7-1 D-9-1 F2 Ex,CT D-1-2 D-3-2 D-5-2 D-7-2 D-9-2	F2 Ex,CT D-1-3 D-3-3 D-5-3 D-7-3 D-9-3 7 WIRE INTRCNT WIRE 4 COMPUTER FORCE 8	F2 CALL D-1-5 D-3-5 D-7-5 D-9-5	F3 Ex,CT D-1-6 D-3-6 D-5-6 D-7-6 D-9-6	F4 Ex,CT D-1-7 D-3-7 D-5-7 D-7-7 D-9-7 F4 Ex,CT D-1-8 D-3-8 D-5-8 D-7-8 D-9-8	F4 Ex,CT D-1-9 D-3-9 D-5-9 D-7-9 D-9-9 7 WIRE INTRCNT WIRE 1 COMPUTER HOLD ON LINE	F4 CALL D-1-8 D-3-8 D-7-8 D-9-8	F1 Ex,CT D-1-C D-3-C D-5-C D-7-C D-9-C F3 Ex,CT D-1-D D-3-D D-5-D D-7-D D-9-D	7 WIRE INTRCNT WIRE 4 COMPUTER FORCE B 7 WIRE INTRCNT WIRE 1 COMPUTER HOLD ON LINE	MONITOR COMM. UNDEL. CONFL.	F2 PED F4 PED	F6 PED F8 PED	FLASH SENSE STOP TIME

Ex,CT = DETECTORS PLACE EXTENSIONS AND COUNTS INTO THE CONTROLLER.

INPUT FILE 'I'

CALL = DETECTORS PLACE A SINGLE CALL INTO THE CONTROLLER.
EVA = EMERGENCY VEHICLE PREEMPT.

'J' UPPER

D-2-X SET DELAY
D-4-X SET CARRY
D-6-X OBS VEH CT
D-8-X OBS DELAY
D-A-X OBS CARRY

'J' LOWER

1	2	3	4	5	6	7	8	9	10	11	12	13	14
F5 Ex,CT D-2-0 D-4-0 D-6-0 D-8-0 D-A-0	F6 Ex,CT D-2-1 D-4-1 D-6-1 D-8-1 D-A-1 F6 Ex,CT D-2-2 D-4-2 D-6-2 D-8-2 D-A-2	F6 Ex,CT D-2-3 D-4-3 D-6-3 D-8-3 D-A-3 7 WIRE INTRCNT WIRE 5 COMPUTER SPEC. FUN	F6 CALL D-2-5 D-4-5 D-8-5 D-A-5	F7 Ex,CT D-2-6 D-4-6 D-6-6 D-8-6 D-A-6	F8 Ex,CT D-2-7 D-4-7 D-6-7 D-8-7 D-A-7 F8 Ex,CT D-2-8 D-4-8 D-6-8 D-8-8 D-A-8	F8 Ex,CT D-2-9 D-4-9 D-6-9 D-8-9 D-A-9 7 WIRE INTRCNT WIRE 2 COMPUTER YIELD	F8 CALL D-2-8 D-4-8 D-8-8 D-A-8	F5 Ex,CT D-2-C D-4-C D-6-C D-8-C D-A-C F7 Ex,CT D-2-D D-4-D D-6-D D-8-D D-A-D	7 WIRE INTRCNT WIRE 5 COMPUTER SPEC. FUN 7 WIRE INTRCNT WIRE 2 COMPUTER YIELD	7 WIRE INTRCNT FREE WIRE 6 FLASH 7 WIRE INTRCNT WIRE 3 COMPUTER FORCE A	EVA F2 & 6 or F2 & 5 EVC F1 & 6	EVB F4 & 8 or F4 & 7 EVD F3 & 8	RR 1 ALL RED F2 & 5 TRK CLR RR 2 F4 & 7 TRK CLR

INPUT FILE 'J'

INPUT FILE DETECTOR ACCESS CODE CHART (332 CABINET)
ONTARIO LOCAL PROGRAM
WITH CENTRAL COMPUTER CONTROL OR 7 WIRE INTERCONNECT
(FOR VER. 114 SOFTWARE 1986)

FIGURE D

2007

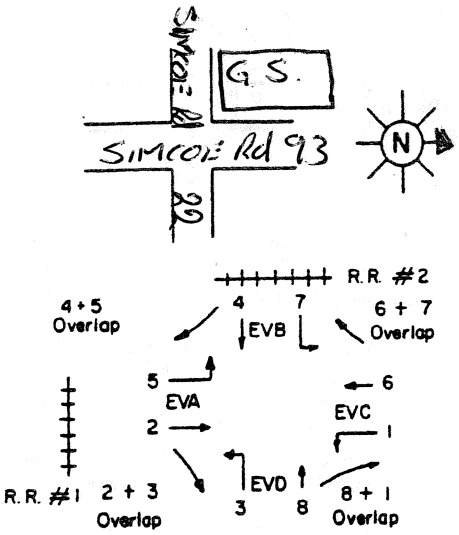
MICROPROCESSOR MODEL 170

LOCATION Simcoe Rd 93 & Simcoe Rd 22 DISTRICT CRAIGHURST

TIMING BASED ON T.M DATED _____ PROGRAM NUMBER (C-C-O) 114

TIMING INSTALLATION DATE OCT 7/99

INSTALLED BY Doug Austin PROM CHECK SUM 1(F-9-A) 77 ; 2(F-9-B) 124



LAG FAZES	1	2	3	4	5	6	7	8
LAGS C-F-O		X		X		X		X

~~For Central Computer Control (C-O-6) = 0~~

FAZE FUNCTION FLAGS		FAZE # 1	2	3	4	5	6	7	8
PERMIT	0		X		X		X		X
RED LOCK	1								
AMBER LOCK	2		X				X		
VEH. RECALL	3								
PED. RECALL	4		X				X		
VEH. MAX. RECALL	5								
OVERLAP A	6								
OVERLAP B	7								
DBL. ENTRY	8		X		X		X		X
RED TIMING RNG.	9								
ARROW ADV. GREEN	A								
RED REST	B								
REST IN WALK	C		X				X		
FLASHING GREEN	D								
STARTUP	E		X				X		
(Reserved)	F								

KEYSTROKES F – F – FUNCTION #

FAZE AND PREEMPT TIMES		FAZE # 1	2	3	4	5	6	7	8	KEYSTROKES F – FAZE # – INTERVAL # PREEMPT	E	
WALK	0		15		13		15		13	RRI DELAY		Q
FLASH D/W	1		5		5		5		5	RRI CLEAR		1
MIN. GREEN	2		20		18		20		18	EV A DELAY		2
TYPE 3 DET.	3									EV A CLEAR		3
ADD/VEH	4	•	2.0	•	—	•	2.0	•	—	EV B DELAY		4
VEH. EXTEN.	5	•	4.5	•	4.5	•	4.5	•	4.5	EV B CLEAR		5
MAX. GAP	6	•	4.5	•	4.5	•	4.5	•	4.5	EV C DELAY		6
MIN. GAP	7	•	4.5	•	4.5	•	4.5	•	4.5	EV C CLEAR		7
MAX. EXTEN.	8		25		25		25		25	EV D DELAY		8
MAX. 2	9									EV D CLEAR		9
CALL TO FAZE	A									RR2 DELAY		A
GRN CLEAR	B	•		•		•		•		RR2 CLEAR		B
REDUCE BY	C	•	•	•	•	•	•	•	•	EV CLR. TMR.		C
REDUCE EVERY	D	•	•	•	•	•	•	•	•	EV DLY. TMR		D
AMBER	E	•	4.0	•	4.0	•	4.0	•	4.0	RR CLR. TMR.		E
RED CLEAR	F	•	2.0	•	2.0	•	2.0	•	2.0	RR DLY. TMR.		F

MAX. INITIAL (F-O-E) = 30 RED REVERT (F-O-F) = 5.0

PREFERRED LEFT TURN: MAIN ST. (F-O-C) _____ (1 or 5) or SIDE ST. (F-O-D) _____ (3 or 7)

EMERG. VEH. FAZES: EVA-FAZE 2 WITH (F-C-A) _____ (5 or 6)

EVB-FAZE 4 WITH (F-C-B) _____ (7 or 8)

DETECTION FAZE	1	2		3	4		5	6		7	8	
		Pres.	L.D.		Pres.	L.D.		Pres.	L.D.		Pres	L.D.
DELAY												
CARRY OVER	•	•	•	•	•	•	•	•	•	•	•	•

Pres. Presence Detection at Stop Bar L.D. Long Distance Detection

County of Simcoe

Transportation and Engineering Department
Midhurst, Ontario
(705)-726-9300

County Road 22 - Spring 2014
Highway 400 to
County Road 27

Site Code: 022 05

Highway 400
County Road 27

Start	12-May-14		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	4	9	5	4	3	11	7	4	*	*	*	*	*	*	5	7
01:00	5	4	7	3	5	4	8	7	*	*	*	*	*	*	6	4
02:00	3	6	6	5	4	3	9	9	*	*	*	*	*	*	6	6
03:00	17	4	11	5	12	6	10	11	*	*	*	*	*	*	12	6
04:00	54	23	51	21	56	24	49	26	*	*	*	*	*	*	52	24
05:00	122	69	107	66	101	71	109	79	*	*	*	*	*	*	110	71
06:00	193	129	202	133	174	136	175	102	*	*	*	*	*	*	186	125
07:00	**215**	**178**	**217**	**184**	**215**	**184**	**222**	**195**	*	*	*	*	*	*	**217**	**185**
08:00	189	132	177	145	191	129	175	153	*	*	*	*	*	*	183	140
09:00	177	126	167	117	159	127	204	119	*	*	*	*	*	*	177	122
10:00	188	156	152	138	160	148	204	125	*	*	*	*	*	*	176	142
11:00	154	159	162	153	190	143	206	137	*	*	*	*	*	*	178	148
12:00 PM	154	154	153	139	161	140	199	154	*	*	*	*	*	*	167	147
01:00	162	155	175	161	167	163	232	188	*	*	*	*	*	*	184	167
02:00	173	199	213	171	180	180	251	190	*	*	*	*	*	*	204	185
03:00	219	197	227	247	227	239	284	247	*	*	*	*	*	*	239	232
04:00	**255**	**235**	**238**	**261**	**265**	**279**	**292**	**269**	*	*	*	*	*	*	**262**	**261**
05:00	149	189	170	209	196	212	230	180	*	*	*	*	*	*	186	198
06:00	105	95	115	128	137	102	145	136	*	*	*	*	*	*	126	115
07:00	83	85	79	82	101	70	137	102	*	*	*	*	*	*	100	85
08:00	49	67	67	64	78	62	104	68	*	*	*	*	*	*	74	65
09:00	22	35	37	38	37	47	44	67	*	*	*	*	*	*	35	47
10:00	21	17	15	17	36	23	15	38	*	*	*	*	*	*	22	24
11:00	6	15	10	15	10	12	9	15	*	*	*	*	*	*	9	14
Lane	2719	2438	2763	2506	2865	2515	3320	2621	0	0	0	0	0	0	2916	2520
Day	5157		5269		5380		5941		0		0		0		5436	
AM Peak	07:00	07:00	07:00	07:00	07:00	07:00	07:00	07:00	-	-	-	-	-	-	07:00	07:00
Vol.	215	178	217	184	215	184	222	195	-	-	-	-	-	-	217	185
PM Peak	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	-	-	-	-	-	-	16:00	16:00
Vol.	255	235	238	261	265	279	292	269	-	-	-	-	-	-	262	261

Comb. Total	5157	5269	5380	5941	0	0	0	5436

ADT ADT 5,437 AADT 5,437

County of Simcoe

Transportation and Engineering Department
Midhurst, Ontario
(705)-726-9300

County Road 22 - Summer 2014
Highway 400 to
County Road 27

Site Code: 022 05

Highway 400
County Road 27

Start	14-Jul-14		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	25	45	13	15	8	82	19	24	*	*	*	*	*	*	16	42
01:00	12	19	7	9	6	44	12	12	*	*	*	*	*	*	9	21
02:00	8	15	6	2	3	13	4	7	*	*	*	*	*	*	5	9
03:00	6	6	4	7	4	10	5	10	*	*	*	*	*	*	5	8
04:00	3	2	9	8	3	7	6	6	*	*	*	*	*	*	5	6
05:00	26	14	34	16	29	17	36	14	*	*	*	*	*	*	31	15
06:00	97	53	102	53	108	55	118	65	*	*	*	*	*	*	106	56
07:00	158	94	147	99	173	105	159	119	*	*	*	*	*	*	159	104
08:00	185	143	213	150	213	161	220	167	*	*	*	*	*	*	208	155
09:00	**233**	164	202	150	207	166	196	136	*	*	*	*	*	*	210	154
10:00	196	200	195	155	213	151	242	161	*	*	*	*	*	*	212	167
11:00	229	**225**	**224**	**200**	**235**	**215**	**245**	**205**	*	*	*	*	*	*	**233**	**211**
12:00 PM	251	232	227	234	231	203	242	221	*	*	*	*	*	*	238	222
01:00	263	246	227	220	209	231	266	247	*	*	*	*	*	*	241	236
02:00	222	241	247	210	227	234	249	230	*	*	*	*	*	*	236	229
03:00	208	227	230	218	244	213	275	226	*	*	*	*	*	*	239	221
04:00	275	278	259	221	272	253	**322**	265	*	*	*	*	*	*	282	254
05:00	**321**	**342**	**299**	**306**	**315**	**270**	319	**315**	*	*	*	*	*	*	**314**	**308**
06:00	197	272	250	261	259	260	282	302	*	*	*	*	*	*	247	274
07:00	162	138	157	138	157	155	241	165	*	*	*	*	*	*	179	149
08:00	127	108	121	115	135	137	151	129	*	*	*	*	*	*	134	122
09:00	100	82	122	89	97	112	156	112	*	*	*	*	*	*	119	99
10:00	63	56	72	60	84	67	78	68	*	*	*	*	*	*	74	63
11:00	27	32	33	47	21	46	33	45	*	*	*	*	*	*	28	42
Lane	3394	3234	3400	2983	3453	3207	3876	3251	0	0	0	0	0	0	3530	3167
Day	6628		6383		6660		7127		0		0		0		6697	
AM Peak	09:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00	-	-	-	-	-	-	11:00	11:00
Vol.	233	225	224	200	235	215	245	205	-	-	-	-	-	-	233	211
PM Peak	17:00	17:00	17:00	17:00	17:00	17:00	16:00	17:00	-	-	-	-	-	-	17:00	17:00
Vol.	321	342	299	306	315	270	322	315	-	-	-	-	-	-	314	308

Comb. Total	6628	6383	6660	7127	0	0	0	6697

ADT ADT 6,700 AADT 6,700

County of Simcoe

Transporation and Engineering Department
Midhurst, Ontario
(705) 726-9300

County Road 22 - Fall 2014
Highway 400 to
County Road 27

Site Code: 022 05

Date Start: 06-Oct-14
Date End: 09-Oct-14

Start	06-Oct-14		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	27	18	13	21	10	31	10	20	*	*	*	*	*	*	15	22
01:00	4	11	6	6	2	29	5	7	*	*	*	*	*	*	4	13
02:00	4	2	2	4	5	9	5	6	*	*	*	*	*	*	4	5
03:00	6	7	2	7	3	10	12	6	*	*	*	*	*	*	6	8
04:00	10	9	6	2	6	7	7	5	*	*	*	*	*	*	7	6
05:00	36	16	21	14	26	11	31	11	*	*	*	*	*	*	28	13
06:00	82	51	71	49	79	47	72	50	*	*	*	*	*	*	76	49
07:00	152	93	144	105	162	108	175	101	*	*	*	*	*	*	158	102
08:00	**241**	135	**268**	159	**256**	170	**258**	162	*	*	*	*	*	*	**256**	156
09:00	215	**180**	219	174	218	**183**	230	164	*	*	*	*	*	*	220	175
10:00	200	165	185	134	188	157	221	172	*	*	*	*	*	*	198	157
11:00	186	170	148	**189**	199	183	241	**184**	*	*	*	*	*	*	194	**182**
12:00 PM	172	167	183	174	232	200	287	185	*	*	*	*	*	*	218	182
01:00	223	191	186	175	173	200	270	198	*	*	*	*	*	*	213	191
02:00	201	154	181	147	205	181	240	235	*	*	*	*	*	*	207	179
03:00	189	202	204	204	232	175	264	240	*	*	*	*	*	*	222	205
04:00	223	234	231	232	247	235	293	309	*	*	*	*	*	*	248	252
05:00	**237**	**280**	**276**	**303**	**264**	**302**	**316**	**310**	*	*	*	*	*	*	**273**	**299**
06:00	215	204	259	223	225	242	307	250	*	*	*	*	*	*	252	230
07:00	129	146	165	147	142	137	187	195	*	*	*	*	*	*	156	156
08:00	86	74	117	76	85	113	114	108	*	*	*	*	*	*	100	93
09:00	46	60	59	59	81	57	101	82	*	*	*	*	*	*	72	64
10:00	53	29	46	35	53	36	63	70	*	*	*	*	*	*	54	42
11:00	15	20	26	29	32	23	32	24	*	*	*	*	*	*	26	24
Lane	2952	2618	3018	2668	3125	2846	3741	3094	0	0	0	0	0	0	3207	2805
Day	5570		5686		5971		6835		0		0		0		6012	
AM Peak	08:00	09:00	08:00	11:00	08:00	09:00	08:00	11:00	-	-	-	-	-	-	08:00	11:00
Vol.	241	180	268	189	256	183	258	184	-	-	-	-	-	-	256	182
PM Peak	17:00	17:00	17:00	17:00	17:00	17:00	17:00	17:00	-	-	-	-	-	-	17:00	17:00
Vol.	237	280	276	303	264	302	316	310	-	-	-	-	-	-	273	299

Comb. Total	5570	5686	5971	6835	0	0	0	6012

ADT ADT 6,016 AADT 6,016

APPENDIX B

Level of Service Definitions

MMM GROUP

LEVEL OF SERVICE DEFINITIONS AT SIGNALIZED INTERSECTIONS[1]

Level of service for signalized intersections is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. Specifically, level-of-service (LOS) criteria are stated in terms of the average control delay per vehicle, typically for a 15-min analysis period. The criteria are given in the table below. Delay may be measured in the field or estimated using software such as Highway Capacity Software. Delay is a complex measure and is dependent upon a number of variables, including quality of progression, the cycle length, the green ratio, and the *v/c* ratio for the lane group in question.

Level of Service	Features	Control Delay per vehicle (sec)
A	LOS A describes operations with very low delay, up to 10 sec per vehicle. This level of service occurs when progression is extremely favourable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	≤ 10
B	LOS B describes operations with delay greater than 10 and up to 20 sec per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.	> 10 and ≤ 20
C	LOS C describes operations with delay greater than 20 and up to 35 sec per vehicle. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.	> 20 and ≤ 35
D	LOS D describes operations with delay greater than 35 and up to 55 sec per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavourable progression, long cycle lengths, of high *v/c* ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	> 35 and ≤ 55
E	LOS E describes operations with delay greater than 55 and up to 80 sec per vehicle. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high *v/c* ratios. Individual cycle failures are frequent occurrences.	> 55 and ≤ 80
F	LOS F describes operations with delay in excess of 80 sec per vehicle. This level, considered to be unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high *v/c* ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.	> 80

(1) Highway Capacity Manual 2000

LEVEL OF SERVICE DEFINITIONS AT UNSIGNALIZED INTERSECTIONS[1]

The level of service criteria for unsignalized intersections are given in the table below. As used here, total delay is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line; this time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position. The average total delay for any particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation.

Level of Service	Features	Average Total Delay (sec/veh)
A	Little or no traffic delay occurs. Approaches appear open, turning movements are easily made, and drivers have freedom of operation.	≤ 10
B	Short traffic delays occur. Many drivers begin to feel somewhat restricted in terms of freedom of operation.	> 10 and ≤ 15
C	Average traffic delays occur. Operations are generally stable, but drivers emerging from the minor street may experience difficulty in completing their movement. This may occasionally impact on the stability of flow on the major street.	> 15 and ≤ 25
D	Long traffic delays occur. Motorists emerging from the minor street experience significant restriction and frustration. Drivers on the major street will experience congestion and delay as drivers emerging from the minor street interfere with the major through movements.	> 25 and ≤ 35
E	Very long traffic delays occur. Operations approach the capacity of the intersection.	> 35 and ≤ 50
F	Saturation occurs, with vehicle demand exceeding the available capacity. Very long traffic delays occur.	> 50

(1) Highway Capacity Manual 2000.

J:\Capacity Appendix\Unsignalized\hcs unsignalized_delay.doc

APPENDIX C

Existing Intersection Capacity Analysis

MMM GROUP

Lanes, Volumes, Timings
1: County Road 27 & County Road 22

06/11/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	135	16	44	174	66	23	353	58	49	287	36
Future Volume (vph)	38	135	16	44	174	66	23	353	58	49	287	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	110.0		0.0	0.0		0.0	130.0		0.0	125.0		110.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			0.0			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.984			0.969			0.979				0.850
Flt Protected	0.950				0.992		0.950			0.950		
Satd. Flow (prot)	1767	1747	0	0	1711	0	1700	3495	0	1668	1842	1597
Flt Permitted	0.530				0.927		0.558			0.500		
Satd. Flow (perm)	986	1747	0	0	1599	0	998	3495	0	878	1842	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8			20			29				53
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		515.9			1538.1			209.3			305.4	
Travel Time (s)		23.2			69.2			9.4			13.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	5%	13%	8%	7%	0%	5%	0%	0%	7%	2%	0%
Adj. Flow (vph)	40	142	17	46	183	69	24	372	61	52	302	38
Shared Lane Traffic (%)												
Lane Group Flow (vph)	40	159	0	0	298	0	24	433	0	52	302	38
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		4
Minimum Split (s)	17.1	17.1		17.1	17.1		27.8	27.8		27.8	27.8	27.8
Total Split (s)	37.1	37.1		37.1	37.1		47.8	47.8		47.8	47.8	47.8
Total Split (%)	43.7%	43.7%		43.7%	43.7%		56.3%	56.3%		56.3%	56.3%	56.3%
Maximum Green (s)	30.0	30.0		30.0	30.0		40.0	40.0		40.0	40.0	40.0
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.2	1.2		1.2	1.2		1.9	1.9		1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1			7.1		7.8	7.8		7.8	7.8	7.8
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)	30.0	30.0			30.0		40.0	40.0		40.0	40.0	40.0
Actuated g/C Ratio	0.35	0.35			0.35		0.47	0.47		0.47	0.47	0.47
v/c Ratio	0.11	0.26			0.52		0.05	0.26		0.13	0.35	0.05
Control Delay	19.7	19.9			24.0		12.7	13.1		13.7	15.7	2.6
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0

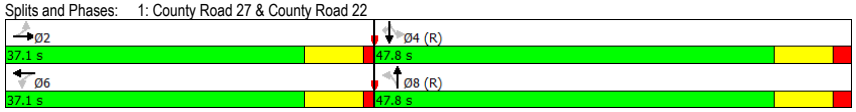
Lanes, Volumes, Timings
1: County Road 27 & County Road 22

06/11/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	19.7	19.9			24.0		12.7	13.1		13.7	15.7	2.6
LOS	B	B			C		B	B		B	B	A
Approach Delay		19.8			24.0			13.0			14.1	
Approach LOS		B			C			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 84.9			
Actuated Cycle Length: 84.9			
Offset: 7.8 (9%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.52			
Intersection Signal Delay: 16.8		Intersection LOS: B	
Intersection Capacity Utilization 82.1%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: County Road 27 & County Road 22



Queues
1: County Road 27 & County Road 22

06/11/2016

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	40	159	298	24	433	52	302	38
v/c Ratio	0.11	0.26	0.52	0.05	0.26	0.13	0.35	0.05
Control Delay	19.7	19.9	24.0	12.7	13.1	13.7	15.7	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.7	19.9	24.0	12.7	13.1	13.7	15.7	2.6
Queue Length 50th (m)	4.5	18.0	36.8	2.1	20.8	4.8	31.3	0.0
Queue Length 95th (m)	11.7	32.8	61.6	6.3	30.4	11.6	49.9	3.6
Internal Link Dist (m)		491.9	1514.1		185.3		281.4	
Turn Bay Length (m)	110.0			130.0		125.0		110.0
Base Capacity (vph)	348	622	577	470	1661	413	867	780
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.26	0.52	0.05	0.26	0.13	0.35	0.05

Intersection Summary

Lanes, Volumes, Timings
2: Gill Road & County Road 22

06/11/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	237	8	11	259	16	7	2	7	13	3	3
Future Volume (vph)	10	237	8	11	259	16	7	2	7	13	3	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.9	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.992			0.941			0.980	
Flt Protected		0.998			0.998			0.979			0.966	
Satd. Flow (prot)	0	1814	0	0	1780	0	0	1614	0	0	1707	0
Flt Permitted		0.998			0.998			0.979			0.966	
Satd. Flow (perm)	0	1814	0	0	1780	0	0	1614	0	0	1707	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		1538.1			1226.0			296.2			94.4	
Travel Time (s)		69.2			55.2			17.8			6.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	5%	0%	5%	0%	0%	0%	0%	6%	0%	0%
Adj. Flow (vph)	11	249	8	12	273	17	7	2	7	14	3	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	268	0	0	302	0	0	16	0	0	20	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.11	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 28.8% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
2: Gill Road & County Road 22

06/11/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	237	8	11	259	16	7	2	7	13	3	3
Future Volume (Veh/h)	10	237	8	11	259	16	7	2	7	13	3	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	249	8	12	273	17	7	2	7	14	3	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	290			257			585	589	253	588	584	282
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	290			257			585	589	253	588	584	282
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	99			99			98	100	99	97	99	100
cM capacity (veh/h)	1283			1320			416	416	791	404	418	762

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	268	302	16	20
Volume Left	11	12	7	14
Volume Right	8	17	7	3
cSH	1283	1320	525	437
Volume to Capacity	0.01	0.01	0.03	0.05
Queue Length 95th (m)	0.2	0.2	0.8	1.1
Control Delay (s)	0.4	0.4	12.1	13.6
Lane LOS	A	A	B	B
Approach Delay (s)	0.4	0.4	12.1	13.6
Approach LOS			B	B

Intersection Summary					
Average Delay	1.1				
Intersection Capacity Utilization	28.8%	ICU Level of Service		A	
Analysis Period (min)	15				

Lanes, Volumes, Timings
3: Fox Farm Road & County Road 22/Country Road 22

06/11/2016

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	249	5	6	272	4	4
Future Volume (vph)	249	5	6	272	4	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.997				0.932	
Flt Protected				0.999	0.976	
Satd. Flow (prot)	1820	0	0	1802	1709	0
Flt Permitted				0.999	0.976	
Satd. Flow (perm)	1820	0	0	1802	1709	0
Link Speed (k/h)	80			50	80	
Link Distance (m)	153.6			1063.4	320.8	
Travel Time (s)	6.9			76.6	14.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	0%	12%	4%	0%	0%
Adj. Flow (vph)	262	5	6	286	4	4
Shared Lane Traffic (%)						
Lane Group Flow (vph)	267	0	0	292	8	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 29.1%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
3: Fox Farm Road & County Road 22/Country Road 22

06/11/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	249	5	6	272	4	4
Future Volume (Veh/h)	249	5	6	272	4	4
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	262	5	6	286	4	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			267		562	264
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			267		562	264
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1241		489	779

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	267	292	8
Volume Left	0	6	4
Volume Right	5	0	4
cSH	1700	1241	601
Volume to Capacity	0.16	0.00	0.01
Queue Length 95th (m)	0.0	0.1	0.3
Control Delay (s)	0.0	0.2	11.1
Lane LOS		A	B
Approach Delay (s)	0.0	0.2	11.1
Approach LOS			B

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		29.1%	ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings
4: Old Second Road

06/11/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	247	7	5	276	14	6	8	8	7	5	3
Future Volume (vph)	3	247	7	5	276	14	6	8	8	7	5	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.993			0.951			0.973	
Flt Protected		0.999			0.999			0.987			0.977	
Satd. Flow (prot)	0	1777	0	0	1792	0	0	1677	0	0	1634	0
Flt Permitted		0.999			0.999			0.987			0.977	
Satd. Flow (perm)	0	1777	0	0	1792	0	0	1677	0	0	1634	0
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		1063.4			661.0			398.3			389.2	
Travel Time (s)		76.6			47.6			17.9			17.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	5%	16%	16%	4%	0%	7%	0%	9%	20%	0%	0%
Adj. Flow (vph)	3	260	7	5	291	15	6	8	8	7	5	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	270	0	0	311	0	0	22	0	0	15	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 28.4%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
4: Old Second Road

06/11/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	247	7	5	276	14	6	8	8	7	5	3
Future Volume (Veh/h)	3	247	7	5	276	14	6	8	8	7	5	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	3	260	7	5	291	15	6	8	8	7	5	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	306			267			584	586	264	590	582	298
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	306			267			584	586	264	590	582	298
tC, single (s)	4.1			4.3			7.2	6.5	6.3	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.4	3.7	4.0	3.3
p0 queue free %	100			100			99	98	99	98	99	100
cM capacity (veh/h)	1266			1220			409	423	758	382	425	746

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	270	311	22	15
Volume Left	3	5	6	7
Volume Right	7	15	8	3
cSH	1266	1220	498	440
Volume to Capacity	0.00	0.00	0.04	0.03
Queue Length 95th (m)	0.1	0.1	1.1	0.8
Control Delay (s)	0.1	0.2	12.6	13.5
Lane LOS	A	A	B	B
Approach Delay (s)	0.1	0.2	12.6	13.5
Approach LOS			B	B

Intersection Summary				
Average Delay	0.9			
Intersection Capacity Utilization	28.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Lanes, Volumes, Timings
5: Country Road 22 & Highway 400 South Ramp

06/11/2016

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	56	207	225	109	2	77
Future Volume (vph)	56	207	225	109	2	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.868	
Flt Protected		0.989			0.999	
Satd. Flow (prot)	0	1776	1824	1581	1604	0
Flt Permitted		0.989			0.999	
Satd. Flow (perm)	0	1776	1824	1581	1604	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		661.0	382.0		499.1	
Travel Time (s)		47.6	27.5		35.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	4%	3%	1%	25%	1%
Adj. Flow (vph)	59	218	237	115	2	81
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	277	237	115	83	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 40.7%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
5: Country Road 22 & Highway 400 South Ramp

06/11/2016

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	56	207	225	109	2	77
Future Volume (Veh/h)	56	207	225	109	2	77
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	59	218	237	115	2	81
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	237				573	237
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	237				573	237
tC, single (s)	4.2				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.7	3.3
p0 queue free %	95				100	90
cM capacity (veh/h)	1301				424	804

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	277	237	115	83
Volume Left	59	0	0	2
Volume Right	0	0	115	81
cSH	1301	1700	1700	787
Volume to Capacity	0.05	0.14	0.07	0.11
Queue Length 95th (m)	1.1	0.0	0.0	2.8
Control Delay (s)	2.0	0.0	0.0	10.1
Lane LOS	A			B
Approach Delay (s)	2.0	0.0		10.1
Approach LOS				B

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	40.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
6: Highway 400 North Ramp & County Road 22

06/11/2016

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	161	54	8	294	49	93
Future Volume (vph)	161	54	8	294	49	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.999	0.950	
Satd. Flow (prot)	1824	1581	0	1804	1785	1566
Flt Permitted				0.999	0.950	
Satd. Flow (perm)	1824	1581	0	1804	1785	1566
Link Speed (k/h)	50			80	50	
Link Distance (m)	382.0			36.2	392.3	
Travel Time (s)	27.5			1.6	28.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	1%	5%	4%	0%	2%
Adj. Flow (vph)	169	57	8	309	52	98
Shared Lane Traffic (%)						
Lane Group Flow (vph)	169	57	0	317	52	98
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	31.9%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6: Highway 400 North Ramp & County Road 22

06/11/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	161	54	8	294	49	93
Future Volume (Veh/h)	161	54	8	294	49	93
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	169	57	8	309	52	98
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			169		494	169
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			169		494	169
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		90	89
cM capacity (veh/h)			1390		535	875

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2
Volume Total	169	57	317	52	98
Volume Left	0	0	8	52	0
Volume Right	0	57	0	0	98
cSH	1700	1700	1390	535	875
Volume to Capacity	0.10	0.03	0.01	0.10	0.11
Queue Length 95th (m)	0.0	0.0	0.1	2.6	3.0
Control Delay (s)	0.0	0.0	0.2	12.5	9.6
Lane LOS			A	B	A
Approach Delay (s)	0.0		0.2	10.6	
Approach LOS				B	

Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	31.9%	ICU Level of Service		A
Analysis Period (min)	15			

Lanes, Volumes, Timings
7: County Road 93 & County Road 22

06/11/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	208	44	20	238	29	70	62	19	29	43	22
Future Volume (vph)	27	208	44	20	238	29	70	62	19	29	43	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	180.0		0.0	185.0		0.0	157.0		0.0	150.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.974			0.984			0.965			0.949	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	1800	0	1733	1776	0	1623	1759	0	1785	1704	0
Flt Permitted	0.566			0.587			0.713			0.702		
Satd. Flow (perm)	1053	1800	0	1071	1776	0	1218	1759	0	1319	1704	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		20			12			20			23	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1121.3			305.8			269.5			271.6	
Travel Time (s)		80.7			22.0			19.4			19.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	2%	0%	3%	4%	5%	10%	4%	0%	0%	7%	0%
Adj. Flow (vph)	28	219	46	21	251	31	74	65	20	31	45	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	265	0	21	282	0	74	85	0	31	68	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	24.0	24.0		24.0	24.0		26.0	26.0		26.0	26.0	
Total Split (s)	31.0	31.0		31.0	31.0		31.0	31.0		31.0	31.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	13.0	13.0		13.0	13.0		15.0	15.0		15.0	15.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Actuated g/C Ratio	0.40	0.40		0.40	0.40		0.40	0.40		0.40	0.40	

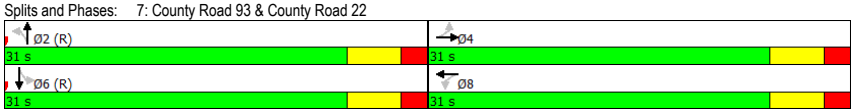
Lanes, Volumes, Timings
7: County Road 93 & County Road 22

06/11/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.07	0.36		0.05	0.39		0.15	0.12		0.06	0.10	
Control Delay	12.0	13.6		11.8	14.5		12.8	10.0		11.8	8.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	12.0	13.6		11.8	14.5		12.8	10.0		11.8	8.9	
LOS	B	B		B	B		B	A		B	A	
Approach Delay		13.5			14.3			11.3			9.8	
Approach LOS		B			B			B			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 62			
Actuated Cycle Length: 62			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.39			
Intersection Signal Delay: 12.9		Intersection LOS: B	
Intersection Capacity Utilization 49.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 7: County Road 93 & County Road 22



Queues
7: County Road 93 & County Road 22

06/11/2016

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	28	265	21	282	74	85	31	68
v/c Ratio	0.07	0.36	0.05	0.39	0.15	0.12	0.06	0.10
Control Delay	12.0	13.6	11.8	14.5	12.8	10.0	11.8	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.0	13.6	11.8	14.5	12.8	10.0	11.8	8.9
Queue Length 50th (m)	2.0	19.6	1.5	21.9	5.4	4.7	2.2	3.2
Queue Length 95th (m)	6.4	35.8	5.2	39.3	13.1	12.2	6.8	9.8
Internal Link Dist (m)		1097.3		281.8		245.5		247.6
Turn Bay Length (m)	180.0		185.0		157.0		150.0	
Base Capacity (vph)	424	737	431	723	491	721	531	700
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.36	0.05	0.39	0.15	0.12	0.06	0.10

Intersection Summary

Lanes, Volumes, Timings
1: County Road 27 & County Road 22

06/11/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	226	22	45	202	87	17	447	99	65	331	30
Future Volume (vph)	51	226	22	45	202	87	17	447	99	65	331	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	110.0		0.0	0.0		0.0	130.0		0.0	125.0		110.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			0.0			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.987			0.965			0.973				0.850
Flt Protected	0.950				0.993		0.950			0.950		
Satd. Flow (prot)	1767	1754	0	0	1710	0	1700	3474	0	1668	1842	1597
Flt Permitted	0.477				0.918		0.511			0.422		
Satd. Flow (perm)	887	1754	0	0	1581	0	914	3474	0	741	1842	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			23			42				53
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		515.9			1538.1			209.3			305.4	
Travel Time (s)		23.2			69.2			9.4			13.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	5%	13%	8%	7%	0%	5%	0%	0%	7%	2%	0%
Adj. Flow (vph)	54	238	23	47	213	92	18	471	104	68	348	32
Shared Lane Traffic (%)												
Lane Group Flow (vph)	54	261	0	0	352	0	18	575	0	68	348	32
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		4
Minimum Split (s)	27.8	27.8		27.8	27.8		17.8	17.8		17.8	17.8	17.8
Total Split (s)	37.1	37.1		37.1	37.1		47.8	47.8		47.8	47.8	47.8
Total Split (%)	43.7%	43.7%		43.7%	43.7%		56.3%	56.3%		56.3%	56.3%	56.3%
Maximum Green (s)	30.0	30.0		30.0	30.0		40.0	40.0		40.0	40.0	40.0
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.2	1.2		1.2	1.2		1.9	1.9		1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1			7.1		7.8	7.8		7.8	7.8	7.8
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)	30.0	30.0			30.0		40.0	40.0		40.0	40.0	40.0
Actuated g/C Ratio	0.35	0.35			0.35		0.47	0.47		0.47	0.47	0.47
v/c Ratio	0.17	0.42			0.61		0.04	0.35		0.19	0.40	0.04
Control Delay	20.8	22.9			26.6		12.6	13.8		15.0	16.4	1.9
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0

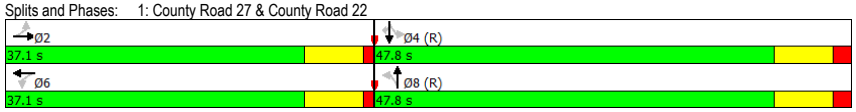
Lanes, Volumes, Timings
1: County Road 27 & County Road 22

06/11/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	20.8	22.9			26.6		12.6	13.8		15.0	16.4	1.9
LOS	C	C			C		B	B		B	B	A
Approach Delay		22.5			26.6			13.7			15.2	
Approach LOS		C			C			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 84.9			
Actuated Cycle Length: 84.9			
Offset: 47.8 (56%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 18.4		Intersection LOS: B	
Intersection Capacity Utilization 85.7%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: County Road 27 & County Road 22



Queues
1: County Road 27 & County Road 22

06/11/2016

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	54	261	352	18	575	68	348	32
v/c Ratio	0.17	0.42	0.61	0.04	0.35	0.19	0.40	0.04
Control Delay	20.8	22.9	26.6	12.6	13.8	15.0	16.4	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.8	22.9	26.6	12.6	13.8	15.0	16.4	1.9
Queue Length 50th (m)	6.3	32.5	45.6	1.6	28.6	6.5	37.1	0.0
Queue Length 95th (m)	15.1	53.8	75.0	5.3	40.6	14.9	58.2	2.7
Internal Link Dist (m)		491.9	1514.1		185.3		281.4	
Turn Bay Length (m)	110.0			130.0		125.0		110.0
Base Capacity (vph)	313	623	573	430	1658	349	867	780
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.42	0.61	0.04	0.35	0.19	0.40	0.04

Intersection Summary

Lanes, Volumes, Timings
2: Gill Road & County Road 22

06/11/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	377	18	14	324	10	11	3	9	15	0	12
Future Volume (vph)	13	377	18	14	324	10	11	3	9	15	0	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.9	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.994			0.996			0.949			0.939	
Flt Protected		0.998			0.998			0.976			0.973	
Satd. Flow (prot)	0	1810	0	0	1785	0	0	1623	0	0	1662	0
Flt Permitted		0.998			0.998			0.976			0.973	
Satd. Flow (perm)	0	1810	0	0	1785	0	0	1623	0	0	1662	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		1538.1			1226.0			296.2			94.4	
Travel Time (s)		69.2			55.2			17.8			6.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	5%	0%	5%	0%	0%	0%	0%	6%	0%	0%
Adj. Flow (vph)	14	397	19	15	341	11	12	3	9	16	0	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	430	0	0	367	0	0	24	0	0	29	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.11	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 35.8% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
2: Gill Road & County Road 22

06/11/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	377	18	14	324	10	11	3	9	15	0	12
Future Volume (Veh/h)	13	377	18	14	324	10	11	3	9	15	0	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	14	397	19	15	341	11	12	3	9	16	0	13
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	352			416			824	816	406	822	820	346
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	352			416			824	816	406	822	820	346
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	99			99			96	99	99	94	100	98
cM capacity (veh/h)	1218			1154			284	306	649	277	304	701

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	430	367	24	29
Volume Left	14	15	12	16
Volume Right	19	11	9	13
cSH	1218	1154	364	380
Volume to Capacity	0.01	0.01	0.07	0.08
Queue Length 95th (m)	0.3	0.3	1.7	2.0
Control Delay (s)	0.4	0.5	15.6	15.2
Lane LOS	A	A	C	C
Approach Delay (s)	0.4	0.5	15.6	15.2
Approach LOS			C	C

Intersection Summary					
Average Delay	1.4				
Intersection Capacity Utilization	35.8%	ICU Level of Service	A		
Analysis Period (min)	15				

Lanes, Volumes, Timings
3: Fox Farm Road & County Road 22/Country Road 22

06/11/2016

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	398	8	8	343	1	3
Future Volume (vph)	398	8	8	343	1	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.997				0.899	
Flt Protected				0.999	0.988	
Satd. Flow (prot)	1820	0	0	1802	1669	0
Flt Permitted				0.999	0.988	
Satd. Flow (perm)	1820	0	0	1802	1669	0
Link Speed (k/h)	80			50	80	
Link Distance (m)	153.6			1063.4	320.8	
Travel Time (s)	6.9			76.6	14.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	0%	12%	4%	0%	0%
Adj. Flow (vph)	419	8	8	361	1	3
Shared Lane Traffic (%)						
Lane Group Flow (vph)	427	0	0	369	4	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	34.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Fox Farm Road & County Road 22/Country Road 22

06/11/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	398	8	8	343	1	3
Future Volume (Veh/h)	398	8	8	343	1	3
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	419	8	8	361	1	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			427		800	423
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			427		800	423
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			1081		354	635

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	427	369	4
Volume Left	0	8	1
Volume Right	8	0	3
cSH	1700	1081	530
Volume to Capacity	0.25	0.01	0.01
Queue Length 95th (m)	0.0	0.2	0.2
Control Delay (s)	0.0	0.3	11.8
Lane LOS		A	B
Approach Delay (s)	0.0	0.3	11.8
Approach LOS			B

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		34.5%	ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings
4: Old Second Road

06/11/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	372	12	6	329	48	14	24	11	10	9	5
Future Volume (vph)	13	372	12	6	329	48	14	24	11	10	9	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.983			0.969			0.973	
Flt Protected		0.998			0.999			0.986			0.978	
Satd. Flow (prot)	0	1776	0	0	1780	0	0	1725	0	0	1643	0
Flt Permitted		0.998			0.999			0.986			0.978	
Satd. Flow (perm)	0	1776	0	0	1780	0	0	1725	0	0	1643	0
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		1063.4			661.0			398.3			389.2	
Travel Time (s)		76.6			47.6			17.9			17.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	5%	16%	16%	4%	0%	7%	0%	9%	20%	0%	0%
Adj. Flow (vph)	14	392	13	6	346	51	15	25	12	11	9	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	419	0	0	403	0	0	52	0	0	25	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 37.6%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
4: Old Second Road

06/11/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	372	12	6	329	48	14	24	11	10	9	5
Future Volume (Veh/h)	13	372	12	6	329	48	14	24	11	10	9	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	14	392	13	6	346	51	15	25	12	11	9	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	397			405			820	836	398	834	816	372
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	397			405			820	836	398	834	816	372
tC, single (s)	4.1			4.3			7.2	6.5	6.3	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.4	3.7	4.0	3.3
p0 queue free %	99			99			95	92	98	95	97	99
cM capacity (veh/h)	1173			1082			276	300	636	243	308	679

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	419	403	52	25
Volume Left	14	6	15	11
Volume Right	13	51	12	5
cSH	1173	1082	332	305
Volume to Capacity	0.01	0.01	0.16	0.08
Queue Length 95th (m)	0.3	0.1	4.4	2.1
Control Delay (s)	0.4	0.2	17.8	17.8
Lane LOS	A	A	C	C
Approach Delay (s)	0.4	0.2	17.8	17.8
Approach LOS			C	C

Intersection Summary					
Average Delay			1.8		
Intersection Capacity Utilization			37.6%	ICU Level of Service	A
Analysis Period (min)			15		

Lanes, Volumes, Timings
5: Country Road 22 & Highway 400 South Ramp

06/11/2016

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	67	326	306	110	4	81
Future Volume (vph)	67	326	306	110	4	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.871	
Flt Protected		0.991			0.998	
Satd. Flow (prot)	0	1782	1824	1581	1600	0
Flt Permitted		0.991			0.998	
Satd. Flow (perm)	0	1782	1824	1581	1600	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		661.0	382.0		499.1	
Travel Time (s)		47.6	27.5		35.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	4%	3%	1%	25%	1%
Adj. Flow (vph)	71	343	322	116	4	85
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	414	322	116	89	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 52.2%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
5: Country Road 22 & Highway 400 South Ramp

06/11/2016

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	67	326	306	110	4	81
Future Volume (Veh/h)	67	326	306	110	4	81
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	71	343	322	116	4	85
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	322				807	322
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	322				807	322
tC, single (s)	4.2				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.7	3.3
p0 queue free %	94				99	88
cM capacity (veh/h)	1210				302	721

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	414	322	116	89
Volume Left	71	0	0	4
Volume Right	0	0	116	85
cSH	1210	1700	1700	679
Volume to Capacity	0.06	0.19	0.07	0.13
Queue Length 95th (m)	1.5	0.0	0.0	3.6
Control Delay (s)	1.9	0.0	0.0	11.1
Lane LOS	A			B
Approach Delay (s)	1.9	0.0		11.1
Approach LOS				B

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	52.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
6: Highway 400 North Ramp & County Road 22

06/11/2016

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	239	92	17	306	107	178
Future Volume (vph)	239	92	17	306	107	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.997	0.950	
Satd. Flow (prot)	1824	1581	0	1800	1785	1566
Flt Permitted				0.997	0.950	
Satd. Flow (perm)	1824	1581	0	1800	1785	1566
Link Speed (k/h)	50			80	50	
Link Distance (m)	382.0			36.2	392.3	
Travel Time (s)	27.5			1.6	28.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	1%	5%	4%	0%	2%
Adj. Flow (vph)	252	97	18	322	113	187
Shared Lane Traffic (%)						
Lane Group Flow (vph)	252	97	0	340	113	187
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	42.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6: Highway 400 North Ramp & County Road 22

06/11/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	239	92	17	306	107	178
Future Volume (Veh/h)	239	92	17	306	107	178
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	252	97	18	322	113	187
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			252		610	252
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			252		610	252
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		75	76
cM capacity (veh/h)			1296		455	787

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2
Volume Total	252	97	340	113	187
Volume Left	0	0	18	113	0
Volume Right	0	97	0	0	187
cSH	1700	1700	1296	455	787
Volume to Capacity	0.15	0.06	0.01	0.25	0.24
Queue Length 95th (m)	0.0	0.0	0.3	7.8	7.4
Control Delay (s)	0.0	0.0	0.5	15.5	11.0
Lane LOS			A	C	B
Approach Delay (s)	0.0		0.5	12.7	
Approach LOS				B	

Intersection Summary				
Average Delay	4.0			
Intersection Capacity Utilization	42.6%	ICU Level of Service		A
Analysis Period (min)	15			

Lanes, Volumes, Timings
7: County Road 93 & County Road 22

06/11/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	314	69	26	249	54	29	94	75	34	70	40
Future Volume (vph)	64	314	69	26	249	54	29	94	75	34	70	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	180.0		0.0	185.0		0.0	157.0		0.0	150.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.973			0.973			0.933			0.946	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	1799	0	1733	1755	0	1623	1715	0	1785	1701	0
Flt Permitted	0.522			0.426			0.682			0.645		
Satd. Flow (perm)	971	1799	0	777	1755	0	1165	1715	0	1212	1701	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		21			21			78			42	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1121.3			305.8			269.5			271.6	
Travel Time (s)		80.7			22.0			19.4			19.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	2%	0%	3%	4%	5%	10%	4%	0%	0%	7%	0%
Adj. Flow (vph)	67	331	73	27	262	57	31	99	79	36	74	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	404	0	27	319	0	31	178	0	36	116	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	24.0	24.0		24.0	24.0		26.0	26.0		26.0	26.0	
Total Split (s)	31.0	31.0		31.0	31.0		31.0	31.0		31.0	31.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	13.0	13.0		13.0	13.0		15.0	15.0		15.0	15.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Actuated g/C Ratio	0.40	0.40		0.40	0.40		0.40	0.40		0.40	0.40	

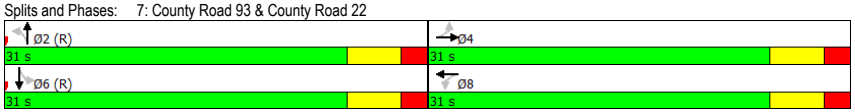
Lanes, Volumes, Timings
7: County Road 93 & County Road 22

06/11/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.17	0.55		0.09	0.44		0.07	0.24		0.07	0.16	
Control Delay	13.4	16.8		12.5	14.9		11.9	8.1		12.0	8.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	13.4	16.8		12.5	14.9		11.9	8.1		12.0	8.8	
LOS	B	B		B	B		B	A		B	A	
Approach Delay		16.3			14.7			8.7			9.5	
Approach LOS		B			B			A			A	

Intersection Summary			
Area Type:	Other		
Cycle Length: 62			
Actuated Cycle Length: 62			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.55			
Intersection Signal Delay: 13.6		Intersection LOS: B	
Intersection Capacity Utilization 79.0%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 7: County Road 93 & County Road 22



Queues
7: County Road 93 & County Road 22

06/11/2016

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	67	404	27	319	31	178	36	116
v/c Ratio	0.17	0.55	0.09	0.44	0.07	0.24	0.07	0.16
Control Delay	13.4	16.8	12.5	14.9	11.9	8.1	12.0	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.4	16.8	12.5	14.9	11.9	8.1	12.0	8.8
Queue Length 50th (m)	5.0	33.7	1.9	24.8	2.2	7.3	2.6	5.3
Queue Length 95th (m)	12.5	58.0	6.4	44.3	6.8	18.6	7.5	14.2
Internal Link Dist (m)		1097.3		281.8		245.5		247.6
Turn Bay Length (m)	180.0		185.0		157.0		150.0	
Base Capacity (vph)	391	737	313	720	469	738	488	710
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.55	0.09	0.44	0.07	0.24	0.07	0.16

Intersection Summary

Lanes, Volumes, Timings
1: County Road 27 & County Road 22

06/11/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	361	15	33	212	74	27	520	110	64	253	63
Future Volume (vph)	52	361	15	33	212	74	27	520	110	64	253	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	110.0		0.0	0.0		0.0	130.0		0.0	125.0		110.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			0.0			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.994			0.969			0.974				0.850
Flt Protected	0.950				0.995		0.950			0.950		
Satd. Flow (prot)	1767	1773	0	0	1717	0	1700	3477	0	1668	1842	1597
Flt Permitted	0.488				0.878		0.595			0.370		
Satd. Flow (perm)	908	1773	0	0	1515	0	1065	3477	0	650	1842	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			20			40				66
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		515.9			1538.1			209.3			305.4	
Travel Time (s)		23.2			69.2			9.4			13.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	5%	13%	8%	7%	0%	5%	0%	0%	7%	2%	0%
Adj. Flow (vph)	55	380	16	35	223	78	28	547	116	67	266	66
Shared Lane Traffic (%)												
Lane Group Flow (vph)	55	396	0	0	336	0	28	663	0	67	266	66
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		4
Minimum Split (s)	27.8	27.8		27.8	27.8		17.8	17.8		17.8	17.8	17.8
Total Split (s)	37.1	37.1		37.1	37.1		47.8	47.8		47.8	47.8	47.8
Total Split (%)	43.7%	43.7%		43.7%	43.7%		56.3%	56.3%		56.3%	56.3%	56.3%
Maximum Green (s)	30.0	30.0		30.0	30.0		40.0	40.0		40.0	40.0	40.0
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.2	1.2		1.2	1.2		1.9	1.9		1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1			7.1		7.8	7.8		7.8	7.8	7.8
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)	30.0	30.0			30.0		40.0	40.0		40.0	40.0	40.0
Actuated g/C Ratio	0.35	0.35			0.35		0.47	0.47		0.47	0.47	0.47
v/c Ratio	0.17	0.63			0.61		0.06	0.40		0.22	0.31	0.08
Control Delay	20.8	28.1			27.0		12.7	14.5		15.7	15.1	3.8
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0

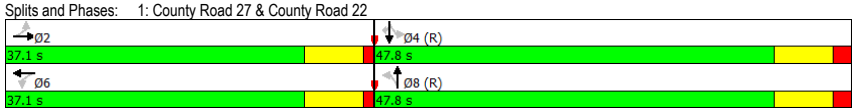
Lanes, Volumes, Timings
1: County Road 27 & County Road 22

06/11/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	20.8	28.1			27.0		12.7	14.5		15.7	15.1	3.8
LOS	C	C			C		B	B		B	B	A
Approach Delay		27.2			27.0			14.5			13.3	
Approach LOS		C			C			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 84.9			
Actuated Cycle Length: 84.9			
Offset: 47.8 (56%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.63			
Intersection Signal Delay: 19.5		Intersection LOS: B	
Intersection Capacity Utilization 88.4%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: County Road 27 & County Road 22



Queues
1: County Road 27 & County Road 22

06/11/2016

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	55	396	336	28	663	67	266	66
v/c Ratio	0.17	0.63	0.61	0.06	0.40	0.22	0.31	0.08
Control Delay	20.8	28.1	27.0	12.7	14.5	15.7	15.1	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.8	28.1	27.0	12.7	14.5	15.7	15.1	3.8
Queue Length 50th (m)	6.4	55.0	43.8	2.5	34.6	6.5	26.9	0.0
Queue Length 95th (m)	15.2	85.8	72.7	7.2	48.0	15.5	43.8	6.5
Internal Link Dist (m)		491.9	1514.1		185.3		281.4	
Turn Bay Length (m)	110.0			130.0		125.0		110.0
Base Capacity (vph)	320	628	548	501	1659	306	867	787
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.63	0.61	0.06	0.40	0.22	0.31	0.08

Intersection Summary

Lanes, Volumes, Timings
2: Gill Road & County Road 22

06/11/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	543	10	10	359	17	3	2	2	18	1	18
Future Volume (vph)	21	543	10	10	359	17	3	2	2	18	1	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.9	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.994			0.961			0.934	
Flt Protected		0.998			0.999			0.979			0.976	
Satd. Flow (prot)	0	1818	0	0	1783	0	0	1649	0	0	1664	0
Flt Permitted		0.998			0.999			0.979			0.976	
Satd. Flow (perm)	0	1818	0	0	1783	0	0	1649	0	0	1664	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		1538.1			370.7			296.2			94.4	
Travel Time (s)		69.2			16.7			17.8			6.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	5%	0%	5%	0%	0%	0%	0%	6%	0%	0%
Adj. Flow (vph)	22	572	11	11	378	18	3	2	2	19	1	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	605	0	0	407	0	0	7	0	0	39	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.11	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 48.9% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
2: Gill Road & County Road 22

06/11/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	543	10	10	359	17	3	2	2	18	1	18
Future Volume (Veh/h)	21	543	10	10	359	17	3	2	2	18	1	18
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	22	572	11	11	378	18	3	2	2	19	1	19
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	396			583			1050	1040	578	1034	1036	387
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	396			583			1050	1040	578	1034	1036	387
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	98			99			98	99	100	91	100	97
cM capacity (veh/h)	1174			1001			196	225	520	200	227	665

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	605	407	7	39
Volume Left	22	11	3	19
Volume Right	11	18	2	19
cSH	1174	1001	250	305
Volume to Capacity	0.02	0.01	0.03	0.13
Queue Length 95th (m)	0.5	0.3	0.7	3.5
Control Delay (s)	0.5	0.4	19.8	18.5
Lane LOS	A	A	C	C
Approach Delay (s)	0.5	0.4	19.8	18.5
Approach LOS			C	C

Intersection Summary					
Average Delay			1.2		
Intersection Capacity Utilization			48.9%	ICU Level of Service	A
Analysis Period (min)			15		

Lanes, Volumes, Timings
3: Fox Farm Road & County Road 22/Country Road 22

06/11/2016

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	578	5	6	386	3	7
Future Volume (vph)	578	5	6	386	3	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999				0.905	
Flt Protected				0.999	0.985	
Satd. Flow (prot)	1823	0	0	1803	1675	0
Flt Permitted				0.999	0.985	
Satd. Flow (perm)	1823	0	0	1803	1675	0
Link Speed (k/h)	80			50	80	
Link Distance (m)	153.6			1063.4	320.8	
Travel Time (s)	6.9			76.6	14.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	0%	12%	4%	0%	0%
Adj. Flow (vph)	608	5	6	406	3	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	613	0	0	412	10	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary				
Area Type:	Other			
Control Type: Unsignalized				
Intersection Capacity Utilization 40.7%			ICU Level of Service A	
Analysis Period (min) 15				

HCM Unsignalized Intersection Capacity Analysis
3: Fox Farm Road & County Road 22/Country Road 22

06/11/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	578	5	6	386	3	7
Future Volume (Veh/h)	578	5	6	386	3	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	608	5	6	406	3	7
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			613		1028	610
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			613		1028	610
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			99		99	99
cM capacity (veh/h)			919		260	498

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	613	412	10
Volume Left	0	6	3
Volume Right	5	0	7
cSH	1700	919	390
Volume to Capacity	0.36	0.01	0.03
Queue Length 95th (m)	0.0	0.2	0.6
Control Delay (s)	0.0	0.2	14.5
Lane LOS		A	B
Approach Delay (s)	0.0	0.2	14.5
Approach LOS			B

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	40.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
4: Old Second Road

06/11/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	575	8	7	373	23	5	16	9	14	5	6
Future Volume (vph)	4	575	8	7	373	23	5	16	9	14	5	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.992			0.961			0.969	
Flt Protected					0.999			0.992			0.972	
Satd. Flow (prot)	0	1784	0	0	1791	0	0	1727	0	0	1587	0
Flt Permitted					0.999			0.992			0.972	
Satd. Flow (perm)	0	1784	0	0	1791	0	0	1727	0	0	1587	0
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		1063.4			661.0			398.3			389.2	
Travel Time (s)		76.6			47.6			17.9			17.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	5%	16%	16%	4%	0%	7%	0%	9%	20%	0%	0%
Adj. Flow (vph)	4	605	8	7	393	24	5	17	9	15	5	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	617	0	0	424	0	0	31	0	0	26	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
4: Old Second Road

06/11/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	575	8	7	373	23	5	16	9	14	5	6
Future Volume (Veh/h)	4	575	8	7	373	23	5	16	9	14	5	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	605	8	7	393	24	5	17	9	15	5	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	417			613			1044	1048	609	1054	1040	405
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	417			613			1044	1048	609	1054	1040	405
tC, single (s)	4.1			4.3			7.2	6.5	6.3	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.4	3.7	4.0	3.3
p0 queue free %	100			99			97	93	98	91	98	99
cM capacity (veh/h)	1153			902			196	227	482	173	230	650

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	617	424	31	26
Volume Left	4	7	5	15
Volume Right	8	24	9	6
cSH	1153	902	260	221
Volume to Capacity	0.00	0.01	0.12	0.12
Queue Length 95th (m)	0.1	0.2	3.2	3.1
Control Delay (s)	0.1	0.2	20.7	23.5
Lane LOS	A	A	C	C
Approach Delay (s)	0.1	0.2	20.7	23.5
Approach LOS			C	C

Intersection Summary				
Average Delay	1.3			
Intersection Capacity Utilization	43.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Lanes, Volumes, Timings
5: Country Road 22 & Highway 400 South Ramp

06/11/2016

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	46	539	321	73	8	82
Future Volume (vph)	46	539	321	73	8	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.876	
Flt Protected		0.996			0.996	
Satd. Flow (prot)	0	1795	1824	1581	1591	0
Flt Permitted		0.996			0.996	
Satd. Flow (perm)	0	1795	1824	1581	1591	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		661.0	382.0		499.1	
Travel Time (s)		47.6	27.5		35.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	4%	3%	1%	25%	1%
Adj. Flow (vph)	48	567	338	77	8	86
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	615	338	77	94	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 63.3%		ICU Level of Service B	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
5: Country Road 22 & Highway 400 South Ramp

06/11/2016

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	46	539	321	73	8	82
Future Volume (Veh/h)	46	539	321	73	8	82
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	48	567	338	77	8	86
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	338				1001	338
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	338				1001	338
tC, single (s)	4.2				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.7	3.3
p0 queue free %	96				97	88
cM capacity (veh/h)	1194				234	706

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	615	338	77	94
Volume Left	48	0	0	8
Volume Right	0	0	77	86
cSH	1194	1700	1700	603
Volume to Capacity	0.04	0.20	0.05	0.16
Queue Length 95th (m)	1.0	0.0	0.0	4.4
Control Delay (s)	1.1	0.0	0.0	12.1
Lane LOS	A			B
Approach Delay (s)	1.1	0.0		12.1
Approach LOS				B

Intersection Summary			
Average Delay		1.6	
Intersection Capacity Utilization		63.3%	ICU Level of Service B
Analysis Period (min)		15	

Lanes, Volumes, Timings
6: Highway 400 North Ramp & County Road 22

06/11/2016

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	313	238	19	297	84	150
Future Volume (vph)	313	238	19	297	84	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.997	0.950	
Satd. Flow (prot)	1824	1581	0	1800	1785	1566
Flt Permitted				0.997	0.950	
Satd. Flow (perm)	1824	1581	0	1800	1785	1566
Link Speed (k/h)	50			80	50	
Link Distance (m)	382.0			36.2	392.3	
Travel Time (s)	27.5			1.6	28.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	1%	5%	4%	0%	2%
Adj. Flow (vph)	329	251	20	313	88	158
Shared Lane Traffic (%)						
Lane Group Flow (vph)	329	251	0	333	88	158
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 42.5%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
6: Highway 400 North Ramp & County Road 22

06/11/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	313	238	19	297	84	150
Future Volume (Veh/h)	313	238	19	297	84	150
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	329	251	20	313	88	158
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			329		682	329
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			329		682	329
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		79	78
cM capacity (veh/h)			1214		412	712

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2
Volume Total	329	251	333	88	158
Volume Left	0	0	20	88	0
Volume Right	0	251	0	0	158
cSH	1700	1700	1214	412	712
Volume to Capacity	0.19	0.15	0.02	0.21	0.22
Queue Length 95th (m)	0.0	0.0	0.4	6.4	6.8
Control Delay (s)	0.0	0.0	0.6	16.1	11.5
Lane LOS			A	C	B
Approach Delay (s)	0.0		0.6	13.1	
Approach LOS				B	

Intersection Summary				
Average Delay	3.0			
Intersection Capacity Utilization	42.5%	ICU Level of Service		A
Analysis Period (min)	15			

Lanes, Volumes, Timings
7: County Road 93 & County Road 22

06/11/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	366	68	20	268	35	69	113	33	38	55	29
Future Volume (vph)	53	366	68	20	268	35	69	113	33	38	55	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	180.0		0.0	185.0		0.0	157.0		0.0	150.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.976			0.983			0.966			0.948	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	1803	0	1733	1774	0	1623	1761	0	1785	1703	0
Flt Permitted	0.522			0.368			0.699			0.659		
Satd. Flow (perm)	971	1803	0	671	1774	0	1194	1761	0	1238	1703	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			13			29			31	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1121.3			305.8			269.5			271.6	
Travel Time (s)		80.7			22.0			19.4			19.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	2%	0%	3%	4%	5%	10%	4%	0%	0%	7%	0%
Adj. Flow (vph)	56	385	72	21	282	37	73	119	35	40	58	31
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	457	0	21	319	0	73	154	0	40	89	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	24.0	24.0		24.0	24.0		26.0	26.0		26.0	26.0	
Total Split (s)	31.0	31.0		31.0	31.0		31.0	31.0		31.0	31.0	
Total Split (%)	50.0%	50.0%		50.0%	50.0%		50.0%	50.0%		50.0%	50.0%	
Maximum Green (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	13.0	13.0		13.0	13.0		15.0	15.0		15.0	15.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	25.0	25.0		25.0	25.0		25.0	25.0		25.0	25.0	
Actuated g/C Ratio	0.40	0.40		0.40	0.40		0.40	0.40		0.40	0.40	

Lanes, Volumes, Timings
7: County Road 93 & County Road 22

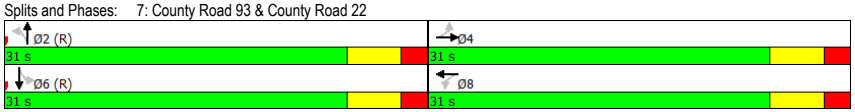
06/11/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.14	0.62		0.08	0.44		0.15	0.21		0.08	0.13	
Control Delay	13.0	18.6		12.4	15.2		12.9	10.7		12.1	8.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	13.0	18.6		12.4	15.2		12.9	10.7		12.1	8.9	
LOS	B	B		B	B		B	B		B	A	
Approach Delay		18.0			15.1			11.4			9.9	
Approach LOS		B			B			B			A	

Intersection Summary

Area Type: Other
Cycle Length: 62
Actuated Cycle Length: 62
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 50
Control Type: Pretimed
Maximum v/c Ratio: 0.62
Intersection Signal Delay: 15.1 Intersection LOS: B
Intersection Capacity Utilization 85.0% ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 7: County Road 93 & County Road 22



Queues
7: County Road 93 & County Road 22

06/11/2016

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	56	457	21	319	73	154	40	89
v/c Ratio	0.14	0.62	0.08	0.44	0.15	0.21	0.08	0.13
Control Delay	13.0	18.6	12.4	15.2	12.9	10.7	12.1	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.0	18.6	12.4	15.2	12.9	10.7	12.1	8.9
Queue Length 50th (m)	4.1	40.2	1.5	25.5	5.4	9.3	2.9	4.2
Queue Length 95th (m)	10.8	68.3	5.4	45.1	13.0	20.1	8.1	11.7
Internal Link Dist (m)		1097.3		281.8		245.5		247.6
Turn Bay Length (m)	180.0		185.0		157.0		150.0	
Base Capacity (vph)	391	737	270	723	481	727	499	705
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.62	0.08	0.44	0.15	0.21	0.08	0.13

Intersection Summary

APPENDIX D

Site Traffic Information

Projected Solid Waste Management Tonnages and Trucks to OPF/MMF per Day					
	Estimate	Estimate	Estimate	Estimate	
Year	**2021**	**2026**	**2031**	**2049**	
	OPF opens			facility end design life	
MMF vehicles inbound per day (5 day week)					
curbside garbage/organics (max case based on summer high season - multi loads for mini truc	40.5	44.8	49.4	70.6	
curbside recycling paper fibres/containers (Max. case based on summer high season - multi lo	39.4	43.5	48.0	68.6	
garbage from sites		4.7	5.4	9.2	
recycling from sites	2.3	2.5	2.7	3.9	
commercial inbound (Rama organics, L&LG, and target IC&I)	2.3	2.5	2.7	3.9	
additional recycling (full merchant capacity used from Barrie and Orillia)	20.2	23.5	27.2	-	
staff vehicles (MMF staff arriving in personal vehicles includes truck drivers)	15.0	16.0	17.0	20.0	
total inbound vehicles	119.7	137.4	152.6	176.2	
MMF vehicles outbound per day (5 day week)					
curbside garbage	4.5	5.3	6.1	10.4	
garbage from sites (consolidated)	-	2.1	2.4	4.1	
organics	1.2	-	-	-	
paper fibres	6.5	7.5	8.7	9.9	
containers	6.0	6.9	8.0	9.1	
total outbound vehicles	18.2	21.8	25.3	33.5	
OPF vehicles/operating day					
organics outbound from MMF					
bulking agent inbound (dependant on technology)	2.8	2.8	2.8	2.8	
additional organics (assuming worst case all out of area)	1.6	1.4	1.1	-	
outbound product (dependant on technology)	2.8	2.8	2.8	2.8	
OPF staffing (dependant on technology selected)	5.0	5.0	5.0	5.0	
Total Vehicles one way	12.1	12.0	11.7	10.6	
Summary for TIS					
MMF total vehicle estimate/operating day (HIGH - with merchant capacity)	138	159	178	210	
OPF total vehicle estimate/operating day (HIGH - with merchant capacity)	12	12	12	11	
MMF/OPF combined total vehicle estimate/operating day (HIGH - with merchant capacity)	150	171	190	220	
% design capacity utilized	**2021**	**2026**	**2031**	**2049**	
garbage	43%	50%	58%	98%	
paper fibres	66%	76%	88%	100%	
recycling	66%	76%	88%	100%	
organics	100%	100%	100%	100%	

Vehicle Category	Trip Generation Detailed Explanatory Notes
1	• *Use the highest hourly distributions (see Table 3.3) during the a.m. and p.m. periods multiplied by the relevant projected loads per day;* • *All inbound trucks will stay 30 minutes and then return to the fuelling station in Barrie, so outbound trips are assumed to be equal to inbound trips during the peak hour.*
2	• *Use the highest hourly distributions (see Table 3.4) during the a.m. and p.m. periods multiplied by the relevant projected loads per day;* • *All inbound trucks will stay 30 minutes and then return to the fuelling station in Barrie, so outbound trips are assumed to be equal to inbound trips during the peak hour.*
3	• *Assume that loads will be hauled by multiple trucks. However, in reality some of the loads may be hauled by the same vehicle. For example, one truck may leave during the a.m. period and haul multiple loads throughout day from various sites, and then return during the p.m. period;* • *No projections for 2021 since garbage from all sites will be landfilled until Site 2 in Collingwood closes. Assume that this garbage will come to the MMF for export in 2023;* • *Home based fleet;* • *Truck leaves at 7 a.m. which is outside of our studied peak hour;* • *Assume that all vehicles return to the site during the a.m. peak hour;* • *Last inbound truck is at 4 p.m. which is outside of our studied peak hour.*
4	• *Same assumption as above that all loads will be hauled by different trucks.* • *Home based fleet;* • *Truck leaves at 7 a.m. which is outside of our studied peak hour;* • *Assume that all vehicles return to the site during the a.m. peak hour;* • *Last inbound truck is at 4 p.m. which is outside of our studied peak hour.*
5	• *No inbound or outbound trucks during the a.m. peak hour;* • *Last inbound truck is at 4 p.m. which is outside of our studied peak hour;* • *Assume that all vehicles leave the site during the p.m. peak hour.*
6	• *No inbound or outbound trucks during the a.m. peak hour;* • *The hourly distribution is expected to be similar to the hourly distribution of the County's curbside recycling trucks to derive the peak hour traffic for this crew;* • *Use the highest hourly distributions (see Table 3.4) during the a.m. and p.m. periods multiplied by the relevant projected trips per day;* • *No projections for 2049 since tonnage of County material will reach the design capacity.*
7	• *Staff arrive at the site around 6:30 a.m. which is outside of our studied peak hour;* • *Assume that all vehicles leave the site during the p.m. peak hour.*
8	• *All trucks leave by 2 p.m.;* • *Assume a worst case scenario that all loads are served during the a.m. peak hour. These loads could be served by multiple trips made by a few trucks throughout the day;* • *No inbound or outbound trucks during the p.m. peak hour.*

Vehicle Category	Trip Generation Detailed Explanatory Notes
9	• *No projections for 2021 since garbage from all sites will be landfilled until Site 2 in Collingwood closes in 2022. Assume that this garbage will come to the MMF for export in 2023;* • *All trucks leave by 2 p.m.;* • *Assume a worst case scenario that all loads are served during the a.m. peak hour. These loads could be served by multiple trips made by a few trucks throughout the day;* • *No inbound or outbound trucks during the p.m. peak hour.*
10	• *No projections for 2026, 2031 or 2049 since OPF will be online during 2021;* • *Home based fleet;* • *Assume that all vehicles leave the site during the a.m. peak hour and enter the site during the p.m. peak hour.*
11	• *All trucks leave by 2 p.m.;* • *Assume a worst case scenario that all loads are served during the a.m. peak hour. These loads could be served by multiple trips made by a few trucks throughout the day;* • *No inbound or outbound trucks during the p.m. peak hour.*
12	• *All trucks leave by 2 p.m.;* • *Assume a worst case scenario that all loads are served during the a.m. peak hour. These loads could be served by multiple trips made by a few trucks throughout the day;* • *No inbound or outbound trucks during the p.m. peak hour.*
13	• *Assume that loads will be hauled by multiple trucks. However, in reality, some of the loads may be hauled by the same vehicle. For example, one truck may leave during the a.m. period and haul multiple loads throughout day from various sites and return during the p.m. period;* • *Home based fleet and last inbound truck is at 4 p.m. which is outside of our studied peak hour;* • *Assume that all vehicles leave the site during the a.m. peak hour.*
14	• *No projections for 2049 since the tonnage of County material will reach the design capacity;* • *No inbound or outbound trucks during a.m. peak hour;* • *Assume that all vehicles leave the site during the p.m. peak hour.*
15	• *Assume that loads will be hauled by multiple trucks. However, in reality, some of the loads may be hauled by the same vehicle;* • *Home based fleet and last inbound truck is at 4:30 p.m.;* • *Assume that all vehicles leave the site during the a.m. peak hour and enter the site during the p.m. peak hour.*
16	• *Staff arrive at the site around 6:30 a.m. which is outside of our studied peak hour;* • *Assume that all vehicles leave the site during the p.m. peak hour.*

APPENDIX E

Background Traffic Information

MMM GROUP

County of Simcoe

Transportation and Engineering Department
Midhurst, Ontario
(705)-726-9300

County Road 22 - Summer 2014
County Road 93 to
Highway 400

Site Code: 022 04

County Road 93
Highway 400

Start	14-Jul-14		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	18	13	5	13	19	9	9	15	*	*	*	*	*	*	13	12
01:00	5	16	2	10	9	15	4	11	*	*	*	*	*	*	5	13
02:00	5	10	5	5	2	3	3	5	*	*	*	*	*	*	4	6
03:00	13	8	18	5	12	3	16	12	*	*	*	*	*	*	15	7
04:00	50	38	67	37	67	31	65	43	*	*	*	*	*	*	62	37
05:00	79	91	91	108	104	109	98	114	*	*	*	*	*	*	93	106
06:00	182	140	180	127	186	138	194	144	*	*	*	*	*	*	186	137
07:00	192	154	217	208	**222**	202	211	194	*	*	*	*	*	*	210	190
08:00	189	214	196	199	202	208	**218**	225	*	*	*	*	*	*	201	212
09:00	190	198	192	165	193	190	169	**238**	*	*	*	*	*	*	186	198
10:00	**224**	195	229	**210**	195	**230**	209	235	*	*	*	*	*	*	**214**	218
11:00	188	**266**	**246**	198	212	221	208	221	*	*	*	*	*	*	214	**226**
12:00 PM	198	232	222	230	214	221	199	246	*	*	*	*	*	*	208	232
01:00	202	224	196	243	218	223	214	263	*	*	*	*	*	*	208	238
02:00	179	207	186	226	199	230	220	269	*	*	*	*	*	*	196	233
03:00	211	302	212	283	229	309	238	323	*	*	*	*	*	*	222	304
04:00	**250**	**346**	**254**	**357**	**237**	**345**	**268**	**364**	*	*	*	*	*	*	**252**	**353**
05:00	179	246	210	268	209	263	232	291	*	*	*	*	*	*	208	267
06:00	131	167	127	163	135	161	142	195	*	*	*	*	*	*	134	172
07:00	106	129	106	130	132	152	121	171	*	*	*	*	*	*	116	146
08:00	71	126	82	122	87	122	111	150	*	*	*	*	*	*	88	130
09:00	51	55	48	75	56	81	45	81	*	*	*	*	*	*	50	73
10:00	20	38	47	41	38	34	39	40	*	*	*	*	*	*	36	38
11:00	15	15	67	18	17	17	31	28	*	*	*	*	*	*	32	20
Lane	2948	3430	3205	3441	3194	3517	3264	3878	0	0	0	0	0	0	3153	3568
Day	6378		6646		6711		7142		0		0		0		6721	
AM Peak	10:00	11:00	11:00	10:00	07:00	10:00	08:00	09:00	-	-	-	-	-	-	10:00	11:00
Vol.	224	266	246	210	222	230	218	238	-	-	-	-	-	-	214	226
PM Peak	16:00	16:00	16:00	16:00	16:00	16:00	16:00	16:00	-	-	-	-	-	-	16:00	16:00
Vol.	250	346	254	357	237	345	268	364	-	-	-	-	-	-	252	353

Comb. Total	6378	6646	6711	7142	0	0	0	6721

ADT ADT 6,719 AADT 6,719

County of Simcoe

Transportation and Engineering Department
Midhurst, Ontario
(705)-726-9300

County Road 22 - Summer 2014
Highway 400 to
County Road 27

Site Code: 022 05

Highway 400
County Road 27

Start	14-Jul-14		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	25	45	13	15	8	82	19	24	*	*	*	*	*	*	16	42
01:00	12	19	7	9	6	44	12	12	*	*	*	*	*	*	9	21
02:00	8	15	6	2	3	13	4	7	*	*	*	*	*	*	5	9
03:00	6	6	4	7	4	10	5	10	*	*	*	*	*	*	5	8
04:00	3	2	9	8	3	7	6	6	*	*	*	*	*	*	5	6
05:00	26	14	34	16	29	17	36	14	*	*	*	*	*	*	31	15
06:00	97	53	102	53	108	55	118	65	*	*	*	*	*	*	106	56
07:00	158	94	147	99	173	105	159	119	*	*	*	*	*	*	159	104
08:00	185	143	213	150	213	161	220	167	*	*	*	*	*	*	208	155
09:00	**233**	164	202	150	207	166	196	136	*	*	*	*	*	*	210	154
10:00	196	200	195	155	213	151	242	161	*	*	*	*	*	*	212	167
11:00	229	**225**	**224**	**200**	**235**	**215**	**245**	**205**	*	*	*	*	*	*	**233**	**211**
12:00 PM	251	232	227	234	231	203	242	221	*	*	*	*	*	*	238	222
01:00	263	246	227	220	209	231	266	247	*	*	*	*	*	*	241	236
02:00	222	241	247	210	227	234	249	230	*	*	*	*	*	*	236	229
03:00	208	227	230	218	244	213	275	226	*	*	*	*	*	*	239	221
04:00	275	278	259	221	272	253	**322**	265	*	*	*	*	*	*	282	254
05:00	**321**	**342**	**299**	**306**	**315**	**270**	319	**315**	*	*	*	*	*	*	**314**	**308**
06:00	197	272	250	261	259	260	282	302	*	*	*	*	*	*	247	274
07:00	162	138	157	138	157	155	241	165	*	*	*	*	*	*	179	149
08:00	127	108	121	115	135	137	151	129	*	*	*	*	*	*	134	122
09:00	100	82	122	89	97	112	156	112	*	*	*	*	*	*	119	99
10:00	63	56	72	60	84	67	78	68	*	*	*	*	*	*	74	63
11:00	27	32	33	47	21	46	33	45	*	*	*	*	*	*	28	42
Lane	3394	3234	3400	2983	3453	3207	3876	3251	0	0	0	0	0	0	3530	3167
Day	6628		6383		6660		7127		0		0		0		6697	
AM Peak	09:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00	-	-	-	-	-	-	11:00	11:00
Vol.	233	225	224	200	235	215	245	205	-	-	-	-	-	-	233	211
PM Peak	17:00	17:00	17:00	17:00	17:00	17:00	16:00	17:00	-	-	-	-	-	-	17:00	17:00
Vol.	321	342	299	306	315	270	322	315	-	-	-	-	-	-	314	308

Comb. Total	6628	6383	6660	7127	0	0	0	6697

ADT ADT 6,700 AADT 6,700

For the purpose of this study, no improvements to the intersections of County Road 22 with 3rd Line, County Road 22 with Horseshoe Resort entrance, and County Road 22 with 4th Line were assumed. Improvement needs and timing of improvements for all three intersections will be identified in this study.

3.4 Future Traffic Volumes

Given that development growth has been considered specifically and that AADT growth rates for the section of County Road 22 are in the order of –0.4% to 0.53% for the past 9 years, an annual general background growth rate of 1.0% was applied for traffic volumes on County Road 22.

Estimates of future traffic volumes for the years 2018, 2023 and 2033 have been determined based on the following:

- 2013 traffic volumes;
- development specific volumes (as per volumes provided in Figures 1C to 12C); and
- a 1.0% annual background growth rate.

The resulting future traffic projections are provided in Figures 6 to 8 for the 2018, 2023 and 2033 horizons respectively. The AM and PM peak hour volumes are provided, reflective of weekday conditions.

3.5 Future Traffic Operations

3.5.1 Future 2018 Operations

Based on the existing intersection configurations and controls, analysis of the intersections was carried out for the future 2018 peak hour traffic volumes. A summary of the assessment is provided in Table 5. As previously noted, Level of Service (LOS) A corresponds to the best operating condition with minimal delays whereas LOS F corresponds to poor operations resulting from high delays. The corresponding worksheets are provided in Appendix B.

TABLE 5 – INTERSECTION OPERATIONS – 2018 TRAFFIC VOLUMES

INTERSECTION		CONTROL	AM PEAK HOUR			PM PEAK HOUR		
			Delay(s)	LOS	v/c	Delay(s)	LOS	v/c
County Road 22 & 3rd Line	NB	stop	12.9	B	0.15	21.9	C	0.38
	WBL	free	8.0	A	0.02	8.8	A	0.03
County Road 22 & Horseshoe Resort Entrance	NBL	stop	13.5	B	0.07	22.5	C	0.27
	NBT-R		8.9	A	0.01	10.5	B	0.07
	EBL	free	7.7	A	0.01	7.8	A	0.01
	WBL		7.8	A	0.03	8.5	A	0.03
	SB	stop	10.5	B	0.02	15.5	C	0.04
County Road 22 & 4th Line	NB	stop	11.6	B	0.13	17.8	C	0.25

Traffic growth will depend largely on the population and employment growth of an area. The population and employment forecasts for the Township of Springwater are documented in the following reports:

- *Simcoe County Land Budget Data Collection and Analysis Phase 1: Population Growth* prepared by Simcoe County Planning Department dated February 2015
- *Proposed Amendment 1 to the Growth Plan for the Greater Golden Horseshoe, 2006* by the Ministry of Infrastructure dated October 2010
- *Simcoe Area Growth Plan* prepared by Hemson Consulting Ltd. Dated May 2008.

Future population and employment projections are provided in Table 3.

TABLE 3 – POPULATION AND EMPLOYMENT FORECASTS

COMMUNITY	POPULATION			EMPLOYMENT		
	2011	2031	ANNUAL GROWTH	2006	2031	ANNUAL GROWTH
Township of Springwater	18,749	24,000	1.2%	5,000	5,600	0.5%

It is assumed that projected growth includes some of the Midhurst developments, but not all Phase 1 of the Midhurst developments.

Given that Midhurst development growth will be considered specifically and that the average growth rate for the section of Highway 26 is 1.09% for the past five years, an annual general background growth rate of 1.0% was applied for traffic volumes on Highway 26, CR 27, Wilson Drive, Snow Valley Road and Finlay Mill Road – Doran Road – Forbes Road corridor. While there may be other specific developments that may increase traffic volumes in the area, these have been accounted for in the assumed growth rate. The resulting 2031 and 2041 background peak hour traffic volumes are illustrated in Figures 3 and 4 respectively.

3.3 Background Traffic Operations

The operational analyses at the area key intersections were repeated given the future background traffic volumes and existing intersection/road configurations. Given that a traffic signal is warranted at the intersection of Highway 26/CR 27 at Spence Avenue, a traffic signal is assumed at the intersection with an exclusive left turn lane on each approach. The improvements listed in Section 3.1 were also assumed.

A summary of the assessment is provided in Tables 4 and 5 for the 2031 and 2041 horizons respectively. As previously noted level of service (LOS) "A" corresponds to the best operating condition with minimal delays whereas LOS "F" corresponds to poor operations resulting from high intersection delays. The corresponding worksheets are provided in Appendix B.

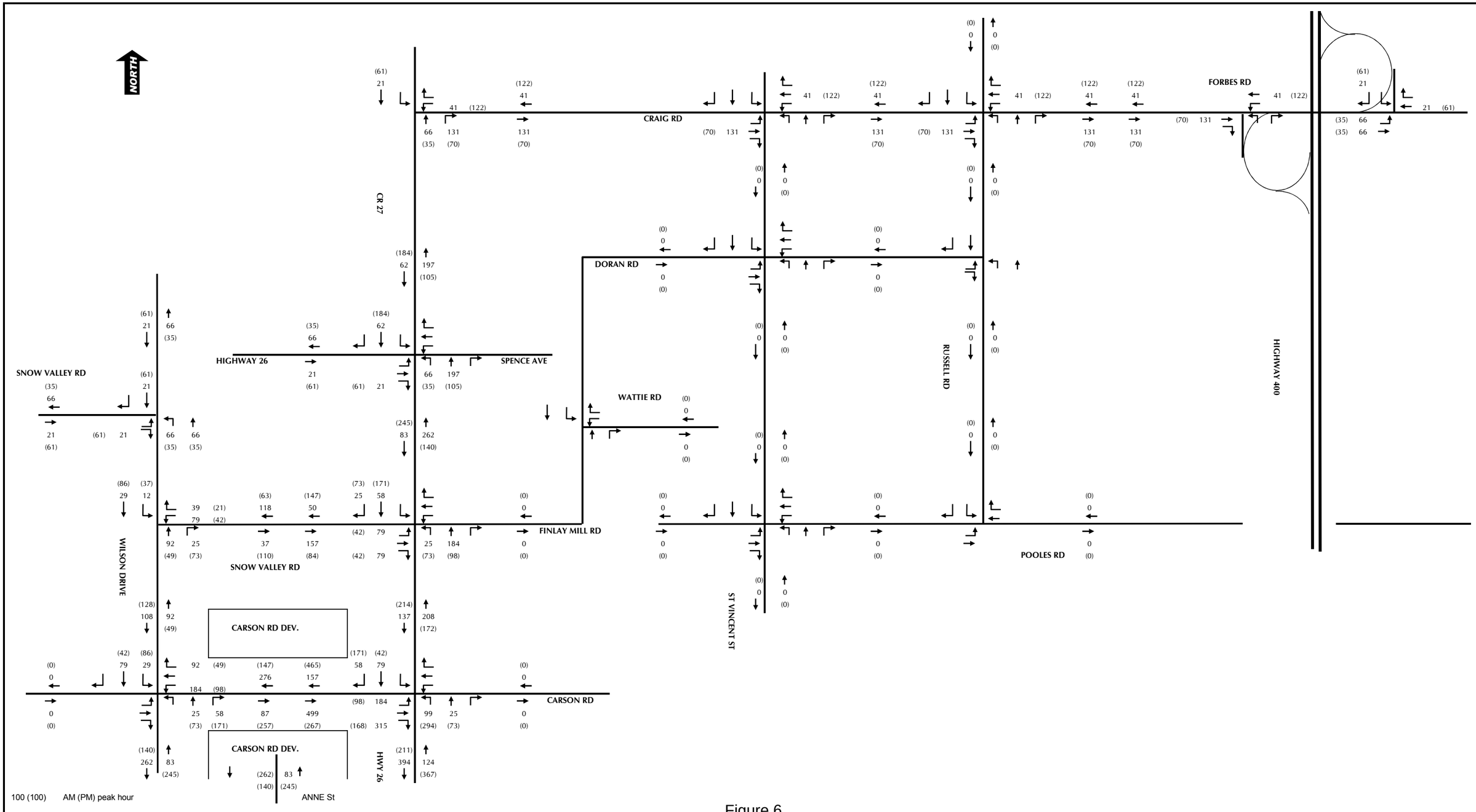
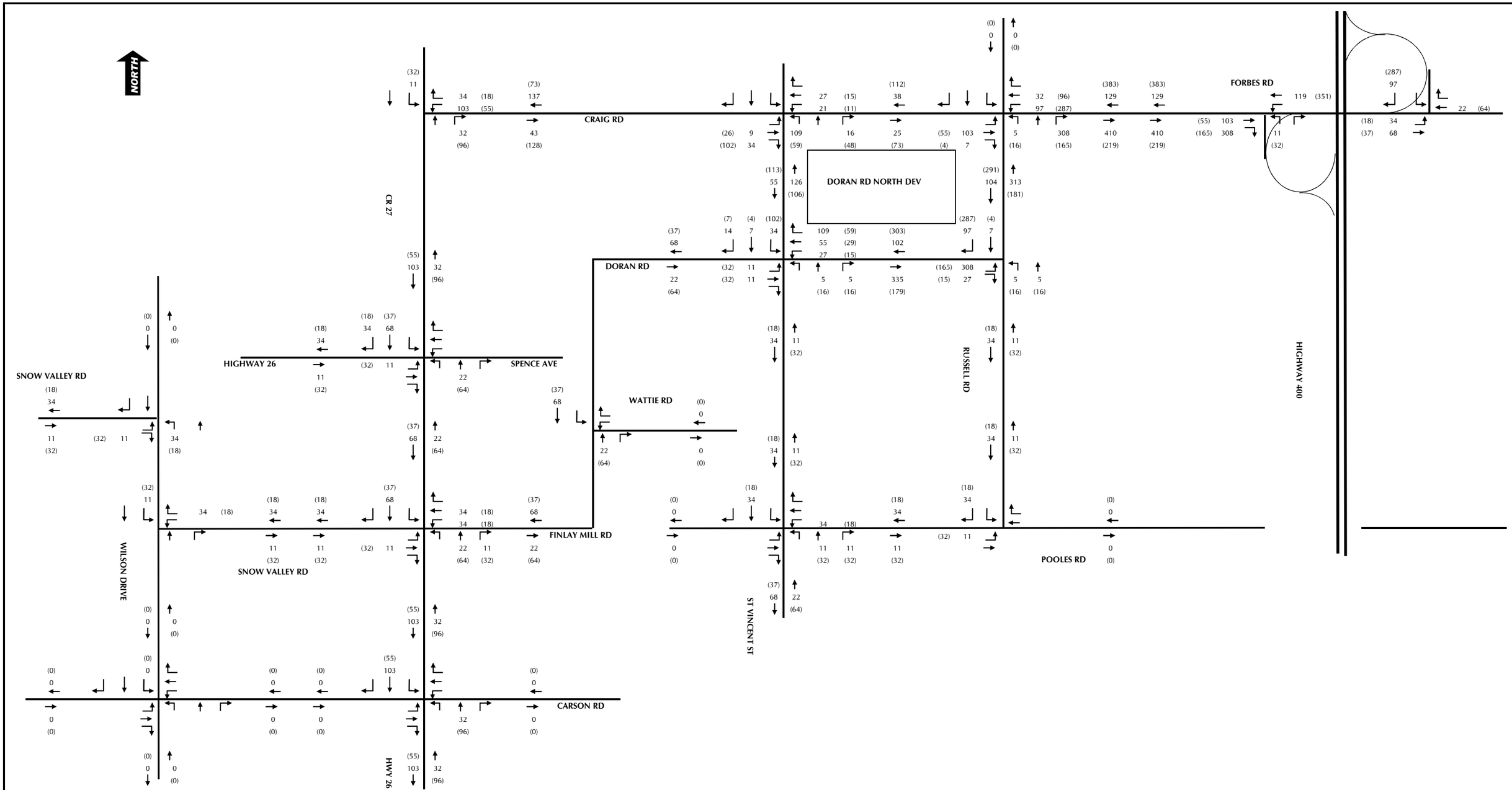


Figure 6
Carson Road Development Generated Traffic Volumes
Midhurst EA Phases 3 & 4
Township of Springwater



100 (100) AM (PM) peak hour

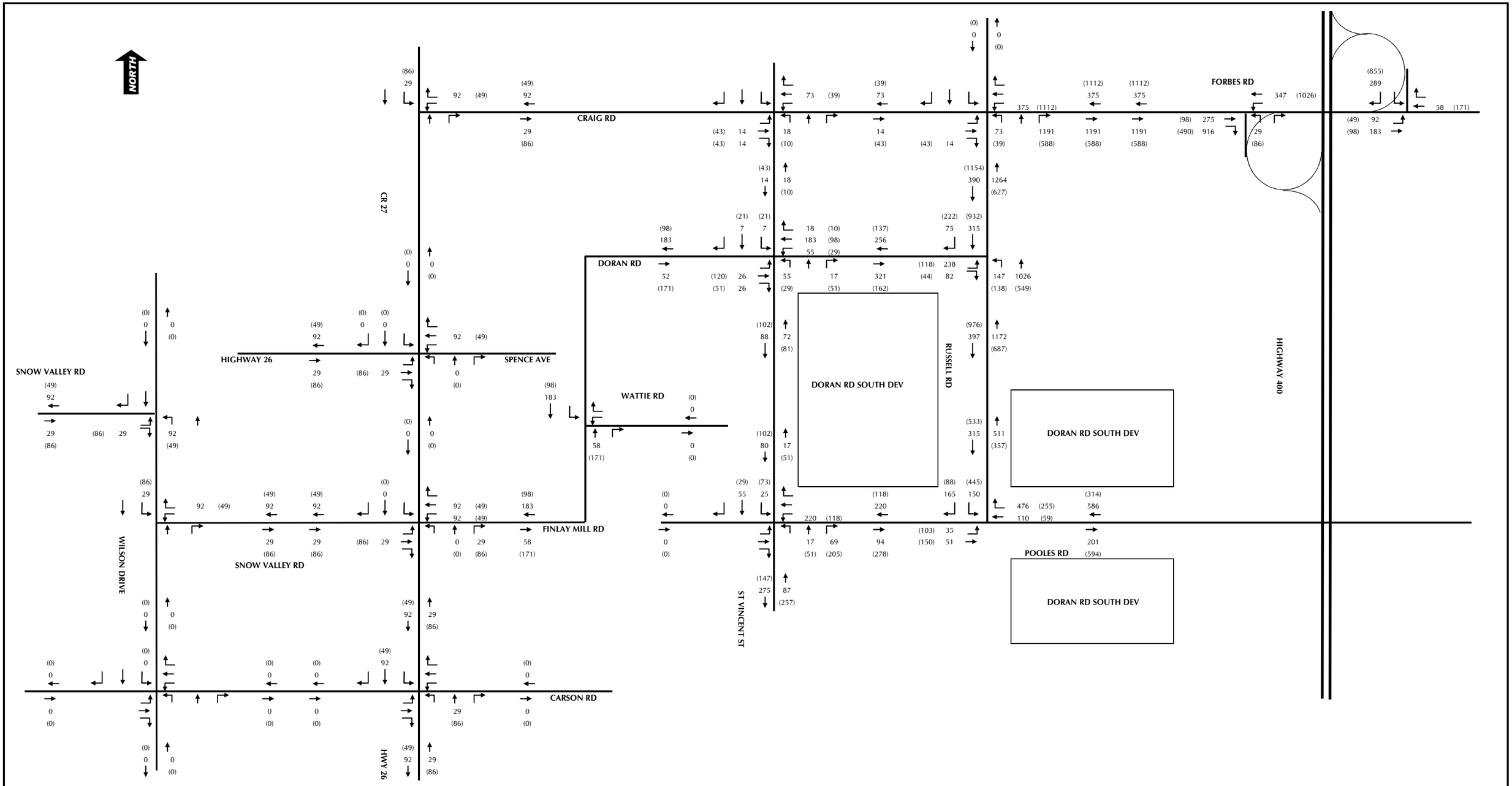
Figure 7

Doran Road North Development Generated Traffic Volumes

Midhurst EA Phases 3 & 4

Township of Springwater

Ainley Group CONSULTING ENGINEERS PLANNERS



100 (100) AM (PM) peak hour

Figure 8

Doran Road South Development Generated Traffic Volumes

Midhurst EA Phases 3 & 4

Township of Springwater

Ainley Group CONSULTING ENGINEERS PLANNERS

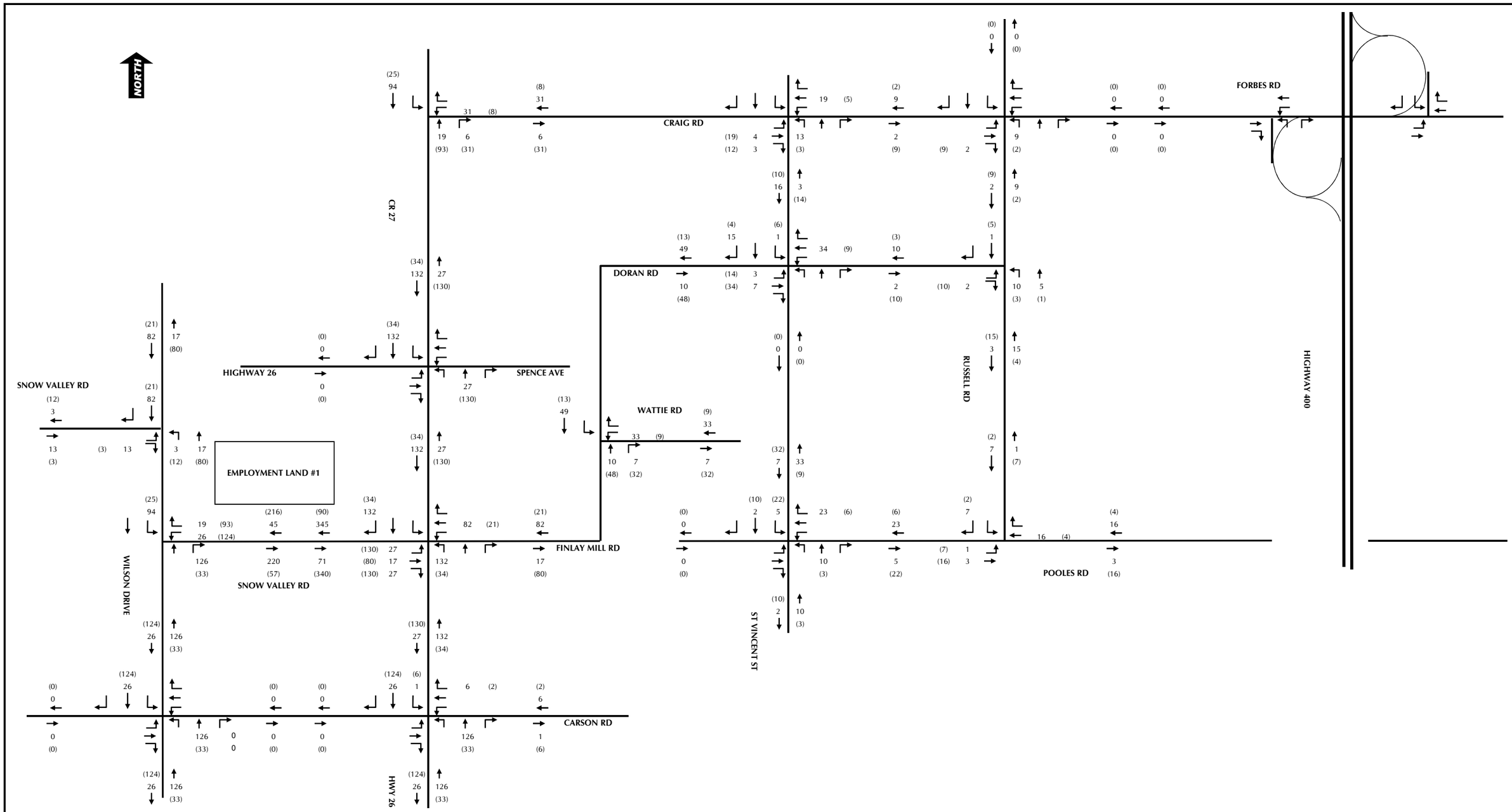


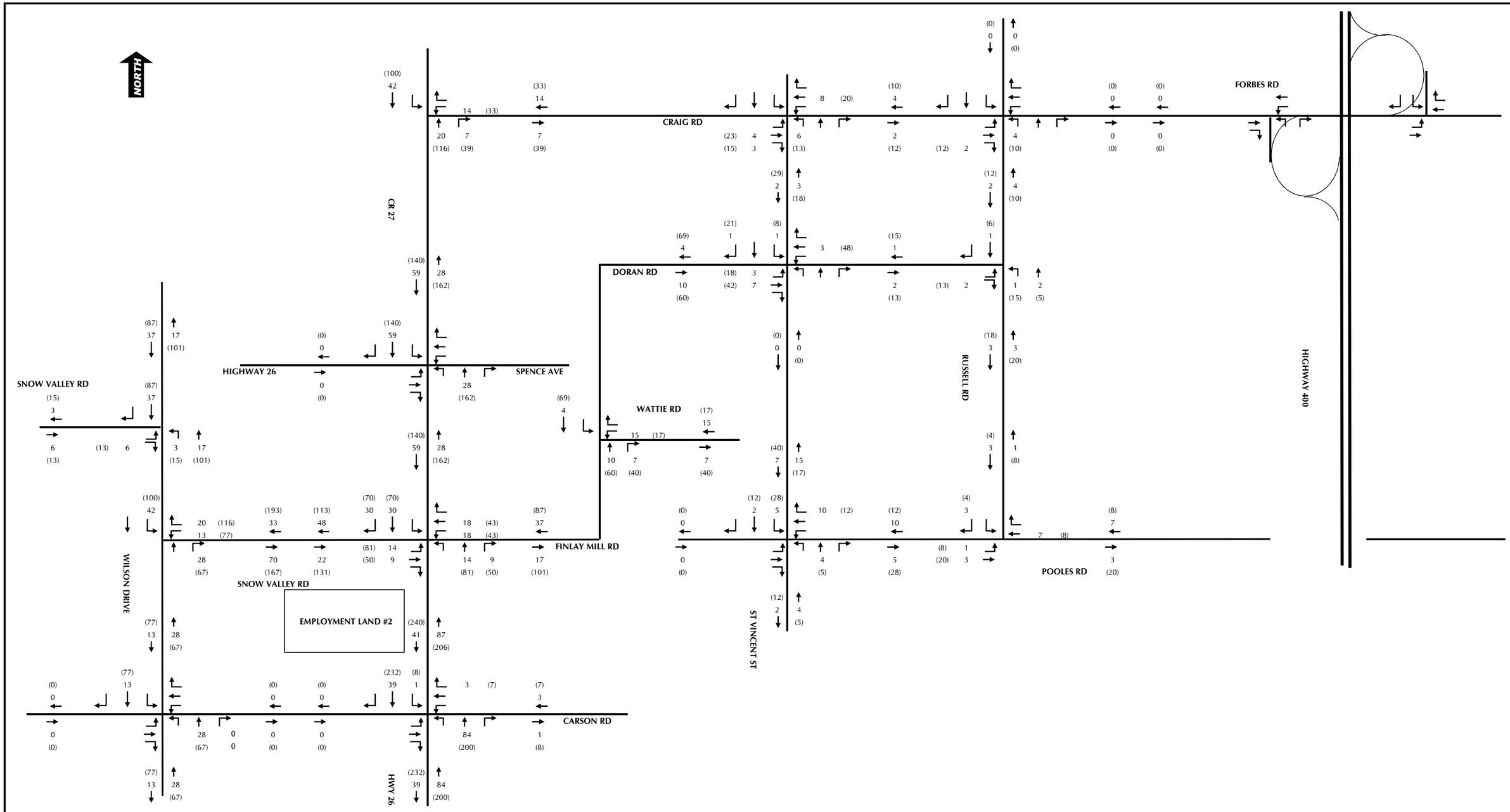
Figure 9

Employment Land #1 Development Generated Traffic Volumes

Midhurst EA Phases 3 & 4

Township of Springwater

Ainley Group CONSULTING ENGINEERS PLANNERS



100 (100) AM (PM) peak hour

Figure 10

Employment Land #2 Development Generated Traffic Volumes

Midhurst EA Phases 3 & 4

Township of Springwater

Ainley Group CONSULTING ENGINEERS PLANNERS

Background Development Traffic Trip Distribution

Background #	Scenario	Gateway								
		Gateway 1	**Gateway 2**	**Gateway 3**	**Gateway 4**	**Gateway 5**	**Gateway 6**	**Gateway 7**	**Gateway 8**	**Gateway 9**
1, 2, 8 & 9	A.M. Inbound	29%	10%	12%	0%	0%	30%	11%	0%	7%
	A.M. Outbound	33%	13%	8%	0%	26%	2%	10%	0%	7%
	P.M. Inbound	25%	7%	11%	0%	1%	32%	8%	0%	18%
	P.M. Outbound	32%	14%	7%	0%	19%	4%	16%	0%	8%
3	A.M. Inbound	29%	10%	12%	0%	0%	30%	11%	0%	7%
	A.M. Outbound	33%	13%	8%	0%	26%	2%	10%	0%	7%
	P.M. Inbound	25%	7%	11%	0%	1%	32%	8%	0%	18%
	P.M. Outbound	32%	14%	7%	0%	19%	4%	16%	0%	8%
4*	A.M. Inbound	6%	2%	2%	0%	10%	0%	5%	0%	0%
	A.M. Outbound	6%	2%	2%	0%	10%	0%	0%	0%	0%
	P.M. Inbound	6%	2%	3%	0%	10%	0%	10%	0%	0%
	P.M. Outbound	6%	3%	1%	0%	10%	0%	0%	0%	0%
5*	A.M. Inbound	5%	0%	46%	0%	0%	1%	0%	7%	0%
	A.M. Outbound	6%	0%	46%	0%	2%	2%	0%	5%	0%
	P.M. Inbound	5%	0%	46%	0%	0%	1%	0%	7%	0%
	P.M. Outbound	4%	0%	47%	0%	2%	2%	0%	0%	5%
6*	A.M. Inbound	0%	9%	6%	0%	0%	6%	0%	38%	0%
	A.M. Outbound	0%	12%	5%	0%	9%	8%	0%	25%	0%
	P.M. Inbound	0%	7%	4%	0%	0%	13%	0%	36%	0%
	P.M. Outbound	0%	10%	5%	0%	8%	10%	0%	27%	0%
7*	A.M. Inbound	20%	7%	8%	0%	12%	8%	0%	46%	0%
	A.M. Outbound	21%	8%	5%	0%	14%	13%	0%	38%	0%
	P.M. Inbound	20%	6%	9%	0%	11%	14%	0%	40%	0%
	P.M. Outbound	21%	9%	5%	0%	11%	15%	0%	39%	0%
10*	A.M. & P.M. Inbound	19%	7%	8%	0%	0%	11%	0%	18%	10%
	A.M. & P.M. Outbound	19%	6%	5%	0%	17%	1%	0%	18%	10%
11*	A.M. Inbound	0%	0%	100%	0%	0%	0%	0%	0%	0%
	A.M. Outbound	0%	100%	0%	0%	0%	0%	0%	0%	0%
	P.M. Inbound	0%	100%	0%	0%	0%	0%	0%	0%	0%
	P.M. Outbound	0%	0%	100%	0%	0%	0%	0%	0%	0%

*Sums may not add up to 100% due to some trips are outside of the study area based on the location of the developments.

** Sums may not add up to 100% due to rounding.

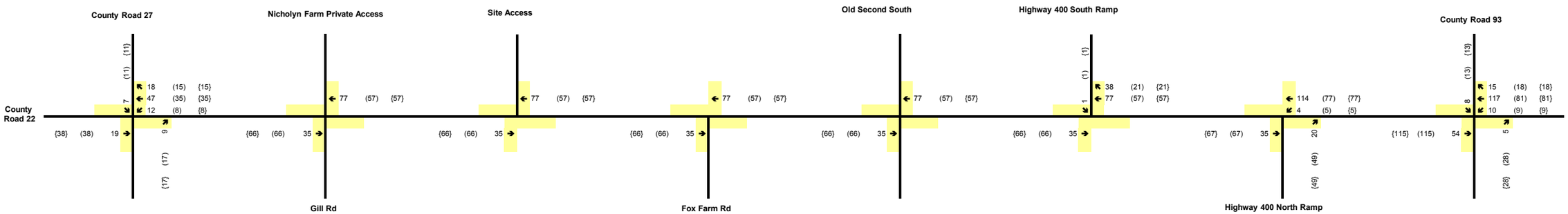


*Figure Not to Scale

LEGEND

XX Weekday AM Peak Hour Volumes
(XX) Weekday PM Peak Hour Volumes
{XX} Friday PM Peak Hour Volumes

FIGURE E1

Background Development #1

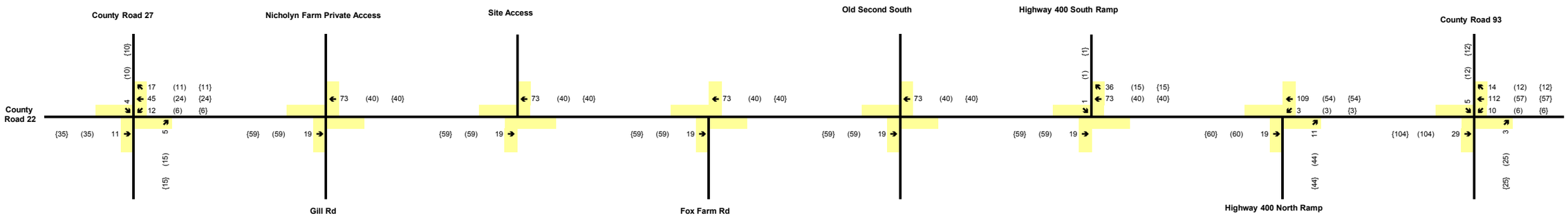


*Figure Not to Scale

LEGEND

XX Weekday AM Peak Hour Volumes
(XX) Weekday PM Peak Hour Volumes
{XX} Friday PM Peak Hour Volumes

FIGURE E2

Background Development #2

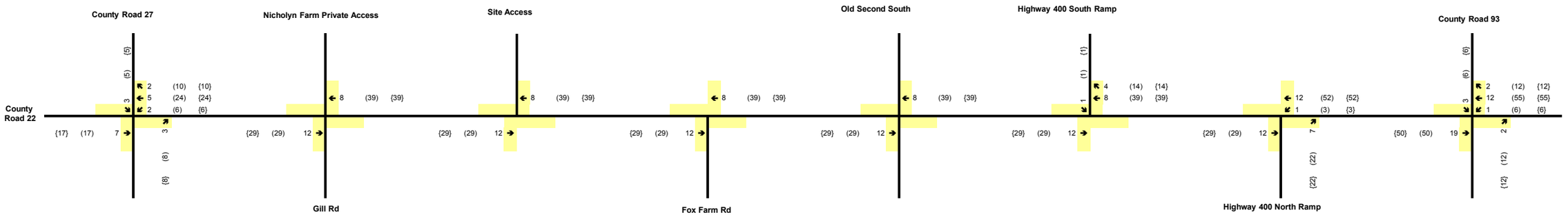


*Figure Not to Scale

LEGEND

XX	Weekday AM Peak Hour Volumes
(XX)	Weekday PM Peak Hour Volumes
{XX}	Friday PM Peak Hour Volumes

FIGURE E3

Background Development #3

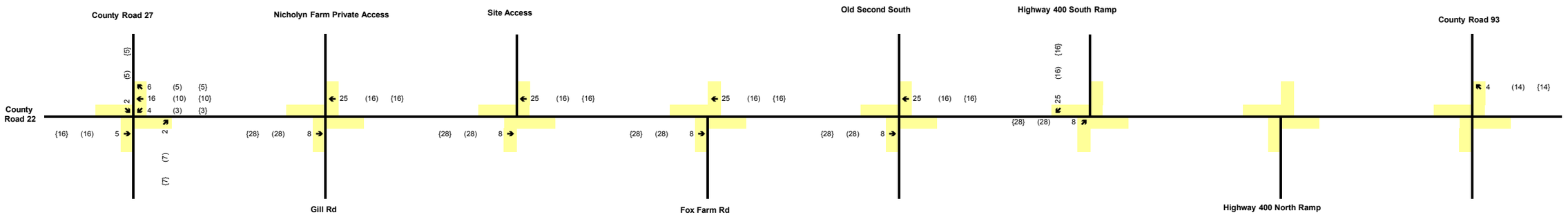


*Figure Not to Scale

LEGEND

XX	Weekday AM Peak Hour Volumes
(XX)	Weekday PM Peak Hour Volumes
{XX}	Friday PM Peak Hour Volumes

FIGURE E4

Background Development #4

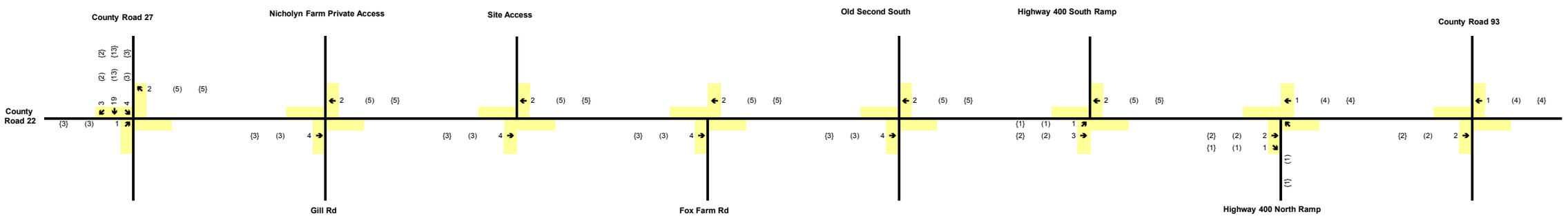


*Figure Not to Scale

LEGEND

XX	Weekday AM Peak Hour Volumes
(XX)	Weekday PM Peak Hour Volumes
{XX}	Friday PM Peak Hour Volumes

FIGURE E5

Background Development #5

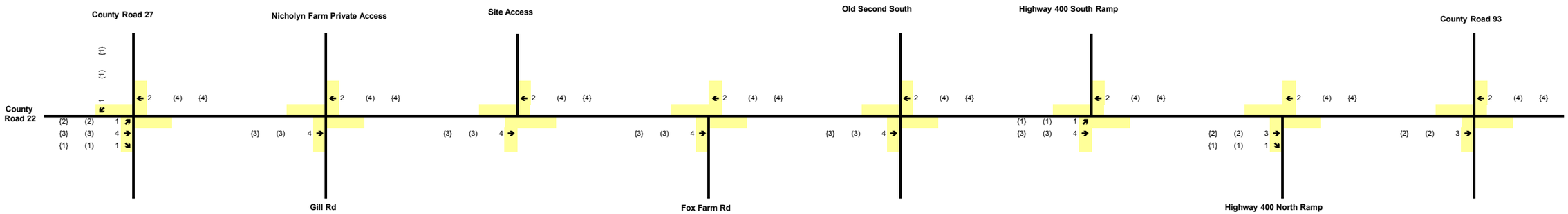


*Figure Not to Scale

LEGEND

XX	Weekday AM Peak Hour Volumes
(XX)	Weekday PM Peak Hour Volumes
{XX}	Friday PM Peak Hour Volumes

FIGURE E6

Background Development #6

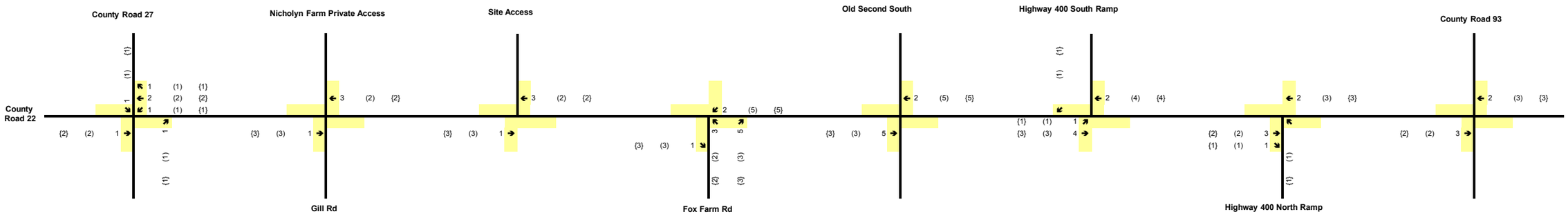


*Figure Not to Scale

LEGEND

XX	Weekday AM Peak Hour Volumes
(XX)	Weekday PM Peak Hour Volumes
{XX}	Friday PM Peak Hour Volumes

WSP | MMM GROUP

FIGURE E7a

Background Development #7 - 2021

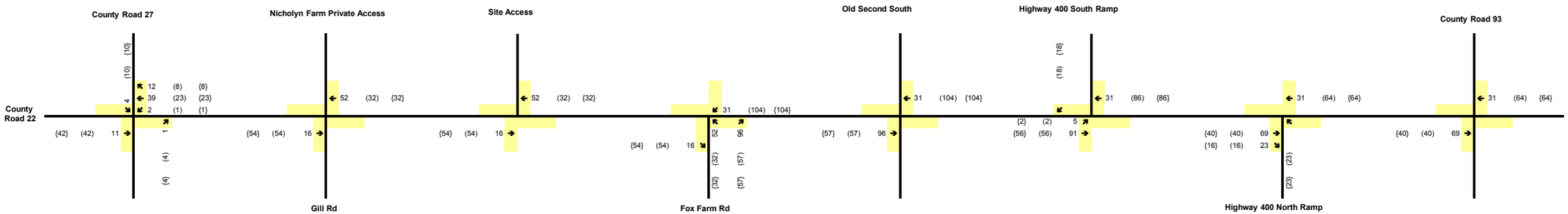


*Figure Not to Scale

LEGEND

XX Weekday AM Peak Hour Volumes
(XX) Weekday PM Peak Hour Volumes
{XX} Friday PM Peak Hour Volumes

WSP | MMM GROUP

FIGURE E7b

Background Development #7 - 2031

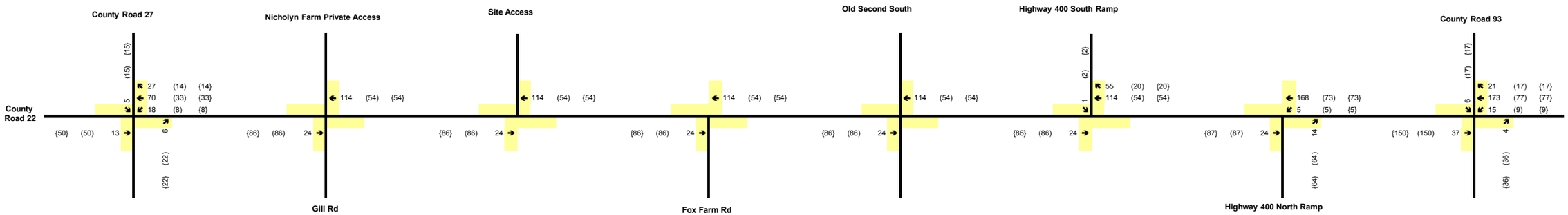


*Figure Not to Scale

LEGEND

XX Weekday AM Peak Hour Volumes
(XX) Weekday PM Peak Hour Volumes
{XX} Friday PM Peak Hour Volumes

FIGURE E8

Background Development #8

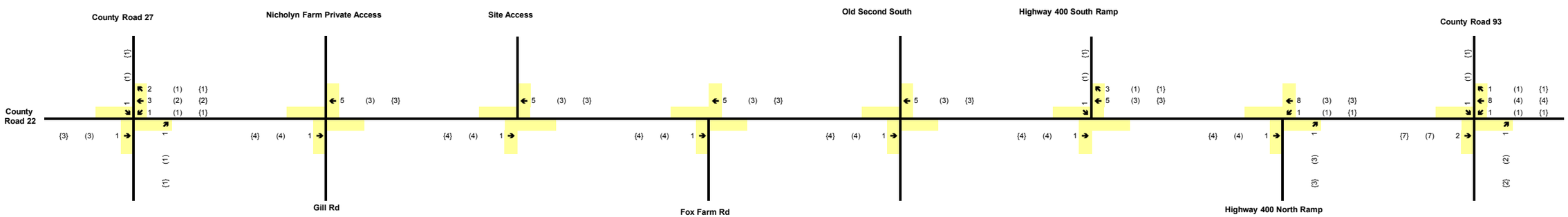


*Figure Not to Scale

LEGEND

XX	Weekday AM Peak Hour Volumes
(XX)	Weekday PM Peak Hour Volumes
{XX}	Friday PM Peak Hour Volumes

FIGURE E9

Background Development #9

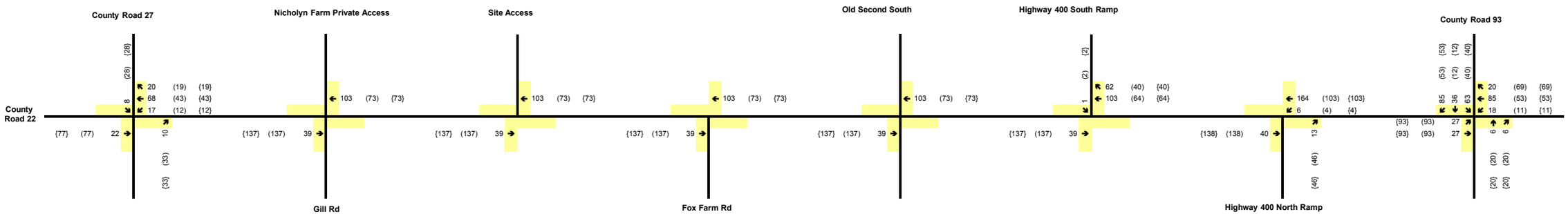


*Figure Not to Scale

LEGEND

XX Weekday AM Peak Hour Volumes
(XX) Weekday PM Peak Hour Volumes
{XX} Friday PM Peak Hour Volumes

FIGURE E10

Background Development #10

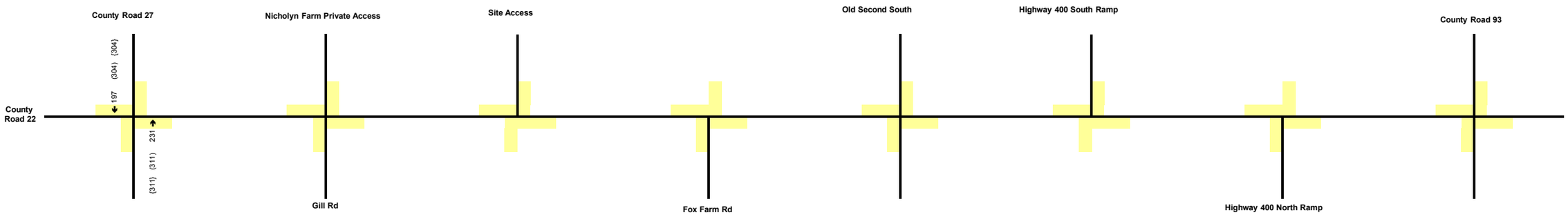


*Figure Not to Scale

LEGEND

XX	Weekday AM Peak Hour Volumes
(XX)	Weekday PM Peak Hour Volumes
{XX}	Friday PM Peak Hour Volumes

FIGURE E11

Background Development #11

APPENDIX F

Future Background Intersection Capacity Analysis Boundary Intersections

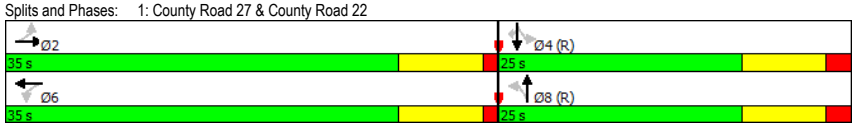
MMM GROUP

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	189	17	75	300	112	23	353	78	70	306	40
Future Volume (vph)	40	189	17	75	300	112	23	353	78	70	306	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	110.0		0.0	0.0		0.0	130.0		0.0	125.0		110.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			0.0			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.988			0.969			0.973				0.850
Flt Protected	0.950				0.992		0.950			0.950		
Satd. Flow (prot)	1767	1757	0	0	1711	0	1700	3474	0	1668	1842	1597
Flt Permitted	0.457				0.910		0.515			0.490		
Satd. Flow (perm)	850	1757	0	0	1570	0	922	3474	0	860	1842	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			34			44				75
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		515.9			1538.1			209.3			305.4	
Travel Time (s)		23.2			69.2			9.4			13.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	5%	13%	8%	7%	0%	5%	0%	0%	7%	2%	0%
Adj. Flow (vph)	42	199	18	79	316	118	24	372	82	74	322	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	217	0	0	513	0	24	454	0	74	322	42
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		4
Minimum Split (s)	27.8	27.8		27.8	27.8		17.8	17.8		17.8	17.8	17.8
Total Split (s)	35.0	35.0		35.0	35.0		25.0	25.0		25.0	25.0	25.0
Total Split (%)	58.3%	58.3%		58.3%	58.3%		41.7%	41.7%		41.7%	41.7%	41.7%
Maximum Green (s)	27.9	27.9		27.9	27.9		17.2	17.2		17.2	17.2	17.2
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.2	1.2		1.2	1.2		1.9	1.9		1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1			7.1		7.8	7.8		7.8	7.8	7.8
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)	27.9	27.9			27.9		17.2	17.2		17.2	17.2	17.2
Actuated g/C Ratio	0.46	0.46			0.46		0.29	0.29		0.29	0.29	0.29
v/c Ratio	0.11	0.26			0.69		0.09	0.44		0.30	0.61	0.08
Control Delay	10.0	10.4			21.0		16.9	17.3		20.8	24.3	2.4
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	10.0	10.4			21.0		16.9	17.3		20.8	24.3	2.4
LOS	A	B			C		B	B		C	C	A
Approach Delay		10.3			21.0			17.3			21.6	
Approach LOS		B			C			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 18.5		Intersection LOS: B	
Intersection Capacity Utilization 92.7%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: County Road 27 & County Road 22



Queues
1: County Road 27 & County Road 22

11/15/2016

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	42	217	513	24	454	74	322	42
v/c Ratio	0.11	0.26	0.69	0.09	0.44	0.30	0.61	0.08
Control Delay	10.0	10.4	21.0	16.9	17.3	20.8	24.3	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.0	10.4	21.0	16.9	17.3	20.8	24.3	2.4
Queue Length 50th (m)	2.6	13.6	51.9	2.0	20.0	6.6	32.0	0.0
Queue Length 95th (m)	7.6	25.8	87.4	6.9	31.8	16.9	55.5	3.2
Internal Link Dist (m)		491.9	1514.1		185.3		281.4	
Turn Bay Length (m)	110.0			130.0		125.0		110.0
Base Capacity (vph)	395	822	748	264	1027	246	528	511
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.26	0.69	0.09	0.44	0.30	0.61	0.08

Intersection Summary

Lanes, Volumes, Timings
2: Gill Road & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	332	8	11	462	16	7	2	7	13	3	3
Future Volume (vph)	10	332	8	11	462	16	7	2	7	13	3	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.9	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.996			0.941			0.980	
Flt Protected		0.999			0.999			0.979			0.966	
Satd. Flow (prot)	0	1818	0	0	1785	0	0	1614	0	0	1707	0
Flt Permitted		0.999			0.999			0.979			0.966	
Satd. Flow (perm)	0	1818	0	0	1785	0	0	1614	0	0	1707	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		1538.1			370.7			296.2			94.4	
Travel Time (s)		69.2			16.7			17.8			6.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	5%	0%	5%	0%	0%	0%	0%	6%	0%	0%
Adj. Flow (vph)	11	349	8	12	486	17	7	2	7	14	3	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	368	0	0	515	0	0	16	0	0	20	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.11	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 40.1% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
2: Gill Road & County Road 22

11/15/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	332	8	11	462	16	7	2	7	13	3	3
Future Volume (Veh/h)	10	332	8	11	462	16	7	2	7	13	3	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	349	8	12	486	17	7	2	7	14	3	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	503			357			898	902	353	902	898	494
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	503			357			898	902	353	902	898	494
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	99			99			97	99	99	94	99	99
cM capacity (veh/h)	1072			1213			255	274	695	247	276	579

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	368	515	16	20
Volume Left	11	12	7	14
Volume Right	8	17	7	3
cSH	1072	1213	357	275
Volume to Capacity	0.01	0.01	0.04	0.07
Queue Length 95th (m)	0.2	0.2	1.1	1.9
Control Delay (s)	0.4	0.3	15.6	19.1
Lane LOS	A	A	C	C
Approach Delay (s)	0.4	0.3	15.6	19.1
Approach LOS			C	C

Intersection Summary					
Average Delay	1.0				
Intersection Capacity Utilization	40.1%	ICU Level of Service		A	
Analysis Period (min)	15				

Lanes, Volumes, Timings
3: Fox Farm Road & County Road 22/Country Road 22

11/15/2016

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	344	6	8	473	7	9
Future Volume (vph)	344	6	8	473	7	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.998				0.924	
Flt Protected				0.999	0.979	
Satd. Flow (prot)	1821	0	0	1803	1700	0
Flt Permitted				0.999	0.979	
Satd. Flow (perm)	1821	0	0	1803	1700	0
Link Speed (k/h)	80			50	80	
Link Distance (m)	153.6			1063.4	320.8	
Travel Time (s)	6.9			76.6	14.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	0%	12%	4%	0%	0%
Adj. Flow (vph)	362	6	8	498	7	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	368	0	0	506	16	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary					
Area Type:	Other				
Control Type: Unsignalized					
Intersection Capacity Utilization	41.3%			ICU Level of Service A	
Analysis Period (min)	15				

HCM Unsignalized Intersection Capacity Analysis
3: Fox Farm Road & County Road 22/Country Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	344	6	8	473	7	9
Future Volume (Veh/h)	344	6	8	473	7	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	362	6	8	498	7	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			368		879	365
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			368		879	365
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			99		98	99
cM capacity (veh/h)			1137		318	685

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	368	506	16
Volume Left	0	8	7
Volume Right	6	0	9
cSH	1700	1137	455
Volume to Capacity	0.22	0.01	0.04
Queue Length 95th (m)	0.0	0.2	0.9
Control Delay (s)	0.0	0.2	13.2
Lane LOS		A	B
Approach Delay (s)	0.0	0.2	13.2
Approach LOS			B

Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization		41.3%	ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings
4: Old Second Road

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	347	7	5	479	14	6	8	8	7	5	3
Future Volume (vph)	3	347	7	5	479	14	6	8	8	7	5	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.996			0.951			0.973	
Flt Protected								0.987			0.977	
Satd. Flow (prot)	0	1781	0	0	1799	0	0	1677	0	0	1634	0
Flt Permitted								0.987			0.977	
Satd. Flow (perm)	0	1781	0	0	1799	0	0	1677	0	0	1634	0
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		1063.4			661.0			398.3			389.2	
Travel Time (s)		76.6			47.6			17.9			17.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	5%	16%	16%	4%	0%	7%	0%	9%	20%	0%	0%
Adj. Flow (vph)	3	365	7	5	504	15	6	8	8	7	5	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	375	0	0	524	0	0	22	0	0	15	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 39.3%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
4: Old Second Road

11/15/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	347	7	5	479	14	6	8	8	7	5	3
Future Volume (Veh/h)	3	347	7	5	479	14	6	8	8	7	5	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	3	365	7	5	504	15	6	8	8	7	5	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	519			372			902	904	368	908	900	512
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	519			372			902	904	368	908	900	512
tC, single (s)	4.1			4.3			7.2	6.5	6.3	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.4	3.7	4.0	3.3
p0 queue free %	100			100			98	97	99	97	98	99
cM capacity (veh/h)	1057			1114			247	277	662	229	278	566

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	375	524	22	15
Volume Left	3	5	6	7
Volume Right	7	15	8	3
cSH	1057	1114	337	279
Volume to Capacity	0.00	0.00	0.07	0.05
Queue Length 95th (m)	0.1	0.1	1.7	1.4
Control Delay (s)	0.1	0.1	16.4	18.7
Lane LOS	A	A	C	C
Approach Delay (s)	0.1	0.1	16.4	18.7
Approach LOS			C	C

Intersection Summary				
Average Delay			0.8	
Intersection Capacity Utilization			39.3%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
5: Country Road 22 & Highway 400 South Ramp

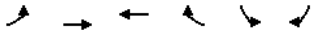
11/15/2016

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	67	295	401	187	5	102
Future Volume (vph)	67	295	401	187	5	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.871	
Flt Protected		0.991			0.998	
Satd. Flow (prot)	0	1781	1824	1581	1600	0
Flt Permitted		0.991			0.998	
Satd. Flow (perm)	0	1781	1824	1581	1600	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		661.0	382.0		499.1	
Travel Time (s)		47.6	27.5		35.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	4%	3%	1%	25%	1%
Adj. Flow (vph)	71	311	422	197	5	107
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	382	422	197	112	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: Country Road 22 & Highway 400 South Ramp

11/15/2016



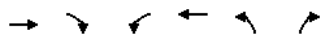
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	67	295	401	187	5	102
Future Volume (Veh/h)	67	295	401	187	5	102
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	71	311	422	197	5	107
Pedestrians						
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	422				875	422
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	422				875	422
tC, single (s)	4.2				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.7	3.3
p0 queue free %	94				98	83
cM capacity (veh/h)	1111				273	634

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	382	422	197	112
Volume Left	71	0	0	5
Volume Right	0	0	197	107
cSH	1111	1700	1700	599
Volume to Capacity	0.06	0.25	0.12	0.19
Queue Length 95th (m)	1.6	0.0	0.0	5.5
Control Delay (s)	2.1	0.0	0.0	12.4
Lane LOS	A			B
Approach Delay (s)	2.1	0.0		12.4
Approach LOS				B

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		

Lanes, Volumes, Timings
6: Highway 400 North Ramp & County Road 22

11/15/2016



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	244	57	16	549	49	131
Future Volume (vph)	244	57	16	549	49	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.999	0.950	
Satd. Flow (prot)	1824	1581	0	1804	1785	1566
Flt Permitted				0.999	0.950	
Satd. Flow (perm)	1824	1581	0	1804	1785	1566
Link Speed (k/h)	50			80	50	
Link Distance (m)	382.0			36.2	392.3	
Travel Time (s)	27.5			1.6	28.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	1%	5%	4%	0%	2%
Adj. Flow (vph)	257	60	17	578	52	138
Shared Lane Traffic (%)						
Lane Group Flow (vph)	257	60	0	595	52	138
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6: Highway 400 North Ramp & County Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	244	57	16	549	49	131
Future Volume (Veh/h)	244	57	16	549	49	131
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	257	60	17	578	52	138
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			257		869	257
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			257		869	257
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		84	82
cM capacity (veh/h)			1290		321	782

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2
Volume Total	257	60	595	52	138
Volume Left	0	0	17	52	0
Volume Right	0	60	0	0	138
cSH	1700	1700	1290	321	782
Volume to Capacity	0.15	0.04	0.01	0.16	0.18
Queue Length 95th (m)	0.0	0.0	0.3	4.6	5.1
Control Delay (s)	0.0	0.0	0.4	18.4	10.6
Lane LOS			A	C	B
Approach Delay (s)	0.0		0.4	12.7	
Approach LOS				B	

Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	51.8%	ICU Level of Service		A
Analysis Period (min)	15			

Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	329	44	41	496	64	70	62	29	45	43	22
Future Volume (vph)	27	329	44	41	496	64	70	62	29	45	43	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	180.0		0.0	185.0		0.0	157.0		0.0	150.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.982			0.983			0.952			0.949	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	1813	0	1733	1774	0	1623	1742	0	1785	1704	0
Flt Permitted	0.291			0.475			0.713			0.695		
Satd. Flow (perm)	541	1813	0	866	1774	0	1218	1742	0	1306	1704	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			14			31			23	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1121.3			305.8			269.5			271.6	
Travel Time (s)		80.7			22.0			19.4			19.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	2%	0%	3%	4%	5%	10%	4%	0%	0%	7%	0%
Adj. Flow (vph)	28	346	46	43	522	67	74	65	31	47	45	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	392	0	43	589	0	74	96	0	47	68	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	24.0	24.0		24.0	24.0		26.0	26.0		26.0	26.0	
Total Split (s)	34.0	34.0		34.0	34.0		26.0	26.0		26.0	26.0	
Total Split (%)	56.7%	56.7%		56.7%	56.7%		43.3%	43.3%		43.3%	43.3%	
Maximum Green (s)	28.0	28.0		28.0	28.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	13.0	13.0		13.0	13.0		15.0	15.0		15.0	15.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	28.0	28.0		28.0	28.0		20.0	20.0		20.0	20.0	
Actuated g/C Ratio	0.47	0.47		0.47	0.47		0.33	0.33		0.33	0.33	

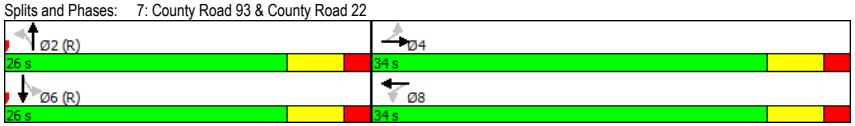
Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.11	0.46		0.11	0.71		0.18	0.16		0.11	0.12	
Control Delay	10.1	12.1		9.9	18.1		15.7	11.2		14.7	10.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	10.1	12.1		9.9	18.1		15.7	11.2		14.7	10.8	
LOS	B	B		A	B		B	B		B	B	
Approach Delay		11.9			17.5			13.2			12.4	
Approach LOS		B			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 14.8		Intersection LOS: B	
Intersection Capacity Utilization 60.7%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 7: County Road 93 & County Road 22



Queues
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	28	392	43	589	74	96	47	68
v/c Ratio	0.11	0.46	0.11	0.71	0.18	0.16	0.11	0.12
Control Delay	10.1	12.1	9.9	18.1	15.7	11.2	14.7	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.1	12.1	9.9	18.1	15.7	11.2	14.7	10.8
Queue Length 50th (m)	1.7	25.9	2.6	49.5	6.0	5.1	3.7	3.5
Queue Length 95th (m)	m5.6	41.4	7.6	84.0	14.6	14.1	10.1	10.9
Internal Link Dist (m)		1097.3		281.8		245.5		247.6
Turn Bay Length (m)	180.0		185.0		157.0		150.0	
Base Capacity (vph)	252	854	404	835	406	601	435	583
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.46	0.11	0.71	0.18	0.16	0.11	0.12

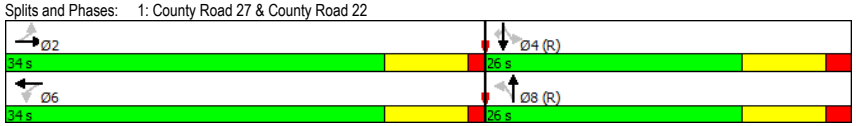
Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	491	16	57	322	121	27	520	158	99	266	66
Future Volume (vph)	57	491	16	57	322	121	27	520	158	99	266	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	110.0		0.0	0.0		0.0	130.0		0.0	125.0		110.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			0.0			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.995			0.967			0.965				0.850
Flt Protected	0.950				0.994		0.950			0.950		
Satd. Flow (prot)	1767	1776	0	0	1713	0	1700	3445	0	1668	1842	1597
Flt Permitted	0.438				0.803		0.588			0.313		
Satd. Flow (perm)	815	1776	0	0	1384	0	1052	3445	0	550	1842	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			35			68				75
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		515.9			1538.1			209.3			305.4	
Travel Time (s)		23.2			69.2			9.4			13.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	5%	13%	8%	7%	0%	5%	0%	0%	7%	2%	0%
Adj. Flow (vph)	60	517	17	60	339	127	28	547	166	104	280	69
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	534	0	0	526	0	28	713	0	104	280	69
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		4
Minimum Split (s)	27.8	27.8		27.8	27.8		17.8	17.8		17.8	17.8	17.8
Total Split (s)	34.0	34.0		34.0	34.0		26.0	26.0		26.0	26.0	26.0
Total Split (%)	56.7%	56.7%		56.7%	56.7%		43.3%	43.3%		43.3%	43.3%	43.3%
Maximum Green (s)	26.9	26.9		26.9	26.9		18.2	18.2		18.2	18.2	18.2
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.2	1.2		1.2	1.2		1.9	1.9		1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1			7.1		7.8	7.8		7.8	7.8	7.8
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)	26.9	26.9			26.9		18.2	18.2		18.2	18.2	18.2
Actuated g/C Ratio	0.45	0.45			0.45		0.30	0.30		0.30	0.30	0.30
v/c Ratio	0.16	0.67			0.82		0.09	0.65		0.63	0.50	0.13
Control Delay	11.4	18.1			30.1		16.0	19.7		38.9	21.0	4.9
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	11.4	18.1			30.1		16.0	19.7		38.9	21.0	4.9
LOS	B	B			C		B	B		D	C	A
Approach Delay		17.4			30.1			19.5			22.6	
Approach LOS		B			C			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.82			
Intersection Signal Delay: 22.0		Intersection LOS: C	
Intersection Capacity Utilization 106.9%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 1: County Road 27 & County Road 22



Queues
1: County Road 27 & County Road 22

11/15/2016

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	60	534	526	28	713	104	280	69
v/c Ratio	0.16	0.67	0.82	0.09	0.65	0.63	0.50	0.13
Control Delay	11.4	18.1	30.1	16.0	19.7	38.9	21.0	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.4	18.1	30.1	16.0	19.7	38.9	21.0	4.9
Queue Length 50th (m)	3.9	45.6	59.9	2.3	33.4	10.2	26.3	0.0
Queue Length 95th (m)	10.5	76.8	m#103.0	7.5	50.1	#31.8	46.5	7.0
Internal Link Dist (m)		491.9	1514.1		185.3		281.4	
Turn Bay Length (m)	110.0			130.0		125.0		110.0
Base Capacity (vph)	365	798	639	319	1092	166	558	536
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.67	0.82	0.09	0.65	0.63	0.50	0.13

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
2: Gill Road & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	762	10	10	540	17	3	2	2	18	1	18
Future Volume (vph)	21	762	10	10	540	17	3	2	2	18	1	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.9	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.996			0.961			0.934	
Flt Protected		0.999			0.999			0.979			0.976	
Satd. Flow (prot)	0	1820	0	0	1785	0	0	1649	0	0	1664	0
Flt Permitted		0.999			0.999			0.979			0.976	
Satd. Flow (perm)	0	1820	0	0	1785	0	0	1649	0	0	1664	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		1538.1			370.7			296.2			94.4	
Travel Time (s)		69.2			16.7			17.8			6.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	5%	0%	5%	0%	0%	0%	0%	6%	0%	0%
Adj. Flow (vph)	22	802	11	11	568	18	3	2	2	19	1	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	835	0	0	597	0	0	7	0	0	39	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.11	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 61.9% ICU Level of Service B
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
2: Gill Road & County Road 22

11/15/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	762	10	10	540	17	3	2	2	18	1	18
Future Volume (Veh/h)	21	762	10	10	540	17	3	2	2	18	1	18
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	22	802	11	11	568	18	3	2	2	19	1	19
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	586			813			1470	1460	808	1454	1456	577
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	586			813			1470	1460	808	1454	1456	577
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	98			99			97	98	99	81	99	96
cM capacity (veh/h)	999			823			99	126	384	101	126	520

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	835	597	7	39
Volume Left	22	11	3	19
Volume Right	11	18	2	19
cSH	999	823	136	168
Volume to Capacity	0.02	0.01	0.05	0.23
Queue Length 95th (m)	0.5	0.3	1.3	6.9
Control Delay (s)	0.6	0.4	32.8	32.8
Lane LOS	A	A	D	D
Approach Delay (s)	0.6	0.4	32.8	32.8
Approach LOS			D	D

Intersection Summary				
Average Delay			1.5	
Intersection Capacity Utilization			61.9%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
3: Fox Farm Road & County Road 22/Country Road 22

11/15/2016

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	795	8	11	567	5	10
Future Volume (vph)	795	8	11	567	5	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999				0.907	
Flt Protected				0.999	0.985	
Satd. Flow (prot)	1823	0	0	1802	1679	0
Flt Permitted				0.999	0.985	
Satd. Flow (perm)	1823	0	0	1802	1679	0
Link Speed (k/h)	80			50	80	
Link Distance (m)	153.6			1063.4	320.8	
Travel Time (s)	6.9			76.6	14.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	0%	12%	4%	0%	0%
Adj. Flow (vph)	837	8	12	597	5	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	845	0	0	609	16	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	52.3%	ICU Level of Service A	
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Fox Farm Road & County Road 22/Country Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	795	8	11	567	5	10
Future Volume (Veh/h)	795	8	11	567	5	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	837	8	12	597	5	11
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			845		1462	841
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			845		1462	841
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			98		96	97
cM capacity (veh/h)			750		141	368

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	845	609	16
Volume Left	0	12	5
Volume Right	8	0	11
cSH	1700	750	245
Volume to Capacity	0.50	0.02	0.07
Queue Length 95th (m)	0.0	0.4	1.7
Control Delay (s)	0.0	0.4	20.7
Lane LOS		A	C
Approach Delay (s)	0.0	0.4	20.7
Approach LOS			C

Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization		52.3%	ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings
4: Old Second Road

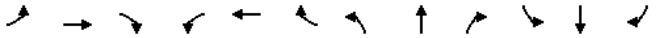
11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	795	8	7	558	23	5	16	9	14	5	6
Future Volume (vph)	4	795	8	7	558	23	5	16	9	14	5	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.995			0.961			0.969	
Flt Protected					0.999			0.992			0.972	
Satd. Flow (prot)	0	1786	0	0	1796	0	0	1727	0	0	1587	0
Flt Permitted					0.999			0.992			0.972	
Satd. Flow (perm)	0	1786	0	0	1796	0	0	1727	0	0	1587	0
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		1063.4			661.0			398.3			389.2	
Travel Time (s)		76.6			47.6			17.9			17.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	5%	16%	16%	4%	0%	7%	0%	9%	20%	0%	0%
Adj. Flow (vph)	4	837	8	7	587	24	5	17	9	15	5	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	849	0	0	618	0	0	31	0	0	26	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 55.0%		ICU Level of Service B	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
4: Old Second Road

11/15/2016



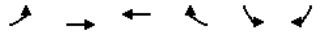
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	795	8	7	558	23	5	16	9	14	5	6
Future Volume (Veh/h)	4	795	8	7	558	23	5	16	9	14	5	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	837	8	7	587	24	5	17	9	15	5	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	611			845			1470	1474	841	1480	1466	599
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	611			845			1470	1474	841	1480	1466	599
tC, single (s)	4.1			4.3			7.2	6.5	6.3	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.4	3.7	4.0	3.3
p0 queue free %	100			99			95	87	97	82	96	99
cM capacity (veh/h)	978			735			97	126	354	82	127	505

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	849	618	31	26
Volume Left	4	7	5	15
Volume Right	8	24	9	6
cSH	978	735	146	111
Volume to Capacity	0.00	0.01	0.21	0.23
Queue Length 95th (m)	0.1	0.2	6.1	6.8
Control Delay (s)	0.1	0.3	36.1	47.2
Lane LOS	A	A	E	E
Approach Delay (s)	0.1	0.3	36.1	47.2
Approach LOS			E	E

Intersection Summary				
Average Delay			1.7	
Intersection Capacity Utilization			55.0%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
5: Country Road 22 & Highway 400 South Ramp

11/15/2016

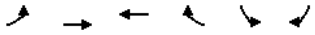


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	77	728	487	123	11	99
Future Volume (vph)	77	728	487	123	11	99
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.879	
Flt Protected		0.995			0.995	
Satd. Flow (prot)	0	1793	1824	1581	1588	0
Flt Permitted		0.995			0.995	
Satd. Flow (perm)	0	1793	1824	1581	1588	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		661.0	382.0		499.1	
Travel Time (s)		47.6	27.5		35.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	4%	3%	1%	25%	1%
Adj. Flow (vph)	81	766	513	129	12	104
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	847	513	129	116	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	84.9%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: Country Road 22 & Highway 400 South Ramp

11/15/2016



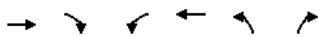
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	77	728	487	123	11	99
Future Volume (Veh/h)	77	728	487	123	11	99
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	81	766	513	129	12	104
Pedestrians						
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	513				1441	513
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	513				1441	513
tC, single (s)	4.2				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.7	3.3
p0 queue free %	92				90	82
cM capacity (veh/h)	1027				120	563

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	847	513	129	116
Volume Left	81	0	0	12
Volume Right	0	0	129	104
cSH	1027	1700	1700	407
Volume to Capacity	0.08	0.30	0.08	0.28
Queue Length 95th (m)	2.0	0.0	0.0	9.3
Control Delay (s)	2.0	0.0	0.0	17.3
Lane LOS	A			C
Approach Delay (s)	2.0	0.0		17.3
Approach LOS				C

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	84.9%	ICU Level of Service	E
Analysis Period (min)	15		

Lanes, Volumes, Timings
6: Highway 400 North Ramp & County Road 22

11/15/2016



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	491	241	30	506	86	265
Future Volume (vph)	491	241	30	506	86	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.997	0.950	
Satd. Flow (prot)	1824	1581	0	1800	1785	1566
Flt Permitted				0.997	0.950	
Satd. Flow (perm)	1824	1581	0	1800	1785	1566
Link Speed (k/h)	50			80	50	
Link Distance (m)	382.0			36.2	392.3	
Travel Time (s)	27.5			1.6	28.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	1%	5%	4%	0%	2%
Adj. Flow (vph)	517	254	32	533	91	279
Shared Lane Traffic (%)						
Lane Group Flow (vph)	517	254	0	565	91	279
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6: Highway 400 North Ramp & County Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	491	241	30	506	86	265
Future Volume (Veh/h)	491	241	30	506	86	265
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	517	254	32	533	91	279
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			517		1114	517
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			517		1114	517
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		60	50
cM capacity (veh/h)			1034		225	558

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2
Volume Total	517	254	565	91	279
Volume Left	0	0	32	91	0
Volume Right	0	254	0	0	279
cSH	1700	1700	1034	225	558
Volume to Capacity	0.30	0.15	0.03	0.40	0.50
Queue Length 95th (m)	0.0	0.0	0.8	14.7	22.2
Control Delay (s)	0.0	0.0	0.9	31.4	17.7
Lane LOS			A	D	C
Approach Delay (s)	0.0		0.9	21.1	
Approach LOS				C	

Intersection Summary			
Average Delay	4.9		
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		

Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	660	68	41	486	91	69	113	98	69	55	29
Future Volume (vph)	53	660	68	41	486	91	69	113	98	69	55	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	180.0		0.0	185.0		0.0	157.0		0.0	150.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.986			0.976			0.930			0.948	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	1820	0	1733	1761	0	1623	1711	0	1785	1703	0
Flt Permitted	0.274			0.143			0.699			0.620		
Satd. Flow (perm)	510	1820	0	261	1761	0	1194	1711	0	1165	1703	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			21			78			31	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1121.3			305.8			269.5			271.6	
Travel Time (s)		80.7			22.0			19.4			19.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	2%	0%	3%	4%	5%	10%	4%	0%	0%	7%	0%
Adj. Flow (vph)	56	695	72	43	512	96	73	119	103	73	58	31
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	767	0	43	608	0	73	222	0	73	89	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	24.0	24.0		24.0	24.0		26.0	26.0		26.0	26.0	
Total Split (s)	34.0	34.0		34.0	34.0		26.0	26.0		26.0	26.0	
Total Split (%)	56.7%	56.7%		56.7%	56.7%		43.3%	43.3%		43.3%	43.3%	
Maximum Green (s)	28.0	28.0		28.0	28.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	13.0	13.0		13.0	13.0		15.0	15.0		15.0	15.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	28.0	28.0		28.0	28.0		20.0	20.0		20.0	20.0	
Actuated g/C Ratio	0.47	0.47		0.47	0.47		0.33	0.33		0.33	0.33	

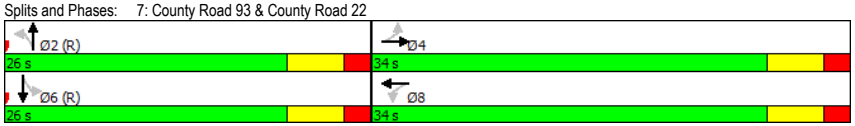
Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.24	0.90		0.36	0.73		0.18	0.36		0.19	0.15	
Control Delay	11.1	28.1		20.5	19.0		15.8	11.6		15.9	10.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	11.1	28.1		20.5	19.0		15.8	11.6		15.9	10.9	
LOS	B	C		C	B		B	B		B	B	
Approach Delay		27.0			19.1			12.7			13.1	
Approach LOS		C			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 21.0		Intersection LOS: C	
Intersection Capacity Utilization 92.4%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 7: County Road 93 & County Road 22



Queues
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	56	767	43	608	73	222	73	89
v/c Ratio	0.24	0.90	0.36	0.73	0.18	0.36	0.19	0.15
Control Delay	11.1	28.1	20.5	19.0	15.8	11.6	15.9	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.1	28.1	20.5	19.0	15.8	11.6	15.9	10.9
Queue Length 50th (m)	3.2	55.1	3.0	51.4	5.9	11.9	5.9	4.6
Queue Length 95th (m)	m7.0	#142.7	11.7	88.1	14.4	27.0	14.4	13.1
Internal Link Dist (m)		1097.3		281.8		245.5		247.6
Turn Bay Length (m)	180.0		185.0		157.0		150.0	
Base Capacity (vph)	238	855	121	833	398	622	388	588
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.90	0.36	0.73	0.18	0.36	0.19	0.15

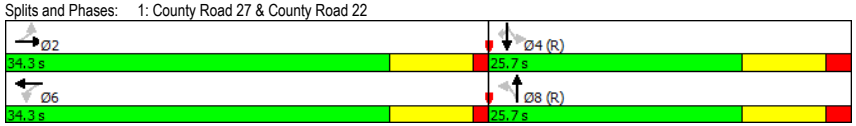
Intersection Summary	
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.
m	Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	349	23	69	312	134	17	447	147	100	344	33
Future Volume (vph)	56	349	23	69	312	134	17	447	147	100	344	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	110.0		0.0	0.0		0.0	130.0		0.0	125.0		110.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			0.0			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.991			0.965			0.963				0.850
Flt Protected	0.950				0.993		0.950			0.950		
Satd. Flow (prot)	1767	1765	0	0	1710	0	1700	3438	0	1668	1842	1597
Flt Permitted	0.433				0.889		0.460			0.377		
Satd. Flow (perm)	806	1765	0	0	1531	0	823	3438	0	662	1842	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			39			76				75
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		515.9			1538.1			209.3			305.4	
Travel Time (s)		23.2			69.2			9.4			13.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	5%	13%	8%	7%	0%	5%	0%	0%	7%	2%	0%
Adj. Flow (vph)	59	367	24	73	328	141	18	471	155	105	362	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	59	391	0	0	542	0	18	626	0	105	362	35
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		4
Minimum Split (s)	27.8	27.8		27.8	27.8		17.8	17.8		17.8	17.8	17.8
Total Split (s)	34.3	34.3		34.3	34.3		25.7	25.7		25.7	25.7	25.7
Total Split (%)	57.2%	57.2%		57.2%	57.2%		42.8%	42.8%		42.8%	42.8%	42.8%
Maximum Green (s)	27.2	27.2		27.2	27.2		17.9	17.9		17.9	17.9	17.9
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.2	1.2		1.2	1.2		1.9	1.9		1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1			7.1		7.8	7.8		7.8	7.8	7.8
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)	27.2	27.2			27.2		17.9	17.9		17.9	17.9	17.9
Actuated g/C Ratio	0.45	0.45			0.45		0.30	0.30		0.30	0.30	0.30
v/c Ratio	0.16	0.49			0.76		0.07	0.58		0.53	0.66	0.07
Control Delay	11.2	13.9			24.9		16.2	18.1		29.9	25.2	1.7
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	11.2	13.9			24.9		16.2	18.1		29.9	25.2	1.7
LOS	B	B			C		B	B		C	C	A
Approach Delay		13.5			24.9			18.1			24.5	
Approach LOS		B			C			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green			
Natural Cycle: 55			
Control Type: Pretimed			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 20.4		Intersection LOS: C	
Intersection Capacity Utilization 99.4%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: County Road 27 & County Road 22



Queues
1: County Road 27 & County Road 22

11/15/2016

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	59	391	542	18	626	105	362	35
v/c Ratio	0.16	0.49	0.76	0.07	0.58	0.53	0.66	0.07
Control Delay	11.2	13.9	24.9	16.2	18.1	29.9	25.2	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.2	13.9	24.9	16.2	18.1	29.9	25.2	1.7
Queue Length 50th (m)	3.8	29.3	60.1	1.5	27.7	10.0	36.2	0.0
Queue Length 95th (m)	10.2	50.6	m#98.3	5.7	42.8	#28.2	62.0	2.0
Internal Link Dist (m)		491.9	1514.1		185.3		281.4	
Turn Bay Length (m)	110.0			130.0		125.0		110.0
Base Capacity (vph)	365	803	715	245	1078	197	549	529
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.49	0.76	0.07	0.58	0.53	0.66	0.07

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
2: Gill Road & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	587	18	14	504	10	11	3	9	15	0	12
Future Volume (vph)	13	587	18	14	504	10	11	3	9	15	0	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.9	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.997			0.949			0.939	
Flt Protected		0.999			0.999			0.976			0.973	
Satd. Flow (prot)	0	1815	0	0	1786	0	0	1623	0	0	1662	0
Flt Permitted		0.999			0.999			0.976			0.973	
Satd. Flow (perm)	0	1815	0	0	1786	0	0	1623	0	0	1662	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		1538.1			370.7			296.2			94.4	
Travel Time (s)		69.2			16.7			17.8			6.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	5%	0%	5%	0%	0%	0%	0%	6%	0%	0%
Adj. Flow (vph)	14	618	19	15	531	11	12	3	9	16	0	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	651	0	0	557	0	0	24	0	0	29	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.11	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 47.9% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
2: Gill Road & County Road 22

11/15/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	587	18	14	504	10	11	3	9	15	0	12
Future Volume (Veh/h)	13	587	18	14	504	10	11	3	9	15	0	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	14	618	19	15	531	11	12	3	9	16	0	13
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	542			637			1235	1228	628	1232	1232	536
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	542			637			1235	1228	628	1232	1232	536
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	99			98			92	98	98	89	100	98
cM capacity (veh/h)	1037			956			148	175	487	143	174	548

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	651	557	24	29
Volume Left	14	15	12	16
Volume Right	19	11	9	13
cSH	1037	956	205	214
Volume to Capacity	0.01	0.02	0.12	0.14
Queue Length 95th (m)	0.3	0.4	3.1	3.7
Control Delay (s)	0.4	0.4	24.9	24.5
Lane LOS	A	A	C	C
Approach Delay (s)	0.4	0.4	24.9	24.5
Approach LOS			C	C

Intersection Summary				
Average Delay			1.4	
Intersection Capacity Utilization			47.9%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
3: Fox Farm Road & County Road 22/Country Road 22

11/15/2016

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	606	11	13	522	3	6
Future Volume (vph)	606	11	13	522	3	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.998				0.910	
Flt Protected				0.999	0.984	
Satd. Flow (prot)	1821	0	0	1801	1682	0
Flt Permitted				0.999	0.984	
Satd. Flow (perm)	1821	0	0	1801	1682	0
Link Speed (k/h)	80			50	80	
Link Distance (m)	153.6			1063.4	320.8	
Travel Time (s)	6.9			76.6	14.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	0%	12%	4%	0%	0%
Adj. Flow (vph)	638	12	14	549	3	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	650	0	0	563	9	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	47.9%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Fox Farm Road & County Road 22/Country Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	606	11	13	522	3	6
Future Volume (Veh/h)	606	11	13	522	3	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	638	12	14	549	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			650		1221	644
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			650		1221	644
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			98		98	99
cM capacity (veh/h)			890		197	476

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	650	563	9
Volume Left	0	14	3
Volume Right	12	0	6
cSH	1700	890	324
Volume to Capacity	0.38	0.02	0.03
Queue Length 95th (m)	0.0	0.4	0.7
Control Delay (s)	0.0	0.4	16.4
Lane LOS		A	C
Approach Delay (s)	0.0	0.4	16.4
Approach LOS			C

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	47.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
4: Old Second Road

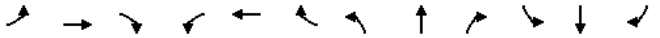
11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	582	12	6	512	48	14	24	11	10	9	5
Future Volume (vph)	13	582	12	6	512	48	14	24	11	10	9	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.988			0.969			0.973	
Flt Protected		0.999			0.999			0.986			0.978	
Satd. Flow (prot)	0	1780	0	0	1787	0	0	1725	0	0	1643	0
Flt Permitted		0.999			0.999			0.986			0.978	
Satd. Flow (perm)	0	1780	0	0	1787	0	0	1725	0	0	1643	0
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		1063.4			661.0			398.3			389.2	
Travel Time (s)		76.6			47.6			17.9			17.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	5%	16%	16%	4%	0%	7%	0%	9%	20%	0%	0%
Adj. Flow (vph)	14	613	13	6	539	51	15	25	12	11	9	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	640	0	0	596	0	0	52	0	0	25	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	49.3%	ICU Level of Service A	
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
4: Old Second Road

11/15/2016



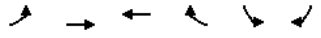
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	582	12	6	512	48	14	24	11	10	9	5
Future Volume (Veh/h)	13	582	12	6	512	48	14	24	11	10	9	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	14	613	13	6	539	51	15	25	12	11	9	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	590			626			1234	1250	620	1248	1230	564
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	590			626			1234	1250	620	1248	1230	564
tC, single (s)	4.1			4.3			7.2	6.5	6.3	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.4	3.7	4.0	3.3
p0 queue free %	99			99			89	85	97	91	95	99
cM capacity (veh/h)	995			892			140	171	476	117	175	529

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	640	596	52	25
Volume Left	14	6	15	11
Volume Right	13	51	12	5
cSH	995	892	187	162
Volume to Capacity	0.01	0.01	0.28	0.15
Queue Length 95th (m)	0.3	0.2	8.7	4.3
Control Delay (s)	0.4	0.2	31.5	31.3
Lane LOS	A	A	D	D
Approach Delay (s)	0.4	0.2	31.5	31.3
Approach LOS			D	D

Intersection Summary				
Average Delay			2.1	
Intersection Capacity Utilization			49.3%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
5: Country Road 22 & Highway 400 South Ramp

11/15/2016

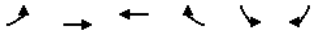


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	98	505	471	160	7	98
Future Volume (vph)	98	505	471	160	7	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.874	
Flt Protected		0.992			0.997	
Satd. Flow (prot)	0	1784	1824	1581	1597	0
Flt Permitted		0.992			0.997	
Satd. Flow (perm)	0	1784	1824	1581	1597	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		661.0	382.0		499.1	
Travel Time (s)		47.6	27.5		35.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	4%	3%	1%	25%	1%
Adj. Flow (vph)	103	532	496	168	7	103
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	635	496	168	110	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	73.2%	ICU Level of Service D	
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: Country Road 22 & Highway 400 South Ramp

11/15/2016



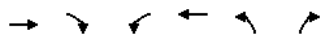
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	98	505	471	160	7	98
Future Volume (Veh/h)	98	505	471	160	7	98
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	103	532	496	168	7	103
Pedestrians						
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	496				1234	496
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	496				1234	496
tC, single (s)	4.2				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.7	3.3
p0 queue free %	90				96	82
cM capacity (veh/h)	1042				158	576

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	635	496	168	110
Volume Left	103	0	0	7
Volume Right	0	0	168	103
cSH	1042	1700	1700	493
Volume to Capacity	0.10	0.29	0.10	0.22
Queue Length 95th (m)	2.6	0.0	0.0	6.8
Control Delay (s)	2.5	0.0	0.0	14.4
Lane LOS	A			B
Approach Delay (s)	2.5	0.0		14.4
Approach LOS				B

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	73.2%	ICU Level of Service	D
Analysis Period (min)	15		

Lanes, Volumes, Timings
6: Highway 400 North Ramp & County Road 22

11/15/2016



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	413	95	28	516	109	293
Future Volume (vph)	413	95	28	516	109	293
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.997	0.950	
Satd. Flow (prot)	1824	1581	0	1800	1785	1566
Flt Permitted				0.997	0.950	
Satd. Flow (perm)	1824	1581	0	1800	1785	1566
Link Speed (k/h)	50			80	50	
Link Distance (m)	382.0			36.2	392.3	
Travel Time (s)	27.5			1.6	28.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	1%	5%	4%	0%	2%
Adj. Flow (vph)	435	100	29	543	115	308
Shared Lane Traffic (%)						
Lane Group Flow (vph)	435	100	0	572	115	308
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	62.7%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6: Highway 400 North Ramp & County Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	413	95	28	516	109	293
Future Volume (Veh/h)	413	95	28	516	109	293
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	435	100	29	543	115	308
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			435		1036	435
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			435		1036	435
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		54	50
cM capacity (veh/h)			1109		252	621

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2
Volume Total	435	100	572	115	308
Volume Left	0	0	29	115	0
Volume Right	0	100	0	0	308
cSH	1700	1700	1109	252	621
Volume to Capacity	0.26	0.06	0.03	0.46	0.50
Queue Length 95th (m)	0.0	0.0	0.6	17.8	22.1
Control Delay (s)	0.0	0.0	0.7	30.7	16.4
Lane LOS			A	D	C
Approach Delay (s)	0.0		0.7	20.3	
Approach LOS				C	

Intersection Summary				
Average Delay	5.9			
Intersection Capacity Utilization	62.7%	ICU Level of Service		B
Analysis Period (min)	15			

Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	605	69	47	466	110	29	94	140	65	70	40
Future Volume (vph)	64	605	69	47	466	110	29	94	140	65	70	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	180.0		0.0	185.0		0.0	157.0		0.0	150.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.985			0.971			0.910			0.946	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	1818	0	1733	1751	0	1623	1683	0	1785	1701	0
Flt Permitted	0.275			0.186			0.682			0.596		
Satd. Flow (perm)	512	1818	0	339	1751	0	1165	1683	0	1120	1701	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			27			134			42	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1121.3			305.8			269.5			271.6	
Travel Time (s)		80.7			22.0			19.4			19.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	2%	0%	3%	4%	5%	10%	4%	0%	0%	7%	0%
Adj. Flow (vph)	67	637	73	49	491	116	31	99	147	68	74	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	710	0	49	607	0	31	246	0	68	116	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	24.0	24.0		24.0	24.0		26.0	26.0		26.0	26.0	
Total Split (s)	34.0	34.0		34.0	34.0		26.0	26.0		26.0	26.0	
Total Split (%)	56.7%	56.7%		56.7%	56.7%		43.3%	43.3%		43.3%	43.3%	
Maximum Green (s)	28.0	28.0		28.0	28.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	13.0	13.0		13.0	13.0		15.0	15.0		15.0	15.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	28.0	28.0		28.0	28.0		20.0	20.0		20.0	20.0	
Actuated g/C Ratio	0.47	0.47		0.47	0.47		0.33	0.33		0.33	0.33	

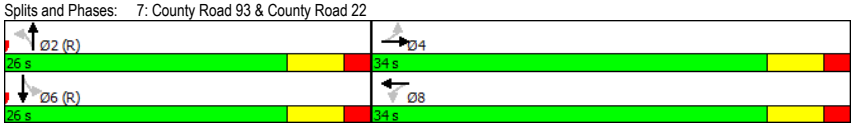
Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.28	0.83		0.31	0.73		0.08	0.38		0.18	0.19	
Control Delay	12.5	23.5		16.7	18.9		14.5	9.2		15.8	10.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	12.5	23.5		16.7	18.9		14.5	9.2		15.8	10.8	
LOS	B	C		B	B		B	A		B	B	
Approach Delay		22.6			18.7			9.8			12.7	
Approach LOS		C			B			A			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 18.4		Intersection LOS: B	
Intersection Capacity Utilization 101.5%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 7: County Road 93 & County Road 22



Queues
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	67	710	49	607	31	246	68	116
v/c Ratio	0.28	0.83	0.31	0.73	0.08	0.38	0.18	0.19
Control Delay	12.5	23.5	16.7	18.9	14.5	9.2	15.8	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.5	23.5	16.7	18.9	14.5	9.2	15.8	10.8
Queue Length 50th (m)	4.2	57.9	3.3	50.9	2.4	9.1	5.5	5.9
Queue Length 95th (m)	m9.9	#130.6	11.3	87.4	7.6	24.2	13.7	15.8
Internal Link Dist (m)		1097.3		281.8		245.5		247.6
Turn Bay Length (m)	180.0		185.0		157.0		150.0	
Base Capacity (vph)	238	855	158	831	388	650	373	595
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.83	0.31	0.73	0.08	0.38	0.18	0.19

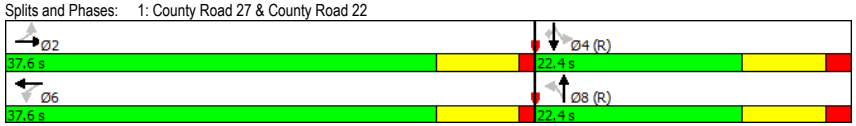
Intersection Summary	
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.
m	Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	209	17	93	379	139	23	353	84	75	306	40
Future Volume (vph)	40	209	17	93	379	139	23	353	84	75	306	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	110.0		0.0	0.0		0.0	130.0		0.0	125.0		110.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			0.0			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.989			0.969			0.971				0.850
Flt Protected	0.950				0.992		0.950			0.950		
Satd. Flow (prot)	1767	1760	0	0	1711	0	1700	3466	0	1668	1842	1597
Flt Permitted	0.403				0.904		0.485			0.487		
Satd. Flow (perm)	750	1760	0	0	1559	0	868	3466	0	855	1842	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			36			45				75
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		515.9			1538.1			209.3			305.4	
Travel Time (s)		23.2			69.2			9.4			13.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	5%	13%	8%	7%	0%	5%	0%	0%	7%	2%	0%
Adj. Flow (vph)	42	220	18	98	399	146	24	372	88	79	322	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	238	0	0	643	0	24	460	0	79	322	42
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		4
Minimum Split (s)	27.8	27.8		27.8	27.8		17.8	17.8		17.8	17.8	17.8
Total Split (s)	37.6	37.6		37.6	37.6		22.4	22.4		22.4	22.4	22.4
Total Split (%)	62.7%	62.7%		62.7%	62.7%		37.3%	37.3%		37.3%	37.3%	37.3%
Maximum Green (s)	30.5	30.5		30.5	30.5		14.6	14.6		14.6	14.6	14.6
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.2	1.2		1.2	1.2		1.9	1.9		1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1			7.1		7.8	7.8		7.8	7.8	7.8
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)	30.5	30.5			30.5		14.6	14.6		14.6	14.6	14.6
Actuated g/C Ratio	0.51	0.51			0.51		0.24	0.24		0.24	0.24	0.24
v/c Ratio	0.11	0.26			0.79		0.11	0.52		0.38	0.72	0.09
Control Delay	8.7	9.0			23.2		19.4	20.2		25.3	32.0	2.8
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	8.7	9.0			23.2		19.4	20.2		25.3	32.0	2.8
LOS	A	A			C		B	C		C	C	A
Approach Delay		8.9			23.2			20.2			28.1	
Approach LOS		A			C			C			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 21.4		Intersection LOS: C	
Intersection Capacity Utilization 99.5%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: County Road 27 & County Road 22



Queues
1: County Road 27 & County Road 22

11/15/2016

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	42	238	643	24	460	79	322	42
v/c Ratio	0.11	0.26	0.79	0.11	0.52	0.38	0.72	0.09
Control Delay	8.7	9.0	23.2	19.4	20.2	25.3	32.0	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.7	9.0	23.2	19.4	20.2	25.3	32.0	2.8
Queue Length 50th (m)	2.3	13.7	75.7	2.2	21.7	7.6	34.2	0.0
Queue Length 95th (m)	7.0	25.5	m89.8	7.4	34.6	19.0	#67.7	3.4
Internal Link Dist (m)		491.9	1514.1		185.3		281.4	
Turn Bay Length (m)	110.0			130.0		125.0		110.0
Base Capacity (vph)	381	899	810	211	877	208	448	445
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.26	0.79	0.11	0.52	0.38	0.72	0.09

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
2: Gill Road & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	368	8	11	589	16	7	2	7	13	3	3
Future Volume (vph)	10	368	8	11	589	16	7	2	7	13	3	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.9	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.996			0.941			0.980	
Flt Protected		0.999			0.999			0.979			0.966	
Satd. Flow (prot)	0	1818	0	0	1784	0	0	1614	0	0	1707	0
Flt Permitted		0.999			0.999			0.979			0.966	
Satd. Flow (perm)	0	1818	0	0	1784	0	0	1614	0	0	1707	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		1538.1			370.7			296.2			94.4	
Travel Time (s)		69.2			16.7			17.8			6.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	5%	0%	5%	0%	0%	0%	0%	6%	0%	0%
Adj. Flow (vph)	11	387	8	12	620	17	7	2	7	14	3	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	406	0	0	649	0	0	16	0	0	20	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.11	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 47.0% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
2: Gill Road & County Road 22

11/15/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	368	8	11	589	16	7	2	7	13	3	3
Future Volume (Veh/h)	10	368	8	11	589	16	7	2	7	13	3	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	387	8	12	620	17	7	2	7	14	3	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	637			395			1070	1074	391	1074	1070	628
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	637			395			1070	1074	391	1074	1070	628
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	99			99			96	99	99	93	99	99
cM capacity (veh/h)	956			1175			194	217	662	188	218	486

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	406	649	16	20
Volume Left	11	12	7	14
Volume Right	8	17	7	3
cSH	956	1175	286	212
Volume to Capacity	0.01	0.01	0.06	0.09
Queue Length 95th (m)	0.3	0.2	1.4	2.5
Control Delay (s)	0.4	0.3	18.3	23.8
Lane LOS	A	A	C	C
Approach Delay (s)	0.4	0.3	18.3	23.8
Approach LOS			C	C

Intersection Summary					
Average Delay			1.0		
Intersection Capacity Utilization			47.0%	ICU Level of Service	A
Analysis Period (min)			15		

Lanes, Volumes, Timings
3: Fox Farm Road & County Road 22/Country Road 22

11/15/2016

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	380	6	8	601	7	9
Future Volume (vph)	380	6	8	601	7	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.998				0.924	
Flt Protected				0.999	0.979	
Satd. Flow (prot)	1821	0	0	1803	1700	0
Flt Permitted				0.999	0.979	
Satd. Flow (perm)	1821	0	0	1803	1700	0
Link Speed (k/h)	80			50	80	
Link Distance (m)	153.6			1063.4	320.8	
Travel Time (s)	6.9			76.6	14.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	0%	12%	4%	0%	0%
Adj. Flow (vph)	400	6	8	633	7	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	406	0	0	641	16	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary				
Area Type:	Other			
Control Type: Unsignalized				
Intersection Capacity Utilization	48.0%		ICU Level of Service A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
3: Fox Farm Road & County Road 22/Country Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	380	6	8	601	7	9
Future Volume (Veh/h)	380	6	8	601	7	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	400	6	8	633	7	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			406		1052	403
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			406		1052	403
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			99		97	99
cM capacity (veh/h)			1101		251	652

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	406	641	16
Volume Left	0	8	7
Volume Right	6	0	9
cSH	1700	1101	384
Volume to Capacity	0.24	0.01	0.04
Queue Length 95th (m)	0.0	0.2	1.0
Control Delay (s)	0.0	0.2	14.8
Lane LOS		A	B
Approach Delay (s)	0.0	0.2	14.8
Approach LOS			B

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		48.0%	ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings
4: Old Second Road

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	383	7	5	607	14	6	8	8	7	5	3
Future Volume (vph)	3	383	7	5	607	14	6	8	8	7	5	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.997			0.951			0.973	
Flt Protected								0.987			0.977	
Satd. Flow (prot)	0	1783	0	0	1801	0	0	1677	0	0	1634	0
Flt Permitted								0.987			0.977	
Satd. Flow (perm)	0	1783	0	0	1801	0	0	1677	0	0	1634	0
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		1063.4			661.0			398.3			389.2	
Travel Time (s)		76.6			47.6			17.9			17.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	5%	16%	16%	4%	0%	7%	0%	9%	20%	0%	0%
Adj. Flow (vph)	3	403	7	5	639	15	6	8	8	7	5	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	413	0	0	659	0	0	22	0	0	15	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	46.1%	ICU Level of Service A	
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
4: Old Second Road

11/15/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	383	7	5	607	14	6	8	8	7	5	3
Future Volume (Veh/h)	3	383	7	5	607	14	6	8	8	7	5	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	3	403	7	5	639	15	6	8	8	7	5	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	654			410			1074	1076	406	1081	1072	646
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	654			410			1074	1076	406	1081	1072	646
tC, single (s)	4.1			4.3			7.2	6.5	6.3	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.4	3.7	4.0	3.3
p0 queue free %	100			100			97	96	99	96	98	99
cM capacity (veh/h)	943			1077			187	219	630	172	220	475

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	413	659	22	15
Volume Left	3	5	6	7
Volume Right	7	15	8	3
cSH	943	1077	271	215
Volume to Capacity	0.00	0.00	0.08	0.07
Queue Length 95th (m)	0.1	0.1	2.1	1.8
Control Delay (s)	0.1	0.1	19.5	23.0
Lane LOS	A	A	C	C
Approach Delay (s)	0.1	0.1	19.5	23.0
Approach LOS			C	C

Intersection Summary				
Average Delay			0.8	
Intersection Capacity Utilization			46.1%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
5: Country Road 22 & Highway 400 South Ramp

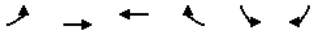
11/15/2016

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	67	329	526	242	6	102
Future Volume (vph)	67	329	526	242	6	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.872	
Flt Protected		0.992			0.997	
Satd. Flow (prot)	0	1783	1824	1581	1597	0
Flt Permitted		0.992			0.997	
Satd. Flow (perm)	0	1783	1824	1581	1597	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		661.0	382.0		499.1	
Travel Time (s)		47.6	27.5		35.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	4%	3%	1%	25%	1%
Adj. Flow (vph)	71	346	554	255	6	107
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	417	554	255	113	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	65.3%	ICU Level of Service C	
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: Country Road 22 & Highway 400 South Ramp

11/15/2016



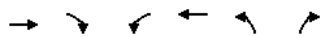
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	67	329	526	242	6	102
Future Volume (Veh/h)	67	329	526	242	6	102
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	71	346	554	255	6	107
Pedestrians						
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	554				1042	554
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	554				1042	554
tC, single (s)	4.2				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.7	3.3
p0 queue free %	93				97	80
cM capacity (veh/h)	992				214	534

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	417	554	255	113
Volume Left	71	0	0	6
Volume Right	0	0	255	107
cSH	992	1700	1700	495
Volume to Capacity	0.07	0.33	0.15	0.23
Queue Length 95th (m)	1.8	0.0	0.0	7.0
Control Delay (s)	2.2	0.0	0.0	14.4
Lane LOS	A			B
Approach Delay (s)	2.2	0.0		14.4
Approach LOS				B

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		

Lanes, Volumes, Timings
6: Highway 400 North Ramp & County Road 22

11/15/2016



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	276	57	21	732	49	145
Future Volume (vph)	276	57	21	732	49	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.999	0.950	
Satd. Flow (prot)	1824	1581	0	1804	1785	1566
Flt Permitted				0.999	0.950	
Satd. Flow (perm)	1824	1581	0	1804	1785	1566
Link Speed (k/h)	50			80	50	
Link Distance (m)	382.0			36.2	392.3	
Travel Time (s)	27.5			1.6	28.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	1%	5%	4%	0%	2%
Adj. Flow (vph)	291	60	22	771	52	153
Shared Lane Traffic (%)						
Lane Group Flow (vph)	291	60	0	793	52	153
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6: Highway 400 North Ramp & County Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	276	57	21	732	49	145
Future Volume (Veh/h)	276	57	21	732	49	145
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	291	60	22	771	52	153
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			291		1106	291
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			291		1106	291
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		77	80
cM capacity (veh/h)			1254		231	748

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2
Volume Total	291	60	793	52	153
Volume Left	0	0	22	52	0
Volume Right	0	60	0	0	153
cSH	1700	1700	1254	231	748
Volume to Capacity	0.17	0.04	0.02	0.23	0.20
Queue Length 95th (m)	0.0	0.0	0.4	6.7	6.1
Control Delay (s)	0.0	0.0	0.5	25.1	11.0
Lane LOS			A	D	B
Approach Delay (s)	0.0		0.5	14.6	
Approach LOS				B	

Intersection Summary				
Average Delay	2.5			
Intersection Capacity Utilization	65.4%	ICU Level of Service		C
Analysis Period (min)	15			

Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	376	44	56	681	85	70	62	33	51	43	22
Future Volume (vph)	27	376	44	56	681	85	70	62	33	51	43	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	180.0		0.0	185.0		0.0	157.0		0.0	150.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.984			0.983			0.947			0.949	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	1816	0	1733	1774	0	1623	1734	0	1785	1704	0
Flt Permitted	0.143			0.427			0.713			0.692		
Satd. Flow (perm)	266	1816	0	779	1774	0	1218	1734	0	1300	1704	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			14			35			23	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1121.3			305.8			269.5			271.6	
Travel Time (s)		80.7			22.0			19.4			19.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	2%	0%	3%	4%	5%	10%	4%	0%	0%	7%	0%
Adj. Flow (vph)	28	396	46	59	717	89	74	65	35	54	45	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	442	0	59	806	0	74	100	0	54	68	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	24.0	24.0		24.0	24.0		26.0	26.0		26.0	26.0	
Total Split (s)	34.0	34.0		34.0	34.0		26.0	26.0		26.0	26.0	
Total Split (%)	56.7%	56.7%		56.7%	56.7%		43.3%	43.3%		43.3%	43.3%	
Maximum Green (s)	28.0	28.0		28.0	28.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	13.0	13.0		13.0	13.0		15.0	15.0		15.0	15.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	28.0	28.0		28.0	28.0		20.0	20.0		20.0	20.0	
Actuated g/C Ratio	0.47	0.47		0.47	0.47		0.33	0.33		0.33	0.33	

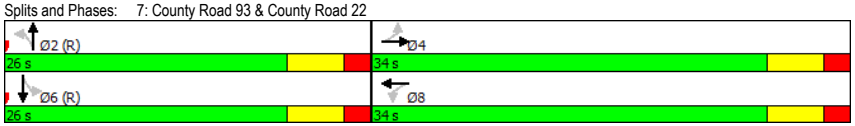
Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.23	0.52		0.16	0.97		0.18	0.17		0.12	0.12	
Control Delay	15.0	13.5		10.7	42.2		15.7	10.9		14.9	10.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	15.0	13.5		10.7	42.2		15.7	10.9		14.9	10.8	
LOS	B	B		B	D		B	B		B	B	
Approach Delay		13.5			40.1			12.9			12.7	
Approach LOS		B			D			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 27.5		Intersection LOS: C	
Intersection Capacity Utilization 73.2%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 7: County Road 93 & County Road 22



Queues
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	28	442	59	806	74	100	54	68
v/c Ratio	0.23	0.52	0.16	0.97	0.18	0.17	0.12	0.12
Control Delay	15.0	13.5	10.7	42.2	15.7	10.9	14.9	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.0	13.5	10.7	42.2	15.7	10.9	14.9	10.8
Queue Length 50th (m)	1.8	29.6	3.7	83.5	6.0	5.1	4.3	3.5
Queue Length 95th (m)	m6.5	60.6	10.0	#158.7	14.6	14.2	11.2	10.9
Internal Link Dist (m)		1097.3		281.8		245.5		247.6
Turn Bay Length (m)	180.0		185.0		157.0		150.0	
Base Capacity (vph)	124	854	363	835	406	601	433	583
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.52	0.16	0.97	0.18	0.17	0.12	0.12

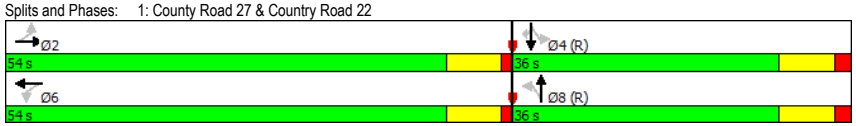
Intersection Summary	
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.
m	Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	559	16	65	366	135	27	520	180	114	266	66
Future Volume (vph)	57	559	16	65	366	135	27	520	180	114	266	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	110.0		0.0	0.0		0.0	130.0		0.0	125.0		110.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			0.0			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.996			0.968			0.961				0.850
Flt Protected	0.950				0.994		0.950			0.950		
Satd. Flow (prot)	1767	1778	0	0	1715	0	1700	3431	0	1668	1842	1597
Flt Permitted	0.395				0.732		0.513			0.251		
Satd. Flow (perm)	735	1778	0	0	1263	0	918	3431	0	441	1842	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			26			56				69
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		515.9			1538.1			209.3			305.4	
Travel Time (s)		23.2			69.2			9.4			13.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	5%	13%	8%	7%	0%	5%	0%	0%	7%	2%	0%
Adj. Flow (vph)	60	588	17	68	385	142	28	547	189	120	280	69
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	605	0	0	595	0	28	736	0	120	280	69
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		4
Minimum Split (s)	27.8	27.8		27.8	27.8		17.8	17.8		17.8	17.8	17.8
Total Split (s)	54.0	54.0		54.0	54.0		36.0	36.0		36.0	36.0	36.0
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	40.0%
Maximum Green (s)	46.9	46.9		46.9	46.9		28.2	28.2		28.2	28.2	28.2
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.2	1.2		1.2	1.2		1.9	1.9		1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1			7.1		7.8	7.8		7.8	7.8	7.8
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)	46.9	46.9			46.9		28.2	28.2		28.2	28.2	28.2
Actuated g/C Ratio	0.52	0.52			0.52		0.31	0.31		0.31	0.31	0.31
v/c Ratio	0.16	0.65			0.89		0.10	0.66		0.87	0.49	0.13
Control Delay	12.6	19.8			36.3		23.1	28.0		81.7	28.5	6.5
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	12.6	19.8			36.3		23.1	28.0		81.7	28.5	6.5
LOS	B	B			D		C	C		F	C	A
Approach Delay		19.1			36.3			27.8			38.9	
Approach LOS		B			D			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 29.6		Intersection LOS: C	
Intersection Capacity Utilization 114.8%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 1: County Road 27 & Country Road 22



Queues
1: County Road 27 & Country Road 22

11/15/2016

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	60	605	595	28	736	120	280	69
v/c Ratio	0.16	0.65	0.89	0.10	0.66	0.87	0.49	0.13
Control Delay	12.6	19.8	36.3	23.1	28.0	81.7	28.5	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.6	19.8	36.3	23.1	28.0	81.7	28.5	6.5
Queue Length 50th (m)	5.4	75.3	88.2	3.6	56.0	20.5	40.9	0.0
Queue Length 95th (m)	12.7	113.1	#162.3	10.1	76.0	#54.3	65.2	9.2
Internal Link Dist (m)		491.9	1514.1		185.3		281.4	
Turn Bay Length (m)	110.0			130.0		125.0		110.0
Base Capacity (vph)	383	927	670	287	1113	138	577	547
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.65	0.89	0.10	0.66	0.87	0.49	0.13

Intersection Summary

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

Lanes, Volumes, Timings
2: Gill Road & Country Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	875	10	10	612	17	3	2	2	18	1	18
Future Volume (vph)	21	875	10	10	612	17	3	2	2	18	1	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.9	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.996			0.961			0.934	
Flt Protected		0.999			0.999			0.979			0.976	
Satd. Flow (prot)	0	1820	0	0	1784	0	0	1649	0	0	1664	0
Flt Permitted		0.999			0.999			0.979			0.976	
Satd. Flow (perm)	0	1820	0	0	1784	0	0	1649	0	0	1664	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		1538.1			370.7			296.2			94.4	
Travel Time (s)		69.2			16.7			17.8			6.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	5%	0%	5%	0%	0%	0%	0%	6%	0%	0%
Adj. Flow (vph)	22	921	11	11	644	18	3	2	2	19	1	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	954	0	0	673	0	0	7	0	0	39	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.11	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 68.3% ICU Level of Service C
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
2: Gill Road & Country Road 22

11/15/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	875	10	10	612	17	3	2	2	18	1	18
Future Volume (Veh/h)	21	875	10	10	612	17	3	2	2	18	1	18
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	22	921	11	11	644	18	3	2	2	19	1	19
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	662			932			1665	1654	926	1648	1651	653
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	662			932			1665	1654	926	1648	1651	653
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	98			99			96	98	99	74	99	96
cM capacity (veh/h)	936			743			72	95	328	73	96	471

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	954	673	7	39
Volume Left	22	11	3	19
Volume Right	11	18	2	19
cSH	936	743	102	126
Volume to Capacity	0.02	0.01	0.07	0.31
Queue Length 95th (m)	0.6	0.4	1.7	9.7
Control Delay (s)	0.7	0.4	42.9	45.9
Lane LOS	A	A	E	E
Approach Delay (s)	0.7	0.4	42.9	45.9
Approach LOS			E	E

Intersection Summary					
Average Delay			1.8		
Intersection Capacity Utilization			68.3%	ICU Level of Service	C
Analysis Period (min)			15		

Lanes, Volumes, Timings
3: Fox Farm Road & Country Road 22

11/15/2016

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	910	8	11	640	5	10
Future Volume (vph)	910	8	11	640	5	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999				0.907	
Flt Protected				0.999	0.985	
Satd. Flow (prot)	1823	0	0	1802	1679	0
Flt Permitted				0.999	0.985	
Satd. Flow (perm)	1823	0	0	1802	1679	0
Link Speed (k/h)	80			50	80	
Link Distance (m)	153.6			1063.4	320.8	
Travel Time (s)	6.9			76.6	14.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	0%	12%	4%	0%	0%
Adj. Flow (vph)	958	8	12	674	5	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	966	0	0	686	16	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary				
Area Type:	Other			
Control Type: Unsignalized				
Intersection Capacity Utilization 58.4%			ICU Level of Service B	
Analysis Period (min) 15				

HCM Unsignalized Intersection Capacity Analysis
3: Fox Farm Road & Country Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	910	8	11	640	5	10
Future Volume (Veh/h)	910	8	11	640	5	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	958	8	12	674	5	11
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			966		1660	962
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			966		1660	962
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			98		95	96
cM capacity (veh/h)			674		106	313

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	966	686	16
Volume Left	0	12	5
Volume Right	8	0	11
cSH	1700	674	195
Volume to Capacity	0.57	0.02	0.08
Queue Length 95th (m)	0.0	0.4	2.1
Control Delay (s)	0.0	0.5	25.1
Lane LOS		A	D
Approach Delay (s)	0.0	0.5	25.1
Approach LOS			D

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		

Lanes, Volumes, Timings
4: Old Second Road

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	910	8	7	631	23	5	16	9	14	5	6
Future Volume (vph)	4	910	8	7	631	23	5	16	9	14	5	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.995			0.961			0.969	
Flt Protected					0.999			0.992			0.972	
Satd. Flow (prot)	0	1786	0	0	1796	0	0	1727	0	0	1587	0
Flt Permitted					0.999			0.992			0.972	
Satd. Flow (perm)	0	1786	0	0	1796	0	0	1727	0	0	1587	0
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		1063.4			661.0			398.3			389.2	
Travel Time (s)		76.6			47.6			17.9			17.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	5%	16%	16%	4%	0%	7%	0%	9%	20%	0%	0%
Adj. Flow (vph)	4	958	8	7	664	24	5	17	9	15	5	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	970	0	0	695	0	0	31	0	0	26	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	61.2%	ICU Level of Service B	
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
4: Old Second Road

11/15/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	910	8	7	631	23	5	16	9	14	5	6
Future Volume (Veh/h)	4	910	8	7	631	23	5	16	9	14	5	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	958	8	7	664	24	5	17	9	15	5	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	688			966			1668	1672	962	1678	1664	676
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	688			966			1668	1672	962	1678	1664	676
tC, single (s)	4.1			4.3			7.2	6.5	6.3	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.4	3.7	4.0	3.3
p0 queue free %	100			99			93	82	97	73	95	99
cM capacity (veh/h)	916			660			70	95	301	56	96	457

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	970	695	31	26
Volume Left	4	7	5	15
Volume Right	8	24	9	6
cSH	916	660	111	79
Volume to Capacity	0.00	0.01	0.28	0.33
Queue Length 95th (m)	0.1	0.3	8.4	10.0
Control Delay (s)	0.1	0.3	49.7	72.0
Lane LOS	A	A	E	F
Approach Delay (s)	0.1	0.3	49.7	72.0
Approach LOS			E	F

Intersection Summary				
Average Delay	2.2			
Intersection Capacity Utilization	61.2%	ICU Level of Service	B	
Analysis Period (min)	15			

Lanes, Volumes, Timings
5: Country Road 22 & Highway 400 Southbound Off-Ramp

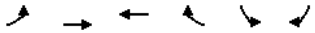
11/15/2016

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	77	841	557	143	13	99
Future Volume (vph)	77	841	557	143	13	99
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.881	
Flt Protected		0.996			0.994	
Satd. Flow (prot)	0	1795	1824	1581	1584	0
Flt Permitted		0.996			0.994	
Satd. Flow (perm)	0	1795	1824	1581	1584	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		661.0	382.0		499.1	
Travel Time (s)		47.6	27.5		35.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	4%	3%	1%	25%	1%
Adj. Flow (vph)	81	885	586	151	14	104
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	966	586	151	118	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	94.7%	ICU Level of Service F	
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: Country Road 22 & Highway 400 Southbound Off-Ramp

11/15/2016



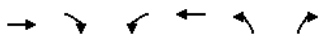
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	77	841	557	143	13	99
Future Volume (Veh/h)	77	841	557	143	13	99
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	81	885	586	151	14	104
Pedestrians						
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	586				1633	586
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	586				1633	586
tC, single (s)	4.2				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.7	3.3
p0 queue free %	92				84	80
cM capacity (veh/h)	965				90	512

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	966	586	151	118
Volume Left	81	0	0	14
Volume Right	0	0	151	104
cSH	965	1700	1700	329
Volume to Capacity	0.08	0.34	0.09	0.36
Queue Length 95th (m)	2.2	0.0	0.0	12.7
Control Delay (s)	2.2	0.0	0.0	22.0
Lane LOS	A			C
Approach Delay (s)	2.2	0.0		22.0
Approach LOS				C

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	94.7%	ICU Level of Service	F
Analysis Period (min)	15		

Lanes, Volumes, Timings
6: Highway 400 Southbound On-Ramp & County Road 22

11/15/2016



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	594	241	35	594	86	329
Future Volume (vph)	594	241	35	594	86	329
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.997	0.950	
Satd. Flow (prot)	1824	1581	0	1800	1785	1566
Flt Permitted				0.997	0.950	
Satd. Flow (perm)	1824	1581	0	1800	1785	1566
Link Speed (k/h)	50			80	50	
Link Distance (m)	382.0			36.2	392.3	
Travel Time (s)	27.5			1.6	28.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	1%	5%	4%	0%	2%
Adj. Flow (vph)	625	254	37	625	91	346
Shared Lane Traffic (%)						
Lane Group Flow (vph)	625	254	0	662	91	346
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	71.3%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6: Highway 400 Southbound On-Ramp & County Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	594	241	35	594	86	329
Future Volume (Veh/h)	594	241	35	594	86	329
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	625	254	37	625	91	346
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			625		1324	625
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			625		1324	625
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		45	29
cM capacity (veh/h)			942		167	485

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2
Volume Total	625	254	662	91	346
Volume Left	0	0	37	91	0
Volume Right	0	254	0	0	346
cSH	1700	1700	942	167	485
Volume to Capacity	0.37	0.15	0.04	0.55	0.71
Queue Length 95th (m)	0.0	0.0	1.0	22.2	45.1
Control Delay (s)	0.0	0.0	1.0	49.8	28.8
Lane LOS			A	E	D
Approach Delay (s)	0.0		1.0	33.2	
Approach LOS				D	

Intersection Summary				
Average Delay	7.7			
Intersection Capacity Utilization	71.3%	ICU Level of Service		C
Analysis Period (min)	15			

Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	828	68	50	576	108	69	113	134	86	55	29
Future Volume (vph)	53	828	68	50	576	108	69	113	134	86	55	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	180.0		0.0	185.0		0.0	157.0		0.0	150.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.989			0.976			0.919			0.948	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	1825	0	1733	1761	0	1623	1696	0	1785	1703	0
Flt Permitted	0.252			0.101			0.699			0.500		
Satd. Flow (perm)	469	1825	0	184	1761	0	1194	1696	0	939	1703	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			21			78			31	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1121.3			305.8			269.5			271.6	
Travel Time (s)		80.7			22.0			19.4			19.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	2%	0%	3%	4%	5%	10%	4%	0%	0%	7%	0%
Adj. Flow (vph)	56	872	72	53	606	114	73	119	141	91	58	31
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	944	0	53	720	0	73	260	0	91	89	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	24.0	24.0		24.0	24.0		26.0	26.0		26.0	26.0	
Total Split (s)	49.0	49.0		49.0	49.0		26.0	26.0		26.0	26.0	
Total Split (%)	65.3%	65.3%		65.3%	65.3%		34.7%	34.7%		34.7%	34.7%	
Maximum Green (s)	43.0	43.0		43.0	43.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	13.0	13.0		13.0	13.0		15.0	15.0		15.0	15.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	43.0	43.0		43.0	43.0		20.0	20.0		20.0	20.0	
Actuated g/C Ratio	0.57	0.57		0.57	0.57		0.27	0.27		0.27	0.27	

Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.21	0.90		0.50	0.71		0.23	0.51		0.36	0.19	
Control Delay	10.2	27.8		31.1	15.9		23.9	20.2		27.5	16.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	10.2	27.8		31.1	15.9		23.9	20.2		27.5	16.1	
LOS	B	C		C	B		C	C		C	B	
Approach Delay		26.8			17.0			21.0			21.9	
Approach LOS		C			B			C			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 75			
Actuated Cycle Length: 75			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Pretimed			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 22.2		Intersection LOS: C	
Intersection Capacity Utilization 96.0%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 7: County Road 93 & County Road 22

Queues
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	56	944	53	720	73	260	91	89
v/c Ratio	0.21	0.90	0.50	0.71	0.23	0.51	0.36	0.19
Control Delay	10.2	27.8	31.1	15.9	23.9	20.2	27.5	16.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.2	27.8	31.1	15.9	23.9	20.2	27.5	16.1
Queue Length 50th (m)	3.7	111.7	4.3	67.9	8.5	22.2	11.0	6.6
Queue Length 95th (m)	10.1	#202.4	#21.9	109.2	19.1	44.6	24.3	17.4
Internal Link Dist (m)		1097.3		281.8		245.5		247.6
Turn Bay Length (m)	180.0		185.0		157.0		150.0	
Base Capacity (vph)	268	1050	105	1018	318	509	250	476
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.90	0.50	0.71	0.23	0.51	0.36	0.19

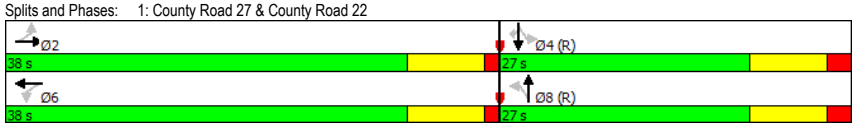
Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	410	23	77	355	148	17	447	169	115	344	33
Future Volume (vph)	56	410	23	77	355	148	17	447	169	115	344	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	110.0		0.0	0.0		0.0	130.0		0.0	125.0		110.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			0.0			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.992			0.966			0.959				0.850
Flt Protected	0.950				0.993		0.950			0.950		
Satd. Flow (prot)	1767	1768	0	0	1711	0	1700	3424	0	1668	1842	1597
Flt Permitted	0.395				0.844		0.439			0.343		
Satd. Flow (perm)	735	1768	0	0	1454	0	786	3424	0	602	1842	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			36			85				69
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		515.9			1538.1			209.3			305.4	
Travel Time (s)		23.2			69.2			9.4			13.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	5%	13%	8%	7%	0%	5%	0%	0%	7%	2%	0%
Adj. Flow (vph)	59	432	24	81	374	156	18	471	178	121	362	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	59	456	0	0	611	0	18	649	0	121	362	35
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		4
Minimum Split (s)	27.8	27.8		27.8	27.8		17.8	17.8		17.8	17.8	17.8
Total Split (s)	38.0	38.0		38.0	38.0		27.0	27.0		27.0	27.0	27.0
Total Split (%)	58.5%	58.5%		58.5%	58.5%		41.5%	41.5%		41.5%	41.5%	41.5%
Maximum Green (s)	30.9	30.9		30.9	30.9		19.2	19.2		19.2	19.2	19.2
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.2	1.2		1.2	1.2		1.9	1.9		1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1			7.1		7.8	7.8		7.8	7.8	7.8
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)	30.9	30.9			30.9		19.2	19.2		19.2	19.2	19.2
Actuated g/C Ratio	0.48	0.48			0.48		0.30	0.30		0.30	0.30	0.30
v/c Ratio	0.17	0.54			0.86		0.08	0.61		0.68	0.67	0.07
Control Delay	11.3	14.9			24.5		17.7	19.8		43.8	27.1	2.1
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	11.3	14.9			24.5		17.7	19.8		43.8	27.1	2.1
LOS	B	B			C		B	B		D	C	A
Approach Delay		14.5			24.5			19.7			29.3	
Approach LOS		B			C			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 65			
Actuated Cycle Length: 65			
Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green			
Natural Cycle: 65			
Control Type: Pretimed			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 22.0		Intersection LOS: C	
Intersection Capacity Utilization 106.2%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 1: County Road 27 & County Road 22



Queues
1: County Road 27 & County Road 22

11/15/2016

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	59	456	611	18	649	121	362	35
v/c Ratio	0.17	0.54	0.86	0.08	0.61	0.68	0.67	0.07
Control Delay	11.3	14.9	24.5	17.7	19.8	43.8	27.1	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.3	14.9	24.5	17.7	19.8	43.8	27.1	2.1
Queue Length 50th (m)	4.0	37.7	31.1	1.6	31.6	13.4	39.9	0.0
Queue Length 95th (m)	10.6	62.8	m#113.5	6.1	47.7	#38.3	66.9	2.4
Internal Link Dist (m)		491.9	1514.1		185.3		281.4	
Turn Bay Length (m)	110.0			130.0		125.0		110.0
Base Capacity (vph)	349	843	710	232	1071	177	544	520
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.54	0.86	0.08	0.61	0.68	0.67	0.07

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
2: Gill Road & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	692	18	14	574	10	11	3	9	15	0	12
Future Volume (vph)	13	692	18	14	574	10	11	3	9	15	0	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.9	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.998			0.949			0.939	
Flt Protected		0.999			0.999			0.976			0.973	
Satd. Flow (prot)	0	1817	0	0	1788	0	0	1623	0	0	1662	0
Flt Permitted		0.999			0.999			0.976			0.973	
Satd. Flow (perm)	0	1817	0	0	1788	0	0	1623	0	0	1662	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		1538.1			370.7			296.2			94.4	
Travel Time (s)		69.2			16.7			17.8			6.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	5%	0%	5%	0%	0%	0%	0%	6%	0%	0%
Adj. Flow (vph)	14	728	19	15	604	11	12	3	9	16	0	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	761	0	0	630	0	0	24	0	0	29	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.11	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 53.7% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
2: Gill Road & County Road 22

11/15/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	692	18	14	574	10	11	3	9	15	0	12
Future Volume (Veh/h)	13	692	18	14	574	10	11	3	9	15	0	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	14	728	19	15	604	11	12	3	9	16	0	13
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	615			747			1418	1410	738	1416	1414	610
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	615			747			1418	1410	738	1416	1414	610
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	99			98			89	98	98	85	100	97
cM capacity (veh/h)	974			870			110	135	421	106	134	498

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	761	630	24	29
Volume Left	14	15	12	16
Volume Right	19	11	9	13
cSH	974	870	157	164
Volume to Capacity	0.01	0.02	0.15	0.18
Queue Length 95th (m)	0.3	0.4	4.2	5.0
Control Delay (s)	0.4	0.5	32.0	31.7
Lane LOS	A	A	D	D
Approach Delay (s)	0.4	0.5	32.0	31.7
Approach LOS			D	D

Intersection Summary				
Average Delay			1.6	
Intersection Capacity Utilization			53.7%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
3: Fox Farm Road & County Road 22/Country Road 22

11/15/2016

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	712	11	13	593	3	6
Future Volume (vph)	712	11	13	593	3	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.998				0.910	
Flt Protected				0.999	0.984	
Satd. Flow (prot)	1821	0	0	1802	1682	0
Flt Permitted				0.999	0.984	
Satd. Flow (perm)	1821	0	0	1802	1682	0
Link Speed (k/h)	80			50	80	
Link Distance (m)	153.6			1063.4	320.8	
Travel Time (s)	6.9			76.6	14.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	0%	12%	4%	0%	0%
Adj. Flow (vph)	749	12	14	624	3	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	761	0	0	638	9	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Fox Farm Road & County Road 22/Country Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	712	11	13	593	3	6
Future Volume (Veh/h)	712	11	13	593	3	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	749	12	14	624	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			761		1407	755
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			761		1407	755
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			98		98	99
cM capacity (veh/h)			808		152	412

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	761	638	9
Volume Left	0	14	3
Volume Right	12	0	6
cSH	1700	808	262
Volume to Capacity	0.45	0.02	0.03
Queue Length 95th (m)	0.0	0.4	0.8
Control Delay (s)	0.0	0.5	19.2
Lane LOS		A	C
Approach Delay (s)	0.0	0.5	19.2
Approach LOS			C

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
4: Old Second Road

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	687	12	6	582	48	14	24	11	10	9	5
Future Volume (vph)	13	687	12	6	582	48	14	24	11	10	9	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.990			0.969			0.973	
Flt Protected		0.999						0.986			0.978	
Satd. Flow (prot)	0	1782	0	0	1792	0	0	1725	0	0	1643	0
Flt Permitted		0.999						0.986			0.978	
Satd. Flow (perm)	0	1782	0	0	1792	0	0	1725	0	0	1643	0
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		1063.4			661.0			398.3			389.2	
Travel Time (s)		76.6			47.6			17.9			17.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	5%	16%	16%	4%	0%	7%	0%	9%	20%	0%	0%
Adj. Flow (vph)	14	723	13	6	613	51	15	25	12	11	9	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	750	0	0	670	0	0	52	0	0	25	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	55.1%	ICU Level of Service B	
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
4: Old Second Road

11/15/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	687	12	6	582	48	14	24	11	10	9	5
Future Volume (Veh/h)	13	687	12	6	582	48	14	24	11	10	9	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	14	723	13	6	613	51	15	25	12	11	9	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	664			736			1418	1434	730	1432	1414	638
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	664			736			1418	1434	730	1432	1414	638
tC, single (s)	4.1			4.3			7.2	6.5	6.3	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.4	3.7	4.0	3.3
p0 queue free %	99			99			85	81	97	87	93	99
cM capacity (veh/h)	935			809			103	132	411	83	136	480

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	750	670	52	25
Volume Left	14	6	15	11
Volume Right	13	51	12	5
cSH	935	809	143	120
Volume to Capacity	0.01	0.01	0.36	0.21
Queue Length 95th (m)	0.4	0.2	12.1	6.0
Control Delay (s)	0.4	0.2	43.9	42.8
Lane LOS	A	A	E	E
Approach Delay (s)	0.4	0.2	43.9	42.8
Approach LOS			E	E

Intersection Summary				
Average Delay			2.5	
Intersection Capacity Utilization			55.1%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
5: Country Road 22 & Highway 400 South Ramp

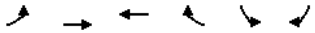
11/15/2016

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	98	607	540	180	9	98
Future Volume (vph)	98	607	540	180	9	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.876	
Flt Protected		0.993			0.996	
Satd. Flow (prot)	0	1787	1824	1581	1593	0
Flt Permitted		0.993			0.996	
Satd. Flow (perm)	0	1787	1824	1581	1593	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		661.0	382.0		499.1	
Travel Time (s)		47.6	27.5		35.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	4%	3%	1%	25%	1%
Adj. Flow (vph)	103	639	568	189	9	103
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	742	568	189	112	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: Country Road 22 & Highway 400 South Ramp

11/15/2016



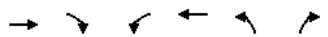
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	98	607	540	180	9	98
Future Volume (Veh/h)	98	607	540	180	9	98
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	103	639	568	189	9	103
Pedestrians						
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	568				1413	568
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	568				1413	568
tC, single (s)	4.2				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.7	3.3
p0 queue free %	89				93	80
cM capacity (veh/h)	980				121	524

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	742	568	189	112
Volume Left	103	0	0	9
Volume Right	0	0	189	103
cSH	980	1700	1700	414
Volume to Capacity	0.11	0.33	0.11	0.27
Queue Length 95th (m)	2.8	0.0	0.0	8.7
Control Delay (s)	2.6	0.0	0.0	16.9
Lane LOS	A			C
Approach Delay (s)	2.6	0.0		16.9
Approach LOS				C

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		

Lanes, Volumes, Timings
6: Highway 400 North Ramp & County Road 22

11/15/2016



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	512	95	33	604	109	357
Future Volume (vph)	512	95	33	604	109	357
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.997	0.950	
Satd. Flow (prot)	1824	1581	0	1800	1785	1566
Flt Permitted				0.997	0.950	
Satd. Flow (perm)	1824	1581	0	1800	1785	1566
Link Speed (k/h)	50			80	50	
Link Distance (m)	382.0			36.2	392.3	
Travel Time (s)	27.5			1.6	28.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	1%	5%	4%	0%	2%
Adj. Flow (vph)	539	100	35	636	115	376
Shared Lane Traffic (%)						
Lane Group Flow (vph)	539	100	0	671	115	376
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6: Highway 400 North Ramp & County Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	512	95	33	604	109	357
Future Volume (Veh/h)	512	95	33	604	109	357
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	539	100	35	636	115	376
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			539		1245	539
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			539		1245	539
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		39	31
cM capacity (veh/h)			1014		187	542

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2
Volume Total	539	100	671	115	376
Volume Left	0	0	35	115	0
Volume Right	0	100	0	0	376
cSH	1700	1700	1014	187	542
Volume to Capacity	0.32	0.06	0.03	0.61	0.69
Queue Length 95th (m)	0.0	0.0	0.9	27.6	43.1
Control Delay (s)	0.0	0.0	0.9	50.8	25.3
Lane LOS			A	F	D
Approach Delay (s)	0.0		0.9	31.2	
Approach LOS				D	

Intersection Summary				
Average Delay	8.9			
Intersection Capacity Utilization	71.4%	ICU Level of Service		C
Analysis Period (min)	15			

Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	771	69	56	555	127	29	94	176	82	70	40
Future Volume (vph)	64	771	69	56	555	127	29	94	176	82	70	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	180.0		0.0	185.0		0.0	157.0		0.0	150.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988			0.972			0.902			0.946	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	1823	0	1733	1753	0	1623	1671	0	1785	1701	0
Flt Permitted	0.211			0.121			0.682			0.514		
Satd. Flow (perm)	393	1823	0	221	1753	0	1165	1671	0	966	1701	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			26			132			42	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1121.3			305.8			269.5			271.6	
Travel Time (s)		80.7			22.0			19.4			19.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	2%	0%	3%	4%	5%	10%	4%	0%	0%	7%	0%
Adj. Flow (vph)	67	812	73	59	584	134	31	99	185	86	74	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	885	0	59	718	0	31	284	0	86	116	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	24.0	24.0		24.0	24.0		26.0	26.0		26.0	26.0	
Total Split (s)	39.0	39.0		39.0	39.0		26.0	26.0		26.0	26.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	33.0	33.0		33.0	33.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	13.0	13.0		13.0	13.0		15.0	15.0		15.0	15.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	33.0	33.0		33.0	33.0		20.0	20.0		20.0	20.0	
Actuated g/C Ratio	0.51	0.51		0.51	0.51		0.31	0.31		0.31	0.31	

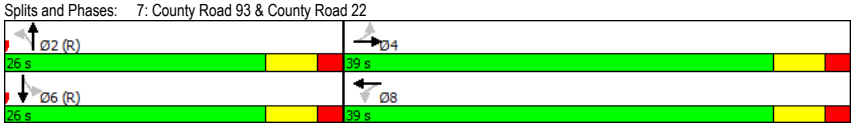
Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.34	0.95		0.53	0.80		0.09	0.47		0.29	0.21	
Control Delay	15.2	37.1		32.9	21.3		16.9	12.5		20.4	12.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	15.2	37.1		32.9	21.3		16.9	12.5		20.4	12.5	
LOS	B	D		C	C		B	B		C	B	
Approach Delay		35.6			22.2			13.0			15.9	
Approach LOS		D			C			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 65			
Actuated Cycle Length: 65			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 65			
Control Type: Pretimed			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 26.0		Intersection LOS: C	
Intersection Capacity Utilization 101.5%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 7: County Road 93 & County Road 22



Queues
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	67	885	59	718	31	284	86	116
v/c Ratio	0.34	0.95	0.53	0.80	0.09	0.47	0.29	0.21
Control Delay	15.2	37.1	32.9	21.3	16.9	12.5	20.4	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.2	37.1	32.9	21.3	16.9	12.5	20.4	12.5
Queue Length 50th (m)	4.9	85.3	4.6	67.2	2.8	14.5	8.2	6.7
Queue Length 95th (m)	m11.8	#180.1	#22.2	#131.3	8.4	34.1	19.2	17.6
Internal Link Dist (m)		1097.3		281.8		245.5		247.6
Turn Bay Length (m)	180.0		185.0		157.0		150.0	
Base Capacity (vph)	199	930	112	902	358	605	297	552
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.95	0.53	0.80	0.09	0.47	0.29	0.21

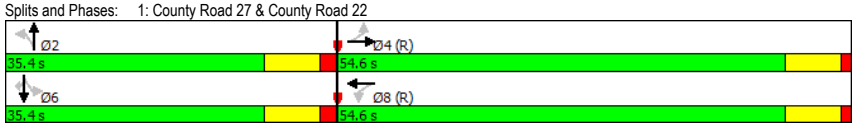
Intersection Summary	
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.
m	Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	250	17	113	498	173	23	584	96	88	503	40
Future Volume (vph)	40	250	17	113	498	173	23	584	96	88	503	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	110.0		0.0	0.0		0.0	130.0		0.0	125.0		110.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.990			0.970			0.979				0.850
Flt Protected	0.950				0.993		0.950			0.950		
Satd. Flow (prot)	1700	1632	0	0	1712	0	1417	3352	0	1653	1824	1342
Flt Permitted	0.307				0.895		0.160			0.260		
Satd. Flow (perm)	549	1632	0	0	1543	0	239	3352	0	452	1824	1342
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			24			21				50
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		515.9			1538.1			209.3			305.4	
Travel Time (s)		23.2			69.2			9.4			13.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	12%	43%	4%	6%	6%	26%	3%	12%	8%	3%	19%
Adj. Flow (vph)	42	263	18	119	524	182	24	615	101	93	529	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	281	0	0	825	0	24	716	0	93	529	42
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Minimum Split (s)	17.1	17.1		17.1	17.1		27.8	27.8		27.8	27.8	27.8
Total Split (s)	54.6	54.6		54.6	54.6		35.4	35.4		35.4	35.4	35.4
Total Split (%)	60.7%	60.7%		60.7%	60.7%		39.3%	39.3%		39.3%	39.3%	39.3%
Maximum Green (s)	47.5	47.5		47.5	47.5		27.6	27.6		27.6	27.6	27.6
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.2	1.2		1.2	1.2		1.9	1.9		1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1			7.1		7.8	7.8		7.8	7.8	7.8
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)	47.5	47.5			47.5		27.6	27.6		27.6	27.6	27.6
Actuated g/C Ratio	0.53	0.53			0.53		0.31	0.31		0.31	0.31	0.31
v/c Ratio	0.15	0.33			1.00		0.33	0.69		0.67	0.95	0.09
Control Delay	12.6	13.1			53.9		38.7	30.6		54.2	59.1	6.4
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	12.6	13.1			53.9		38.7	30.6		54.2	59.1	6.4
LOS	B	B			D		D	C		D	E	A
Approach Delay		13.1			53.9			30.9			55.1	
Approach LOS		B			D			C			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 90			
Control Type: Pretimed			
Maximum v/c Ratio: 1.00			
Intersection Signal Delay: 42.4		Intersection LOS: D	
Intersection Capacity Utilization 125.1%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 1: County Road 27 & County Road 22



Queues
1: County Road 27 & County Road 22

11/15/2016

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	42	281	825	24	716	93	529	42
v/c Ratio	0.15	0.33	1.00	0.33	0.69	0.67	0.95	0.09
Control Delay	12.6	13.1	53.9	38.7	30.6	54.2	59.1	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.6	13.1	53.9	38.7	30.6	54.2	59.1	6.4
Queue Length 50th (m)	3.7	26.9	139.0	3.4	58.1	14.7	93.4	0.0
Queue Length 95th (m)	9.7	43.7	#228.5	11.9	78.3	#40.1	#157.3	6.3
Internal Link Dist (m)		491.9	1514.1		185.3		281.4	
Turn Bay Length (m)	110.0			130.0		125.0		110.0
Base Capacity (vph)	289	864	825	73	1042	138	559	446
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.33	1.00	0.33	0.69	0.67	0.95	0.09

Intersection Summary

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

Lanes, Volumes, Timings
2: Gill Road & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	436	8	11	762	16	7	2	7	13	3	3
Future Volume (vph)	10	436	8	11	762	16	7	2	7	13	3	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.9	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.997			0.941			0.980	
Flt Protected		0.999			0.999			0.979			0.966	
Satd. Flow (prot)	0	1673	0	0	1765	0	0	1521	0	0	1779	0
Flt Permitted		0.999			0.999			0.979			0.966	
Satd. Flow (perm)	0	1673	0	0	1765	0	0	1521	0	0	1779	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		1538.1			370.7			296.2			94.4	
Travel Time (s)		69.2			16.7			17.8			6.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	12%	25%	18%	6%	0%	0%	0%	14%	0%	0%	0%
Adj. Flow (vph)	11	459	8	12	802	17	7	2	7	14	3	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	478	0	0	831	0	0	16	0	0	20	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.11	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 56.4% ICU Level of Service B
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
2: Gill Road & County Road 22

11/15/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	436	8	11	762	16	7	2	7	13	3	3
Future Volume (Veh/h)	10	436	8	11	762	16	7	2	7	13	3	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	459	8	12	802	17	7	2	7	14	3	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	819			467			1324	1328	463	1328	1324	810
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	819			467			1324	1328	463	1328	1324	810
tC, single (s)	4.1			4.3			7.1	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.4			3.5	4.0	3.4	3.5	4.0	3.3
p0 queue free %	99			99			95	99	99	89	98	99
cM capacity (veh/h)	818			1016			129	153	575	128	154	383

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	478	831	16	20
Volume Left	11	12	7	14
Volume Right	8	17	7	3
cSH	818	1016	201	146
Volume to Capacity	0.01	0.01	0.08	0.14
Queue Length 95th (m)	0.3	0.3	2.1	3.7
Control Delay (s)	0.4	0.3	24.5	33.4
Lane LOS	A	A	C	D
Approach Delay (s)	0.4	0.3	24.5	33.4
Approach LOS			C	D

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	56.4%	ICU Level of Service		B
Analysis Period (min)	15			

Lanes, Volumes, Timings
3: Fox Farm Road & County Road 22/Country Road 22

11/15/2016

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	433	22	39	722	59	105
Future Volume (vph)	433	22	39	722	59	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.994				0.913	
Flt Protected				0.997	0.982	
Satd. Flow (prot)	1799	0	0	1772	1685	0
Flt Permitted				0.997	0.982	
Satd. Flow (perm)	1799	0	0	1772	1685	0
Link Speed (k/h)	80			50	80	
Link Distance (m)	153.6			1063.4	320.8	
Travel Time (s)	6.9			76.6	14.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	20%	0%	6%	0%	0%
Adj. Flow (vph)	456	23	41	760	62	111
Shared Lane Traffic (%)						
Lane Group Flow (vph)	479	0	0	801	173	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary				
Area Type:	Other			
Control Type: Unsignalized				
Intersection Capacity Utilization	84.0%		ICU Level of Service	E
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
3: Fox Farm Road & County Road 22/Country Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	433	22	39	722	59	105
Future Volume (Veh/h)	433	22	39	722	59	105
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	456	23	41	760	62	111
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			479		1310	468
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			479		1310	468
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		64	81
cM capacity (veh/h)			1094		171	600

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	479	801	173
Volume Left	0	41	62
Volume Right	23	0	111
cSH	1700	1094	315
Volume to Capacity	0.28	0.04	0.55
Queue Length 95th (m)	0.0	0.9	24.8
Control Delay (s)	0.0	1.0	29.4
Lane LOS		A	D
Approach Delay (s)	0.0	1.0	29.4
Approach LOS			D

Intersection Summary			
Average Delay		4.0	
Intersection Capacity Utilization		84.0%	ICU Level of Service E
Analysis Period (min)		15	

Lanes, Volumes, Timings
4: Old Second Road

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	532	7	5	760	14	6	8	8	7	5	3
Future Volume (vph)	3	532	7	5	760	14	6	8	8	7	5	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.998			0.951			0.973	
Flt Protected								0.987			0.977	
Satd. Flow (prot)	0	1699	0	0	1771	0	0	1554	0	0	1677	0
Flt Permitted								0.987			0.977	
Satd. Flow (perm)	0	1699	0	0	1771	0	0	1554	0	0	1677	0
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		1063.4			661.0			398.3			389.2	
Travel Time (s)		76.6			47.6			17.9			17.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	10%	42%	0%	6%	0%	16%	25%	0%	14%	0%	0%
Adj. Flow (vph)	3	560	7	5	800	15	6	8	8	7	5	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	570	0	0	820	0	0	22	0	0	15	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 54.3%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
4: Old Second Road

11/15/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	532	7	5	760	14	6	8	8	7	5	3
Future Volume (Veh/h)	3	532	7	5	760	14	6	8	8	7	5	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	3	560	7	5	800	15	6	8	8	7	5	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	815			567			1392	1394	564	1399	1390	808
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	815			567			1392	1394	564	1399	1390	808
tC, single (s)	4.1			4.1			7.3	6.8	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.2	3.3	3.6	4.0	3.3
p0 queue free %	100			100			94	94	98	93	96	99
cM capacity (veh/h)	821			1015			107	126	529	103	142	384

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	570	820	22	15
Volume Left	3	5	6	7
Volume Right	7	15	8	3
cSH	821	1015	163	136
Volume to Capacity	0.00	0.00	0.14	0.11
Queue Length 95th (m)	0.1	0.1	3.7	2.9
Control Delay (s)	0.1	0.1	30.5	34.8
Lane LOS	A	A	D	D
Approach Delay (s)	0.1	0.1	30.5	34.8
Approach LOS			D	D

Intersection Summary				
Average Delay			1.0	
Intersection Capacity Utilization			54.3%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
5: Country Road 22 & Highway 400 South Ramp

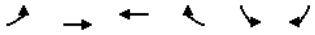
11/15/2016

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	72	471	676	307	8	102
Future Volume (vph)	72	471	676	307	8	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.874	
Flt Protected		0.993			0.997	
Satd. Flow (prot)	0	1692	968	882	1582	0
Flt Permitted		0.993			0.997	
Satd. Flow (perm)	0	1692	968	882	1582	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		661.0	382.0		499.1	
Travel Time (s)		47.6	27.5		35.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	12%	10%	94%	81%	50%	0%
Adj. Flow (vph)	76	496	712	323	8	107
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	572	712	323	115	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	81.1%	ICU Level of Service D	
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: Country Road 22 & Highway 400 South Ramp

11/15/2016



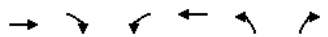
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	72	471	676	307	8	102
Future Volume (Veh/h)	72	471	676	307	8	102
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	76	496	712	323	8	107
Pedestrians						
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	712				1360	712
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	712				1360	712
tC, single (s)	4.2				6.9	6.2
tC, 2 stage (s)						
tF (s)	2.3				4.0	3.3
p0 queue free %	91				93	75
cM capacity (veh/h)	843				118	436

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	572	712	323	115
Volume Left	76	0	0	8
Volume Right	0	0	323	107
cSH	843	1700	1700	367
Volume to Capacity	0.09	0.42	0.19	0.31
Queue Length 95th (m)	2.4	0.0	0.0	10.5
Control Delay (s)	2.4	0.0	0.0	19.2
Lane LOS	A			C
Approach Delay (s)	2.4	0.0		19.2
Approach LOS				C

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		

Lanes, Volumes, Timings
6: Highway 400 North Ramp & County Road 22

11/15/2016



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	394	80	28	950	49	159
Future Volume (vph)	394	80	28	950	49	159
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.999	0.950	
Satd. Flow (prot)	1693	1465	0	1721	1653	1365
Flt Permitted				0.999	0.950	
Satd. Flow (perm)	1693	1465	0	1721	1653	1365
Link Speed (k/h)	50			80	50	
Link Distance (m)	382.0			36.2	392.3	
Travel Time (s)	27.5			1.6	28.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	11%	9%	12%	9%	8%	17%
Adj. Flow (vph)	415	84	29	1000	52	167
Shared Lane Traffic (%)						
Lane Group Flow (vph)	415	84	0	1029	52	167
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6: Highway 400 North Ramp & County Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	394	80	28	950	49	159
Future Volume (Veh/h)	394	80	28	950	49	159
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	415	84	29	1000	52	167
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			415		1473	415
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			415		1473	415
tC, single (s)			4.2		6.5	6.4
tC, 2 stage (s)						
tF (s)			2.3		3.6	3.5
p0 queue free %			97		61	72
cM capacity (veh/h)			1092		132	606

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2
Volume Total	415	84	1029	52	167
Volume Left	0	0	29	52	0
Volume Right	0	84	0	0	167
cSH	1700	1700	1092	132	606
Volume to Capacity	0.24	0.05	0.03	0.39	0.28
Queue Length 95th (m)	0.0	0.0	0.7	13.4	8.9
Control Delay (s)	0.0	0.0	0.8	49.1	13.2
Lane LOS			A	E	B
Approach Delay (s)	0.0		0.8	21.7	
Approach LOS				C	

Intersection Summary				
Average Delay	3.2			
Intersection Capacity Utilization	82.6%	ICU Level of Service		E
Analysis Period (min)	15			

Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	485	44	75	817	106	70	68	40	115	79	107
Future Volume (vph)	54	485	44	75	817	106	70	68	40	115	79	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	180.0		0.0	185.0		0.0	157.0		0.0	150.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988			0.983			0.945			0.914	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1668	1654	0	1428	1705	0	1750	1633	0	1733	1618	0
Flt Permitted	0.106			0.376			0.592			0.684		
Satd. Flow (perm)	186	1654	0	565	1705	0	1090	1633	0	1248	1618	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			15			35			82	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1121.3			305.8			269.5			271.6	
Travel Time (s)		80.7			22.0			19.4			19.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	13%	4%	25%	9%	3%	2%	8%	10%	3%	9%	4%
Adj. Flow (vph)	57	511	46	79	860	112	74	72	42	121	83	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	557	0	79	972	0	74	114	0	121	196	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	24.0	24.0		24.0	24.0		26.0	26.0		26.0	26.0	
Total Split (s)	54.0	54.0		54.0	54.0		26.0	26.0		26.0	26.0	
Total Split (%)	67.5%	67.5%		67.5%	67.5%		32.5%	32.5%		32.5%	32.5%	
Maximum Green (s)	48.0	48.0		48.0	48.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	13.0	13.0		13.0	13.0		15.0	15.0		15.0	15.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	48.0	48.0		48.0	48.0		20.0	20.0		20.0	20.0	
Actuated g/C Ratio	0.60	0.60		0.60	0.60		0.25	0.25		0.25	0.25	

Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.51	0.56		0.23	0.94		0.27	0.26		0.39	0.42	
Control Delay	30.1	12.1		9.7	34.1		27.5	18.9		29.4	17.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	30.1	12.1		9.7	34.1		27.5	18.9		29.4	17.7	
LOS	C	B		A	C		C	B		C	B	
Approach Delay		13.8			32.3			22.3			22.1	
Approach LOS		B			C			C			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Pretimed			
Maximum v/c Ratio: 0.94			
Intersection Signal Delay: 24.7		Intersection LOS: C	
Intersection Capacity Utilization 110.7%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 7: County Road 93 & County Road 22

Queues
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	57	557	79	972	74	114	121	196
v/c Ratio	0.51	0.56	0.23	0.94	0.27	0.26	0.39	0.42
Control Delay	30.1	12.1	9.7	34.1	27.5	18.9	29.4	17.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.1	12.1	9.7	34.1	27.5	18.9	29.4	17.7
Queue Length 50th (m)	4.8	47.5	5.3	128.2	9.6	10.0	16.1	14.7
Queue Length 95th (m)	#23.7	75.3	12.8	#226.6	21.2	23.4	31.7	33.4
Internal Link Dist (m)		1097.3		281.8		245.5		247.6
Turn Bay Length (m)	180.0		185.0		157.0		150.0	
Base Capacity (vph)	111	996	339	1029	272	434	312	466
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.56	0.23	0.94	0.27	0.26	0.39	0.42

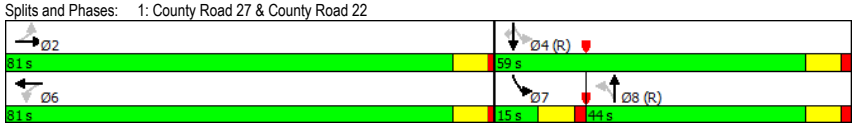
Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	699	16	79	444	163	27	831	218	153	570	66
Future Volume (vph)	57	699	16	79	444	163	27	831	218	153	570	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	110.0		0.0	0.0		0.0	130.0		0.0	125.0		110.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.997			0.968			0.969				0.850
Flt Protected	0.950				0.994		0.950			0.950		
Satd. Flow (prot)	1767	1781	0	0	1714	0	1700	3459	0	1668	1842	1597
Flt Permitted	0.324				0.440		0.177			0.091		
Satd. Flow (perm)	603	1781	0	0	759	0	317	3459	0	160	1842	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			17			23				69
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		515.9			1538.1			209.3			305.4	
Travel Time (s)		23.2			69.2			9.4			13.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	5%	13%	8%	7%	0%	5%	0%	0%	7%	2%	0%
Adj. Flow (vph)	60	736	17	83	467	172	28	875	229	161	600	69
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	753	0	0	722	0	28	1104	0	161	600	69
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8			4		4
Minimum Split (s)	17.1	17.1		17.1	17.1		27.8	27.8		12.8	27.8	27.8
Total Split (s)	81.0	81.0		81.0	81.0		44.0	44.0		15.0	59.0	59.0
Total Split (%)	57.9%	57.9%		57.9%	57.9%		31.4%	31.4%		10.7%	42.1%	42.1%
Maximum Green (s)	73.9	73.9		73.9	73.9		36.2	36.2		7.2	51.2	51.2
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.2	1.2		1.2	1.2		1.9	1.9		1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1			7.1		7.8	7.8		7.8	7.8	7.8
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Act Effct Green (s)	73.9	73.9			73.9		36.2	36.2		51.2	51.2	51.2
Actuated g/C Ratio	0.53	0.53			0.53		0.26	0.26		0.37	0.37	0.37
v/c Ratio	0.19	0.80			1.77		0.35	1.21		1.18	0.89	0.11
Control Delay	19.3	35.0			382.5		56.3	148.6		167.1	58.7	6.7
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	19.3	35.0			382.5		56.3	148.6		167.1	58.7	6.7
LOS	B	D			F		E	F		F	E	A
Approach Delay		33.9			382.5			146.3			75.4	
Approach LOS		C			F			F			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green			
Natural Cycle: 150			
Control Type: Pretimed			
Maximum v/c Ratio: 1.77			
Intersection Signal Delay: 152.1		Intersection LOS: F	
Intersection Capacity Utilization 146.9%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 1: County Road 27 & County Road 22



Queues
1: County Road 27 & County Road 22

11/15/2016

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	60	753	722	28	1104	161	600	69
v/c Ratio	0.19	0.80	1.77	0.35	1.21	1.18	0.89	0.11
Control Delay	19.3	35.0	382.5	56.3	148.6	167.1	58.7	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.3	35.0	382.5	56.3	148.6	167.1	58.7	6.7
Queue Length 50th (m)	8.9	174.1	~311.0	6.7	~204.4	~40.8	163.7	0.0
Queue Length 95th (m)	18.6	234.3	m#347.8	17.8	#249.3	#89.3	#234.1	10.5
Internal Link Dist (m)		491.9	1514.1		185.3		281.4	
Turn Bay Length (m)	110.0			130.0		125.0		110.0
Base Capacity (vph)	318	940	408	81	911	136	673	627
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.80	1.77	0.35	1.21	1.18	0.89	0.11

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
2: Gill Road & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	1097	10	10	738	17	3	2	2	18	1	18
Future Volume (vph)	21	1097	10	10	738	17	3	2	2	18	1	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.9	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.997			0.961			0.934	
Flt Protected		0.999			0.999			0.979			0.976	
Satd. Flow (prot)	0	1821	0	0	1785	0	0	1649	0	0	1664	0
Flt Permitted		0.999			0.999			0.979			0.976	
Satd. Flow (perm)	0	1821	0	0	1785	0	0	1649	0	0	1664	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		1538.1			370.7			296.2			94.4	
Travel Time (s)		69.2			16.7			17.8			6.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	5%	0%	5%	0%	0%	0%	0%	6%	0%	0%
Adj. Flow (vph)	22	1155	11	11	777	18	3	2	2	19	1	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1188	0	0	806	0	0	7	0	0	39	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.11	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 80.5% ICU Level of Service D
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
2: Gill Road & County Road 22

11/15/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	1097	10	10	738	17	3	2	2	18	1	18
Future Volume (Veh/h)	21	1097	10	10	738	17	3	2	2	18	1	18
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	22	1155	11	11	777	18	3	2	2	19	1	19
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	795			1166			2032	2022	1160	2016	2018	786
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	795			1166			2032	2022	1160	2016	2018	786
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	97			98			92	96	99	52	98	95
cM capacity (veh/h)	835			606			39	56	240	40	56	395

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	1188	806	7	39
Volume Left	22	11	3	19
Volume Right	11	18	2	19
cSH	835	606	58	71
Volume to Capacity	0.03	0.02	0.12	0.55
Queue Length 95th (m)	0.6	0.4	3.1	18.4
Control Delay (s)	1.0	0.5	75.6	104.4
Lane LOS	A	A	F	F
Approach Delay (s)	1.0	0.5	75.6	104.4
Approach LOS			F	F

Intersection Summary				
Average Delay			3.0	
Intersection Capacity Utilization			80.5%	ICU Level of Service D
Analysis Period (min)			15	

Lanes, Volumes, Timings
3: Fox Farm Road & County Road 22/Country Road 22

11/15/2016

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1080	62	115	735	37	67
Future Volume (vph)	1080	62	115	735	37	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.993				0.913	
Flt Protected				0.993	0.983	
Satd. Flow (prot)	1814	0	0	1776	1686	0
Flt Permitted				0.993	0.983	
Satd. Flow (perm)	1814	0	0	1776	1686	0
Link Speed (k/h)	80			50	80	
Link Distance (m)	153.6			1063.4	320.8	
Travel Time (s)	6.9			76.6	14.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	0%	12%	4%	0%	0%
Adj. Flow (vph)	1137	65	121	774	39	71
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1202	0	0	895	110	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	121.8%	ICU Level of Service H	
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Fox Farm Road & County Road 22/Country Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1080	62	115	735	37	67
Future Volume (Veh/h)	1080	62	115	735	37	67
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1137	65	121	774	39	71
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			1202		2186	1170
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1202		2186	1170
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			78		2	70
cM capacity (veh/h)			547		40	237

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1202	895	110
Volume Left	0	121	39
Volume Right	65	0	71
cSH	1700	547	86
Volume to Capacity	0.71	0.22	1.28
Queue Length 95th (m)	0.0	6.7	64.9
Control Delay (s)	0.0	6.5	278.2
Lane LOS		A	F
Approach Delay (s)	0.0	6.5	278.2
Approach LOS			F

Intersection Summary			
Average Delay		16.5	
Intersection Capacity Utilization		121.8%	ICU Level of Service H
Analysis Period (min)		15	

Lanes, Volumes, Timings
4: Old Second Road

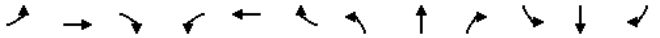
11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	1137	8	7	829	23	5	16	9	14	5	6
Future Volume (vph)	4	1137	8	7	829	23	5	16	9	14	5	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.996			0.961			0.969	
Flt Protected								0.992			0.972	
Satd. Flow (prot)	0	1787	0	0	1800	0	0	1727	0	0	1587	0
Flt Permitted								0.992			0.972	
Satd. Flow (perm)	0	1787	0	0	1800	0	0	1727	0	0	1587	0
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		1063.4			661.0			398.3			389.2	
Travel Time (s)		76.6			47.6			17.9			17.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	5%	16%	16%	4%	0%	7%	0%	9%	20%	0%	0%
Adj. Flow (vph)	4	1197	8	7	873	24	5	17	9	15	5	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1209	0	0	904	0	0	31	0	0	26	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 73.2%		ICU Level of Service D	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
4: Old Second Road

11/15/2016



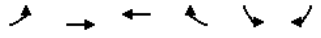
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	1137	8	7	829	23	5	16	9	14	5	6
Future Volume (Veh/h)	4	1137	8	7	829	23	5	16	9	14	5	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	1197	8	7	873	24	5	17	9	15	5	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	897			1205			2116	2120	1201	2126	2112	885
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	897			1205			2116	2120	1201	2126	2112	885
tC, single (s)	4.1			4.3			7.2	6.5	6.3	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.4	3.7	4.0	3.3
p0 queue free %	99			99			84	66	96	33	90	98
cM capacity (veh/h)	765			533			32	50	218	22	51	347

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	1209	904	31	26
Volume Left	4	7	5	15
Volume Right	8	24	9	6
cSH	765	533	58	33
Volume to Capacity	0.01	0.01	0.54	0.78
Queue Length 95th (m)	0.1	0.3	17.0	21.7
Control Delay (s)	0.2	0.4	124.5	266.8
Lane LOS	A	A	F	F
Approach Delay (s)	0.2	0.4	124.5	266.8
Approach LOS			F	F

Intersection Summary				
Average Delay			5.3	
Intersection Capacity Utilization			73.2%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
5: Country Road 22 & Highway 400 South Ramp

11/15/2016

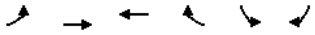


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	79	1065	726	184	16	117
Future Volume (vph)	79	1065	726	184	16	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.881	
Flt Protected		0.997			0.994	
Satd. Flow (prot)	0	1798	1824	1581	1583	0
Flt Permitted		0.997			0.994	
Satd. Flow (perm)	0	1798	1824	1581	1583	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		661.0	382.0		499.1	
Travel Time (s)		47.6	27.5		35.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	4%	3%	1%	25%	1%
Adj. Flow (vph)	83	1121	764	194	17	123
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1204	764	194	140	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	116.7%	ICU Level of Service H	
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: Country Road 22 & Highway 400 South Ramp

11/15/2016



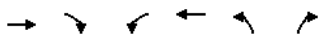
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	79	1065	726	184	16	117
Future Volume (Veh/h)	79	1065	726	184	16	117
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	83	1121	764	194	17	123
Pedestrians						
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	764				2051	764
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	764				2051	764
tC, single (s)	4.2				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.7	3.3
p0 queue free %	90				64	70
cM capacity (veh/h)	827				47	405

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	1204	764	194	140
Volume Left	83	0	0	17
Volume Right	0	0	194	123
cSH	827	1700	1700	212
Volume to Capacity	0.10	0.45	0.11	0.66
Queue Length 95th (m)	2.7	0.0	0.0	32.3
Control Delay (s)	3.4	0.0	0.0	50.1
Lane LOS	A			F
Approach Delay (s)	3.4	0.0		50.1
Approach LOS				F

Intersection Summary			
Average Delay	4.8		
Intersection Capacity Utilization	116.7%	ICU Level of Service	H
Analysis Period (min)	15		

Lanes, Volumes, Timings
6: Highway 400 North Ramp & County Road 22

11/15/2016



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	791	257	40	779	109	378
Future Volume (vph)	791	257	40	779	109	378
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.998	0.950	
Satd. Flow (prot)	1824	1581	0	1802	1785	1566
Flt Permitted				0.998	0.950	
Satd. Flow (perm)	1824	1581	0	1802	1785	1566
Link Speed (k/h)	50			80	50	
Link Distance (m)	382.0			36.2	392.3	
Travel Time (s)	27.5			1.6	28.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	1%	5%	4%	0%	2%
Adj. Flow (vph)	833	271	42	820	115	398
Shared Lane Traffic (%)						
Lane Group Flow (vph)	833	271	0	862	115	398
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	86.3%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6: Highway 400 North Ramp & County Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	791	257	40	779	109	378
Future Volume (Veh/h)	791	257	40	779	109	378
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	833	271	42	820	115	398
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			833		1737	833
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			833		1737	833
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		0	0
cM capacity (veh/h)			787		92	369

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2
Volume Total	833	271	862	115	398
Volume Left	0	0	42	115	0
Volume Right	0	271	0	0	398
cSH	1700	1700	787	92	369
Volume to Capacity	0.49	0.16	0.05	1.25	1.08
Queue Length 95th (m)	0.0	0.0	1.4	65.3	113.6
Control Delay (s)	0.0	0.0	1.4	259.3	104.0
Lane LOS			A	F	F
Approach Delay (s)	0.0		1.4	138.8	
Approach LOS				F	

Intersection Summary			
Average Delay	29.2		
Intersection Capacity Utilization	86.3%	ICU Level of Service	E
Analysis Period (min)	15		

Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	986	68	62	711	178	69	133	156	127	67	82
Future Volume (vph)	146	986	68	62	711	178	69	133	156	127	67	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	180.0		0.0	185.0		0.0	157.0		0.0	150.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990			0.970			0.919			0.918	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	1826	0	1733	1749	0	1623	1695	0	1785	1672	0
Flt Permitted	0.051			0.054			0.657			0.189		
Satd. Flow (perm)	95	1826	0	99	1749	0	1122	1695	0	355	1672	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			14			37			43	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1121.3			305.8			269.5			271.6	
Travel Time (s)		80.7			22.0			19.4			19.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	2%	0%	3%	4%	5%	10%	4%	0%	0%	7%	0%
Adj. Flow (vph)	154	1038	72	65	748	187	73	140	164	134	71	86
Shared Lane Traffic (%)												
Lane Group Flow (vph)	154	1110	0	65	935	0	73	304	0	134	157	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		pm+pt	NA	
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	9.5	24.0		9.5	24.0		26.0	26.0		9.5	26.0	
Total Split (s)	15.4	86.0		9.8	80.4		33.2	33.2		11.0	44.2	
Total Split (%)	11.0%	61.4%		7.0%	57.4%		23.7%	23.7%		7.9%	31.6%	
Maximum Green (s)	11.4	80.0		5.3	74.4		27.2	27.2		7.0	38.2	
Yellow Time (s)	3.0	4.0		3.5	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	1.0	2.0		1.0	2.0		2.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	6.0		4.5	6.0		6.0	6.0		4.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes		
Walk Time (s)		13.0			13.0		15.0	15.0			15.0	
Flash Dont Walk (s)		5.0			5.0		5.0	5.0			5.0	
Pedestrian Calls (#/hr)		0			0		0	0			0	
Act Effct Green (s)	91.8	80.0		81.2	74.4		27.2	27.2		40.2	38.2	
Actuated g/C Ratio	0.66	0.57		0.58	0.53		0.19	0.19		0.29	0.27	

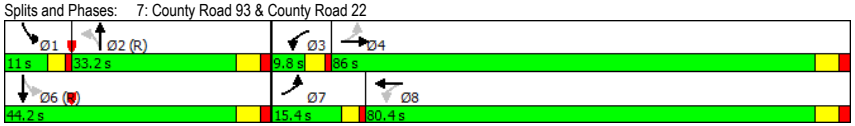
Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.78	1.06		0.55	1.00		0.34	0.85		0.77	0.32	
Control Delay	50.8	76.7		33.0	61.5		53.7	69.2		69.4	31.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	50.8	76.7		33.0	61.5		53.7	69.2		69.4	31.2	
LOS	D	E		C	E		D	E		E	C	
Approach Delay		73.6			59.7			66.2			48.8	
Approach LOS		E			E			E			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 130			
Control Type: Pretimed			
Maximum v/c Ratio: 1.06			
Intersection Signal Delay: 65.4		Intersection LOS: E	
Intersection Capacity Utilization 112.3%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 7: County Road 93 & County Road 22



Queues
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	154	1110	65	935	73	304	134	157
v/c Ratio	0.78	1.06	0.55	1.00	0.34	0.85	0.77	0.32
Control Delay	50.8	76.7	33.0	61.5	53.7	69.2	69.4	31.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.8	76.7	33.0	61.5	53.7	69.2	69.4	31.2
Queue Length 50th (m)	27.1	~356.7	6.4	261.7	18.5	76.6	30.2	26.2
Queue Length 95th (m)	m#42.3	m#404.0	18.6	#363.7	34.9	#126.8	#60.5	47.2
Internal Link Dist (m)		1097.3		281.8		245.5		247.6
Turn Bay Length (m)	180.0		185.0		157.0		150.0	
Base Capacity (vph)	198	1045	119	936	217	359	173	487
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	1.06	0.55	1.00	0.34	0.85	0.77	0.32

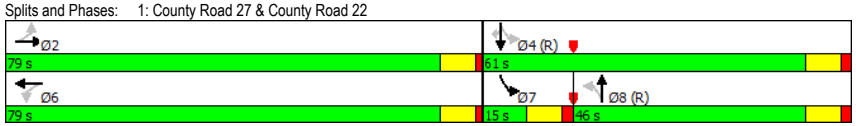
Intersection Summary	
~	Volume exceeds capacity, queue is theoretically infinite.
	Queue shown is maximum after two cycles.
#	95th percentile volume exceeds capacity, queue may be longer.
	Queue shown is maximum after two cycles.
m	Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	543	23	91	433	176	17	758	207	154	648	33
Future Volume (vph)	56	543	23	91	433	176	17	758	207	154	648	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	110.0		0.0	0.0		0.0	130.0		0.0	125.0		110.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.994			0.966			0.968				0.850
Flt Protected	0.950				0.994		0.950			0.950		
Satd. Flow (prot)	1767	1773	0	0	1712	0	1700	3456	0	1668	1842	1597
Flt Permitted	0.316				0.566		0.105			0.087		
Satd. Flow (perm)	588	1773	0	0	975	0	188	3456	0	153	1842	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			18			24				32
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		515.9			1538.1			209.3			305.4	
Travel Time (s)		23.2			69.2			9.4			13.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	5%	13%	8%	7%	0%	5%	0%	0%	7%	2%	0%
Adj. Flow (vph)	59	572	24	96	456	185	18	798	218	162	682	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	59	596	0	0	737	0	18	1016	0	162	682	35
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8			4		4
Minimum Split (s)	17.1	17.1		17.1	17.1		27.8	27.8		12.8	27.8	27.8
Total Split (s)	79.0	79.0		79.0	79.0		46.0	46.0		15.0	61.0	61.0
Total Split (%)	56.4%	56.4%		56.4%	56.4%		32.9%	32.9%		10.7%	43.6%	43.6%
Maximum Green (s)	71.9	71.9		71.9	71.9		38.2	38.2		7.2	53.2	53.2
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.2	1.2		1.2	1.2		1.9	1.9		1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1			7.1		7.8	7.8		7.8	7.8	7.8
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Act Effct Green (s)	71.9	71.9			71.9		38.2	38.2		53.2	53.2	53.2
Actuated g/C Ratio	0.51	0.51			0.51		0.27	0.27		0.38	0.38	0.38
v/c Ratio	0.20	0.65			1.45		0.35	1.06		1.19	0.98	0.06
Control Delay	20.6	29.1			240.9		63.4	92.9		168.7	71.4	9.9
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	20.6	29.1			240.9		63.4	92.9		168.7	71.4	9.9
LOS	C	C			F		E	F		F	E	A
Approach Delay		28.4			240.9			92.4			86.8	
Approach LOS		C			F			F			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green			
Natural Cycle: 150			
Control Type: Pretimed			
Maximum v/c Ratio: 1.45			
Intersection Signal Delay: 111.3		Intersection LOS: F	
Intersection Capacity Utilization 144.1%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 1: County Road 27 & County Road 22



Queues
1: County Road 27 & County Road 22

11/15/2016

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	59	596	737	18	1016	162	682	35
v/c Ratio	0.20	0.65	1.45	0.35	1.06	1.19	0.98	0.06
Control Delay	20.6	29.1	240.9	63.4	92.9	168.7	71.4	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.6	29.1	240.9	63.4	92.9	168.7	71.4	9.9
Queue Length 50th (m)	9.0	123.5	~290.9	4.3	~167.8	~41.4	194.5	0.5
Queue Length 95th (m)	18.9	166.8	#370.6	13.7	#212.4	#89.9	#278.2	8.1
Internal Link Dist (m)		491.9	1514.1		185.3		281.4	
Turn Bay Length (m)	110.0			130.0		125.0		110.0
Base Capacity (vph)	301	911	509	51	960	136	699	626
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.65	1.45	0.35	1.06	1.19	0.98	0.06

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Lanes, Volumes, Timings
2: Gill Road & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	906	18	14	698	10	11	3	9	15	0	12
Future Volume (vph)	13	906	18	14	698	10	11	3	9	15	0	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.9	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.998			0.949			0.939	
Flt Protected		0.999			0.999			0.976			0.973	
Satd. Flow (prot)	0	1817	0	0	1787	0	0	1623	0	0	1662	0
Flt Permitted		0.999			0.999			0.976			0.973	
Satd. Flow (perm)	0	1817	0	0	1787	0	0	1623	0	0	1662	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		1538.1			370.7			296.2			94.4	
Travel Time (s)		69.2			16.7			17.8			6.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	5%	0%	5%	0%	0%	0%	0%	6%	0%	0%
Adj. Flow (vph)	14	954	19	15	735	11	12	3	9	16	0	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	987	0	0	761	0	0	24	0	0	29	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.11	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 65.4% ICU Level of Service C
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
2: Gill Road & County Road 22

11/15/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	906	18	14	698	10	11	3	9	15	0	12
Future Volume (Veh/h)	13	906	18	14	698	10	11	3	9	15	0	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	14	954	19	15	735	11	12	3	9	16	0	13
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	746			973			1775	1768	964	1772	1772	740
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	746			973			1775	1768	964	1772	1772	740
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	98			98			80	96	97	72	100	97
cM capacity (veh/h)	871			717			61	81	313	58	81	420

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	987	761	24	29
Volume Left	14	15	12	16
Volume Right	19	11	9	13
cSH	871	717	92	94
Volume to Capacity	0.02	0.02	0.26	0.31
Queue Length 95th (m)	0.4	0.5	7.6	9.3
Control Delay (s)	0.5	0.6	57.5	59.2
Lane LOS	A	A	F	F
Approach Delay (s)	0.5	0.6	57.5	59.2
Approach LOS			F	F

Intersection Summary					
Average Delay			2.2		
Intersection Capacity Utilization			65.4%	ICU Level of Service	C
Analysis Period (min)			15		

Lanes, Volumes, Timings
3: Fox Farm Road & County Road 22/Country Road 22

11/15/2016

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	873	65	117	686	35	63
Future Volume (vph)	873	65	117	686	35	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.991				0.913	
Flt Protected				0.993	0.982	
Satd. Flow (prot)	1811	0	0	1774	1685	0
Flt Permitted				0.993	0.982	
Satd. Flow (perm)	1811	0	0	1774	1685	0
Link Speed (k/h)	80			50	80	
Link Distance (m)	153.6			1063.4	320.8	
Travel Time (s)	6.9			76.6	14.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	0%	12%	4%	0%	0%
Adj. Flow (vph)	919	68	123	722	37	66
Shared Lane Traffic (%)						
Lane Group Flow (vph)	987	0	0	845	103	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary				
Area Type:	Other			
Control Type: Unsignalized				
Intersection Capacity Utilization	108.3%		ICU Level of Service G	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
3: Fox Farm Road & County Road 22/Country Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	873	65	117	686	35	63
Future Volume (Veh/h)	873	65	117	686	35	63
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	919	68	123	722	37	66
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			987		1921	953
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			987		1921	953
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			81		39	79
cM capacity (veh/h)			662		61	317

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	987	845	103
Volume Left	0	123	37
Volume Right	68	0	66
cSH	1700	662	126
Volume to Capacity	0.58	0.19	0.82
Queue Length 95th (m)	0.0	5.4	39.5
Control Delay (s)	0.0	4.9	102.7
Lane LOS		A	F
Approach Delay (s)	0.0	4.9	102.7
Approach LOS			F

Intersection Summary			
Average Delay		7.6	
Intersection Capacity Utilization		108.3%	ICU Level of Service G
Analysis Period (min)		15	

Lanes, Volumes, Timings
4: Old Second Road

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	903	12	6	779	48	14	24	11	10	9	5
Future Volume (vph)	13	903	12	6	779	48	14	24	11	10	9	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.992			0.969			0.973	
Flt Protected		0.999						0.986			0.978	
Satd. Flow (prot)	0	1783	0	0	1795	0	0	1725	0	0	1643	0
Flt Permitted		0.999						0.986			0.978	
Satd. Flow (perm)	0	1783	0	0	1795	0	0	1725	0	0	1643	0
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		1063.4			661.0			398.3			389.2	
Travel Time (s)		76.6			47.6			17.9			17.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	5%	16%	16%	4%	0%	7%	0%	9%	20%	0%	0%
Adj. Flow (vph)	14	951	13	6	820	51	15	25	12	11	9	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	978	0	0	877	0	0	52	0	0	25	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 66.8%		ICU Level of Service C	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
4: Old Second Road

11/15/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	903	12	6	779	48	14	24	11	10	9	5
Future Volume (Veh/h)	13	903	12	6	779	48	14	24	11	10	9	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	14	951	13	6	820	51	15	25	12	11	9	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	871			964			1852	1868	958	1868	1850	846
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	871			964			1852	1868	958	1868	1850	846
tC, single (s)	4.1			4.3			7.2	6.5	6.3	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.4	3.7	4.0	3.3
p0 queue free %	98			99			69	65	96	68	88	99
cM capacity (veh/h)	783			661			48	71	303	34	73	365

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	978	877	52	25
Volume Left	14	6	15	11
Volume Right	13	51	12	5
cSH	783	661	74	54
Volume to Capacity	0.02	0.01	0.70	0.46
Queue Length 95th (m)	0.4	0.2	26.0	13.9
Control Delay (s)	0.5	0.3	127.3	118.3
Lane LOS	A	A	F	F
Approach Delay (s)	0.5	0.3	127.3	118.3
Approach LOS			F	F

Intersection Summary					
Average Delay			5.3		
Intersection Capacity Utilization			66.8%	ICU Level of Service	C
Analysis Period (min)			15		

Lanes, Volumes, Timings
5: Country Road 22 & Highway 400 South Ramp

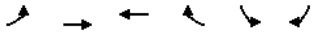
11/15/2016

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	100	820	708	221	12	116
Future Volume (vph)	100	820	708	221	12	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.878	
Flt Protected		0.995			0.995	
Satd. Flow (prot)	0	1792	1824	1581	1589	0
Flt Permitted		0.995			0.995	
Satd. Flow (perm)	0	1792	1824	1581	1589	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		661.0	382.0		499.1	
Travel Time (s)		47.6	27.5		35.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	4%	3%	1%	25%	1%
Adj. Flow (vph)	105	863	745	233	13	122
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	968	745	233	135	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	103.8%	ICU Level of Service G	
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: Country Road 22 & Highway 400 South Ramp

11/15/2016



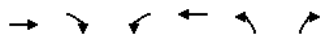
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	100	820	708	221	12	116
Future Volume (Veh/h)	100	820	708	221	12	116
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	105	863	745	233	13	122
Pedestrians						
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	745				1818	745
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	745				1818	745
tC, single (s)	4.2				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.7	3.3
p0 queue free %	88				80	71
cM capacity (veh/h)	841				65	416

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	968	745	233	135
Volume Left	105	0	0	13
Volume Right	0	0	233	122
cSH	841	1700	1700	274
Volume to Capacity	0.12	0.44	0.14	0.49
Queue Length 95th (m)	3.4	0.0	0.0	20.3
Control Delay (s)	3.3	0.0	0.0	30.2
Lane LOS	A			D
Approach Delay (s)	3.3	0.0		30.2
Approach LOS				D

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	103.8%	ICU Level of Service	G
Analysis Period (min)	15		

Lanes, Volumes, Timings
6: Highway 400 North Ramp & County Road 22

11/15/2016



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	706	111	38	789	132	406
Future Volume (vph)	706	111	38	789	132	406
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.998	0.950	
Satd. Flow (prot)	1824	1581	0	1802	1785	1566
Flt Permitted				0.998	0.950	
Satd. Flow (perm)	1824	1581	0	1802	1785	1566
Link Speed (k/h)	50			80	50	
Link Distance (m)	382.0			36.2	392.3	
Travel Time (s)	27.5			1.6	28.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	1%	5%	4%	0%	2%
Adj. Flow (vph)	743	117	40	831	139	427
Shared Lane Traffic (%)						
Lane Group Flow (vph)	743	117	0	871	139	427
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	86.4%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6: Highway 400 North Ramp & County Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	706	111	38	789	132	406
Future Volume (Veh/h)	706	111	38	789	132	406
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	743	117	40	831	139	427
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			743		1654	743
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			743		1654	743
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		0	0
cM capacity (veh/h)			851		104	415

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2
Volume Total	743	117	871	139	427
Volume Left	0	0	40	139	0
Volume Right	0	117	0	0	427
cSH	1700	1700	851	104	415
Volume to Capacity	0.44	0.07	0.05	1.33	1.03
Queue Length 95th (m)	0.0	0.0	1.2	77.8	107.4
Control Delay (s)	0.0	0.0	1.3	277.4	83.8
Lane LOS			A	F	F
Approach Delay (s)	0.0		1.3	131.4	
Approach LOS				F	

Intersection Summary			
Average Delay	32.8		
Intersection Capacity Utilization	86.4%	ICU Level of Service	E
Analysis Period (min)	15		

Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	157	927	69	68	689	197	29	114	198	123	82	93
Future Volume (vph)	157	927	69	68	689	197	29	114	198	123	82	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	180.0		0.0	185.0		0.0	157.0		0.0	150.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990			0.967			0.905			0.920	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	1826	0	1733	1743	0	1623	1676	0	1785	1674	0
Flt Permitted	0.131			0.083			0.615			0.355		
Satd. Flow (perm)	244	1826	0	151	1743	0	1050	1676	0	667	1674	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8			32			104			68	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1121.3			305.8			269.5			271.6	
Travel Time (s)		80.7			22.0			19.4			19.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	2%	0%	3%	4%	5%	10%	4%	0%	0%	7%	0%
Adj. Flow (vph)	165	976	73	72	725	207	31	120	208	129	86	98
Shared Lane Traffic (%)												
Lane Group Flow (vph)	165	1049	0	72	932	0	31	328	0	129	184	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	24.0	24.0		24.0	24.0		26.0	26.0		26.0	26.0	
Total Split (s)	54.0	54.0		54.0	54.0		26.0	26.0		26.0	26.0	
Total Split (%)	67.5%	67.5%		67.5%	67.5%		32.5%	32.5%		32.5%	32.5%	
Maximum Green (s)	48.0	48.0		48.0	48.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	13.0	13.0		13.0	13.0		15.0	15.0		15.0	15.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	48.0	48.0		48.0	48.0		20.0	20.0		20.0	20.0	
Actuated g/C Ratio	0.60	0.60		0.60	0.60		0.25	0.25		0.25	0.25	

Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	1.13	0.96		0.80	0.88		0.12	0.66		0.78	0.39	
Control Delay	136.9	35.2		73.5	25.2		24.7	25.4		60.9	18.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	136.9	35.2		73.5	25.2		24.7	25.4		60.9	18.4	
LOS	F	D		E	C		C	C		E	B	
Approach Delay		49.1			28.7			25.4			35.9	
Approach LOS		D			C			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Pretimed			
Maximum v/c Ratio: 1.13			
Intersection Signal Delay: 37.6		Intersection LOS: D	
Intersection Capacity Utilization 122.8%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 7: County Road 93 & County Road 22

Queues
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	165	1049	72	932	31	328	129	184
v/c Ratio	1.13	0.96	0.80	0.88	0.12	0.66	0.78	0.39
Control Delay	136.9	35.2	73.5	25.2	24.7	25.4	60.9	18.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	136.9	35.2	73.5	25.2	24.7	25.4	60.9	18.4
Queue Length 50th (m)	~31.0	141.3	8.0	111.1	3.8	31.7	19.2	15.0
Queue Length 95th (m)	#45.8	#242.8	#35.1	#205.6	10.8	60.2	#49.2	33.0
Internal Link Dist (m)		1097.3		281.8		245.5		247.6
Turn Bay Length (m)	180.0		185.0		157.0		150.0	
Base Capacity (vph)	146	1098	90	1058	262	497	166	469
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.13	0.96	0.80	0.88	0.12	0.66	0.78	0.39

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

APPENDIX G

Total Future Intersection Capacity Analysis
Boundary Intersections

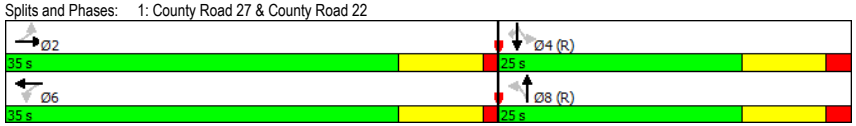
MMM GROUP

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	200	17	75	300	112	23	353	83	74	306	40
Future Volume (vph)	40	200	17	75	300	112	23	353	83	74	306	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	110.0		0.0	0.0		0.0	130.0		0.0	125.0		110.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			0.0			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.988			0.969			0.972				0.850
Flt Protected	0.950				0.992		0.950			0.950		
Satd. Flow (prot)	1767	1757	0	0	1711	0	1700	3470	0	1668	1842	1597
Flt Permitted	0.457				0.907		0.515			0.488		
Satd. Flow (perm)	850	1757	0	0	1565	0	922	3470	0	857	1842	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			34			47				75
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		515.9			1538.1			209.3			305.4	
Travel Time (s)		23.2			69.2			9.4			13.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	5%	13%	8%	7%	0%	5%	0%	0%	7%	2%	0%
Adj. Flow (vph)	42	211	18	79	316	118	24	372	87	78	322	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	229	0	0	513	0	24	459	0	78	322	42
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		4
Minimum Split (s)	27.8	27.8		27.8	27.8		17.8	17.8		17.8	17.8	17.8
Total Split (s)	35.0	35.0		35.0	35.0		25.0	25.0		25.0	25.0	25.0
Total Split (%)	58.3%	58.3%		58.3%	58.3%		41.7%	41.7%		41.7%	41.7%	41.7%
Maximum Green (s)	27.9	27.9		27.9	27.9		17.2	17.2		17.2	17.2	17.2
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.2	1.2		1.2	1.2		1.9	1.9		1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1			7.1		7.8	7.8		7.8	7.8	7.8
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)	27.9	27.9			27.9		17.2	17.2		17.2	17.2	17.2
Actuated g/C Ratio	0.46	0.46			0.46		0.29	0.29		0.29	0.29	0.29
v/c Ratio	0.11	0.28			0.69		0.09	0.45		0.32	0.61	0.08
Control Delay	10.0	10.6			17.6		16.9	17.3		21.2	24.3	2.4
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	10.0	10.6			17.6		16.9	17.3		21.2	24.3	2.4
LOS	A	B			B		B	B		C	C	A
Approach Delay		10.5			17.6			17.3			21.7	
Approach LOS		B			B			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green			
Natural Cycle: 55			
Control Type: Pretimed			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 17.4		Intersection LOS: B	
Intersection Capacity Utilization 92.7%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: County Road 27 & County Road 22

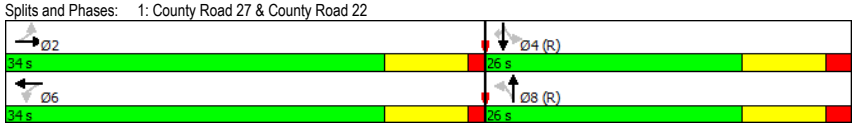


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	516	16	58	325	122	27	520	169	107	266	66
Future Volume (vph)	57	516	16	58	325	122	27	520	169	107	266	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	110.0		0.0	0.0		0.0	130.0		0.0	125.0		110.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			0.0			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.995			0.967			0.963				0.850
Flt Protected	0.950				0.994		0.950			0.950		
Satd. Flow (prot)	1767	1776	0	0	1713	0	1700	3438	0	1668	1842	1597
Flt Permitted	0.435				0.763		0.588			0.305		
Satd. Flow (perm)	809	1776	0	0	1315	0	1052	3438	0	536	1842	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			35			75				75
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		515.9			1538.1			209.3			305.4	
Travel Time (s)		23.2			69.2			9.4			13.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	5%	13%	8%	7%	0%	5%	0%	0%	7%	2%	0%
Adj. Flow (vph)	60	543	17	61	342	128	28	547	178	113	280	69
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	560	0	0	531	0	28	725	0	113	280	69
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		4
Minimum Split (s)	27.8	27.8		27.8	27.8		17.8	17.8		17.8	17.8	17.8
Total Split (s)	34.0	34.0		34.0	34.0		26.0	26.0		26.0	26.0	26.0
Total Split (%)	56.7%	56.7%		56.7%	56.7%		43.3%	43.3%		43.3%	43.3%	43.3%
Maximum Green (s)	26.9	26.9		26.9	26.9		18.2	18.2		18.2	18.2	18.2
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.2	1.2		1.2	1.2		1.9	1.9		1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1			7.1		7.8	7.8		7.8	7.8	7.8
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)	26.9	26.9			26.9		18.2	18.2		18.2	18.2	18.2
Actuated g/C Ratio	0.45	0.45			0.45		0.30	0.30		0.30	0.30	0.30
v/c Ratio	0.17	0.70			0.87		0.09	0.66		0.70	0.50	0.13
Control Delay	11.4	19.1			32.9		16.0	19.7		45.7	21.0	4.9
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	11.4	19.1			32.9		16.0	19.7		45.7	21.0	4.9
LOS	B	B			C		B	B		D	C	A
Approach Delay		18.4			32.9			19.6			24.6	
Approach LOS		B			C			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green			
Natural Cycle: 65			
Control Type: Pretimed			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 23.2		Intersection LOS: C	
Intersection Capacity Utilization 108.8%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 1: County Road 27 & County Road 22



Queues
1: County Road 27 & County Road 22

11/15/2016

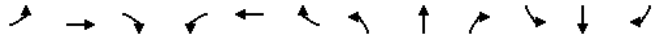
Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	60	560	531	28	725	113	280	69
v/c Ratio	0.17	0.70	0.87	0.09	0.66	0.70	0.50	0.13
Control Delay	11.4	19.1	32.9	16.0	19.7	45.7	21.0	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.4	19.1	32.9	16.0	19.7	45.7	21.0	4.9
Queue Length 50th (m)	3.9	49.0	49.4	2.3	33.8	11.4	26.3	0.0
Queue Length 95th (m)	10.5	82.7	#107.9	7.5	50.7	#35.3	46.5	7.0
Internal Link Dist (m)		491.9	1514.1		185.3		281.4	
Turn Bay Length (m)	110.0			130.0		125.0		110.0
Base Capacity (vph)	362	797	608	319	1095	162	558	536
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.70	0.87	0.09	0.66	0.70	0.50	0.13

Intersection Summary

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

Lanes, Volumes, Timings
2: Gill Road & County Road 22

11/15/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	805	10	12	544	17	3	2	2	18	1	18
Future Volume (vph)	21	805	10	12	544	17	3	2	2	18	1	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.9	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.996			0.961			0.934	
Flt Protected		0.999			0.999			0.979			0.976	
Satd. Flow (prot)	0	1820	0	0	1785	0	0	1649	0	0	1664	0
Flt Permitted		0.999			0.999			0.979			0.976	
Satd. Flow (perm)	0	1820	0	0	1785	0	0	1649	0	0	1664	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		1538.1			370.7			296.2			94.4	
Travel Time (s)		69.2			16.7			17.8			6.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	5%	0%	5%	0%	0%	0%	0%	6%	0%	0%
Adj. Flow (vph)	22	847	11	13	573	18	3	2	2	19	1	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	880	0	0	604	0	0	7	0	0	39	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.11	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
2: Gill Road & County Road 22

11/15/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	805	10	12	544	17	3	2	2	18	1	18
Future Volume (Veh/h)	21	805	10	12	544	17	3	2	2	18	1	18
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	22	847	11	13	573	18	3	2	2	19	1	19
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	591			858			1524	1514	852	1508	1510	582
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	591			858			1524	1514	852	1508	1510	582
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	98			98			97	98	99	79	99	96
cM capacity (veh/h)	995			791			91	116	362	93	117	517

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	880	604	7	39
Volume Left	22	13	3	19
Volume Right	11	18	2	19
cSH	995	791	125	156
Volume to Capacity	0.02	0.02	0.06	0.25
Queue Length 95th (m)	0.5	0.4	1.4	7.5
Control Delay (s)	0.6	0.4	35.4	35.7
Lane LOS	A	A	E	E
Approach Delay (s)	0.6	0.4	35.4	35.7
Approach LOS			E	E

Intersection Summary				
Average Delay			1.6	
Intersection Capacity Utilization			63.5%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
3: Fox Farm Road & County Road 22/Country Road 22

11/15/2016

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	854	8	11	570	5	10
Future Volume (vph)	854	8	11	570	5	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999				0.907	
Flt Protected				0.999	0.985	
Satd. Flow (prot)	1823	0	0	1802	1679	0
Flt Permitted				0.999	0.985	
Satd. Flow (perm)	1823	0	0	1802	1679	0
Link Speed (k/h)	80			50	80	
Link Distance (m)	153.6			1063.4	320.8	
Travel Time (s)	6.9			76.6	14.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	0%	12%	4%	0%	0%
Adj. Flow (vph)	899	8	12	600	5	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	907	0	0	612	16	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	55.4%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Fox Farm Road & County Road 22/Country Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	854	8	11	570	5	10
Future Volume (Veh/h)	854	8	11	570	5	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	899	8	12	600	5	11
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			907		1527	903
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			907		1527	903
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			98		96	97
cM capacity (veh/h)			710		129	339

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	907	612	16
Volume Left	0	12	5
Volume Right	8	0	11
cSH	1700	710	224
Volume to Capacity	0.53	0.02	0.07
Queue Length 95th (m)	0.0	0.4	1.8
Control Delay (s)	0.0	0.5	22.3
Lane LOS		A	C
Approach Delay (s)	0.0	0.5	22.3
Approach LOS			C

Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization		55.4%	ICU Level of Service B
Analysis Period (min)		15	

Lanes, Volumes, Timings
4: Old Second Road

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	854	8	7	561	23	5	16	9	14	5	6
Future Volume (vph)	4	854	8	7	561	23	5	16	9	14	5	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.995			0.961			0.969	
Flt Protected					0.999			0.992			0.972	
Satd. Flow (prot)	0	1786	0	0	1796	0	0	1727	0	0	1587	0
Flt Permitted					0.999			0.992			0.972	
Satd. Flow (perm)	0	1786	0	0	1796	0	0	1727	0	0	1587	0
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		1063.4			661.0			398.3			389.2	
Travel Time (s)		76.6			47.6			17.9			17.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	5%	16%	16%	4%	0%	7%	0%	9%	20%	0%	0%
Adj. Flow (vph)	4	899	8	7	591	24	5	17	9	15	5	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	911	0	0	622	0	0	31	0	0	26	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 58.1%		ICU Level of Service B	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
4: Old Second Road

11/15/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	854	8	7	561	23	5	16	9	14	5	6
Future Volume (Veh/h)	4	854	8	7	561	23	5	16	9	14	5	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	899	8	7	591	24	5	17	9	15	5	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	615			907			1536	1540	903	1546	1532	603
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	615			907			1536	1540	903	1546	1532	603
tC, single (s)	4.1			4.3			7.2	6.5	6.3	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.4	3.7	4.0	3.3
p0 queue free %	100			99			94	85	97	79	96	99
cM capacity (veh/h)	974			695			87	115	326	72	116	503

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	911	622	31	26
Volume Left	4	7	5	15
Volume Right	8	24	9	6
cSH	974	695	133	99
Volume to Capacity	0.00	0.01	0.23	0.26
Queue Length 95th (m)	0.1	0.2	6.8	7.7
Control Delay (s)	0.1	0.3	40.1	53.8
Lane LOS	A	A	E	F
Approach Delay (s)	0.1	0.3	40.1	53.8
Approach LOS			E	F

Intersection Summary					
Average Delay			1.8		
Intersection Capacity Utilization			58.1%	ICU Level of Service	B
Analysis Period (min)			15		

Lanes, Volumes, Timings
5: Country Road 22 & Highway 400 South Ramp

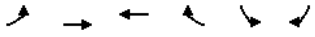
11/15/2016

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	136	729	490	123	11	99
Future Volume (vph)	136	729	490	123	11	99
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.879	
Flt Protected		0.992			0.995	
Satd. Flow (prot)	0	1784	1824	1581	1588	0
Flt Permitted		0.992			0.995	
Satd. Flow (perm)	0	1784	1824	1581	1588	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		661.0	382.0		499.1	
Travel Time (s)		47.6	27.5		35.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	4%	3%	1%	25%	1%
Adj. Flow (vph)	143	767	516	129	12	104
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	910	516	129	116	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary				
Area Type:	Other			
Control Type: Unsignalized				
Intersection Capacity Utilization	88.4%		ICU Level of Service	E
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
5: Country Road 22 & Highway 400 South Ramp

11/15/2016



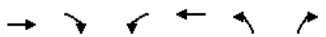
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	136	729	490	123	11	99
Future Volume (Veh/h)	136	729	490	123	11	99
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	143	767	516	129	12	104
Pedestrians						
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	516				1569	516
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	516				1569	516
tC, single (s)	4.2				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.7	3.3
p0 queue free %	86				87	81
cM capacity (veh/h)	1025				93	561

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	910	516	129	116
Volume Left	143	0	0	12
Volume Right	0	0	129	104
cSH	1025	1700	1700	368
Volume to Capacity	0.14	0.30	0.08	0.31
Queue Length 95th (m)	3.9	0.0	0.0	10.6
Control Delay (s)	3.4	0.0	0.0	19.2
Lane LOS	A			C
Approach Delay (s)	3.4	0.0		19.2
Approach LOS				C

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	88.4%	ICU Level of Service	E
Analysis Period (min)	15		

Lanes, Volumes, Timings
6: Highway 400 North Ramp & County Road 22

11/15/2016



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	492	241	30	506	89	265
Future Volume (vph)	492	241	30	506	89	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.997	0.950	
Satd. Flow (prot)	1824	1581	0	1800	1785	1566
Flt Permitted				0.997	0.950	
Satd. Flow (perm)	1824	1581	0	1800	1785	1566
Link Speed (k/h)	50			80	50	
Link Distance (m)	382.0			36.2	392.3	
Travel Time (s)	27.5			1.6	28.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	1%	5%	4%	0%	2%
Adj. Flow (vph)	518	254	32	533	94	279
Shared Lane Traffic (%)						
Lane Group Flow (vph)	518	254	0	565	94	279
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	62.8%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6: Highway 400 North Ramp & County Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	492	241	30	506	89	265
Future Volume (Veh/h)	492	241	30	506	89	265
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	518	254	32	533	94	279
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			518		1115	518
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			518		1115	518
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		58	50
cM capacity (veh/h)			1033		225	558

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2
Volume Total	518	254	565	94	279
Volume Left	0	0	32	94	0
Volume Right	0	254	0	0	279
cSH	1700	1700	1033	225	558
Volume to Capacity	0.30	0.15	0.03	0.42	0.50
Queue Length 95th (m)	0.0	0.0	0.8	15.4	22.3
Control Delay (s)	0.0	0.0	0.9	32.0	17.7
Lane LOS			A	D	C
Approach Delay (s)	0.0		0.9	21.3	
Approach LOS				C	

Intersection Summary				
Average Delay	4.9			
Intersection Capacity Utilization	62.8%	ICU Level of Service		B
Analysis Period (min)	15			

Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	661	68	41	486	91	69	113	98	69	55	29
Future Volume (vph)	53	661	68	41	486	91	69	113	98	69	55	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	180.0		0.0	185.0		0.0	157.0		0.0	150.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.986			0.976			0.930			0.948	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	1820	0	1733	1761	0	1623	1711	0	1785	1703	0
Flt Permitted	0.274			0.143			0.699			0.620		
Satd. Flow (perm)	510	1820	0	261	1761	0	1194	1711	0	1165	1703	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			21			78			31	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1121.3			305.8			269.5			271.6	
Travel Time (s)		80.7			22.0			19.4			19.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	2%	0%	3%	4%	5%	10%	4%	0%	0%	7%	0%
Adj. Flow (vph)	56	696	72	43	512	96	73	119	103	73	58	31
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	768	0	43	608	0	73	222	0	73	89	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	24.0	24.0		24.0	24.0		26.0	26.0		26.0	26.0	
Total Split (s)	34.0	34.0		34.0	34.0		26.0	26.0		26.0	26.0	
Total Split (%)	56.7%	56.7%		56.7%	56.7%		43.3%	43.3%		43.3%	43.3%	
Maximum Green (s)	28.0	28.0		28.0	28.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	13.0	13.0		13.0	13.0		15.0	15.0		15.0	15.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	28.0	28.0		28.0	28.0		20.0	20.0		20.0	20.0	
Actuated g/C Ratio	0.47	0.47		0.47	0.47		0.33	0.33		0.33	0.33	

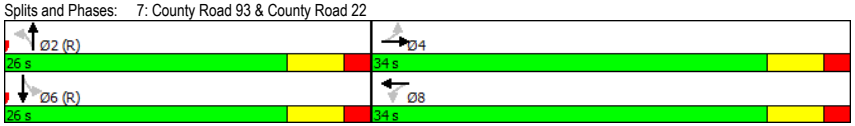
Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.24	0.90		0.36	0.73		0.18	0.36		0.19	0.15	
Control Delay	12.8	31.1		20.5	19.0		15.8	11.6		15.9	10.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	12.8	31.1		20.5	19.0		15.8	11.6		15.9	10.9	
LOS	B	C		C	B		B	B		B	B	
Approach Delay		29.9			19.1			12.7			13.1	
Approach LOS		C			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 22.2		Intersection LOS: C	
Intersection Capacity Utilization 92.4%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 7: County Road 93 & County Road 22



Queues
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	56	768	43	608	73	222	73	89
v/c Ratio	0.24	0.90	0.36	0.73	0.18	0.36	0.19	0.15
Control Delay	12.8	31.1	20.5	19.0	15.8	11.6	15.9	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.8	31.1	20.5	19.0	15.8	11.6	15.9	10.9
Queue Length 50th (m)	3.6	75.4	3.0	51.4	5.9	11.9	5.9	4.6
Queue Length 95th (m)	10.7	#145.3	11.7	88.1	14.4	27.0	14.4	13.1
Internal Link Dist (m)		1097.3		281.8		245.5		247.6
Turn Bay Length (m)	180.0		185.0		157.0		150.0	
Base Capacity (vph)	238	855	121	833	398	622	388	588
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.90	0.36	0.73	0.18	0.36	0.19	0.15

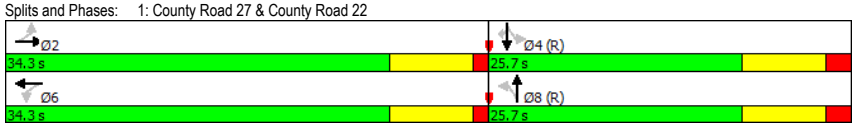
Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	374	23	70	315	135	17	447	158	108	344	33
Future Volume (vph)	56	374	23	70	315	135	17	447	158	108	344	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	110.0		0.0	0.0		0.0	130.0		0.0	125.0		110.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			0.0			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.991			0.965			0.961				0.850
Flt Protected	0.950				0.993		0.950			0.950		
Satd. Flow (prot)	1767	1766	0	0	1709	0	1700	3431	0	1668	1842	1597
Flt Permitted	0.429				0.884		0.460			0.368		
Satd. Flow (perm)	798	1766	0	0	1522	0	823	3431	0	646	1842	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			38			84				75
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		515.9			1538.1			209.3			305.4	
Travel Time (s)		23.2			69.2			9.4			13.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	5%	13%	8%	7%	0%	5%	0%	0%	7%	2%	0%
Adj. Flow (vph)	59	394	24	74	332	142	18	471	166	114	362	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	59	418	0	0	548	0	18	637	0	114	362	35
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		4
Minimum Split (s)	27.8	27.8		27.8	27.8		17.8	17.8		17.8	17.8	17.8
Total Split (s)	34.3	34.3		34.3	34.3		25.7	25.7		25.7	25.7	25.7
Total Split (%)	57.2%	57.2%		57.2%	57.2%		42.8%	42.8%		42.8%	42.8%	42.8%
Maximum Green (s)	27.2	27.2		27.2	27.2		17.9	17.9		17.9	17.9	17.9
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.2	1.2		1.2	1.2		1.9	1.9		1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1			7.1		7.8	7.8		7.8	7.8	7.8
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)	27.2	27.2			27.2		17.9	17.9		17.9	17.9	17.9
Actuated g/C Ratio	0.45	0.45			0.45		0.30	0.30		0.30	0.30	0.30
v/c Ratio	0.16	0.52			0.77		0.07	0.59		0.59	0.66	0.07
Control Delay	11.2	14.4			22.4		16.2	18.1		34.1	25.2	1.7
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	11.2	14.4			22.4		16.2	18.1		34.1	25.2	1.7
LOS	B	B			C		B	B		C	C	A
Approach Delay		14.0			22.4			18.0			25.6	
Approach LOS		B			C			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green			
Natural Cycle: 55			
Control Type: Pretimed			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 20.0		Intersection LOS: B	
Intersection Capacity Utilization 101.0%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 1: County Road 27 & County Road 22



Queues
1: County Road 27 & County Road 22

11/15/2016

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	59	418	548	18	637	114	362	35
v/c Ratio	0.16	0.52	0.77	0.07	0.59	0.59	0.66	0.07
Control Delay	11.2	14.4	22.4	16.2	18.1	34.1	25.2	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.2	14.4	22.4	16.2	18.1	34.1	25.2	1.7
Queue Length 50th (m)	3.8	32.1	46.8	1.5	27.9	11.1	36.2	0.0
Queue Length 95th (m)	10.2	55.0	#98.7	5.7	43.1	#32.1	62.0	2.0
Internal Link Dist (m)		491.9	1514.1		185.3		281.4	
Turn Bay Length (m)	110.0			130.0		125.0		110.0
Base Capacity (vph)	361	804	710	245	1082	192	549	529
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.52	0.77	0.07	0.59	0.59	0.66	0.07

Intersection Summary

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

Lanes, Volumes, Timings
2: Gill Road & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	630	18	16	508	10	11	3	9	15	0	12
Future Volume (vph)	13	630	18	16	508	10	11	3	9	15	0	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.9	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.997			0.949			0.939	
Flt Protected		0.999			0.998			0.976			0.973	
Satd. Flow (prot)	0	1815	0	0	1785	0	0	1623	0	0	1662	0
Flt Permitted		0.999			0.998			0.976			0.973	
Satd. Flow (perm)	0	1815	0	0	1785	0	0	1623	0	0	1662	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		1538.1			370.7			296.2			94.4	
Travel Time (s)		69.2			16.7			17.8			6.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	5%	0%	5%	0%	0%	0%	0%	6%	0%	0%
Adj. Flow (vph)	14	663	19	17	535	11	12	3	9	16	0	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	696	0	0	563	0	0	24	0	0	29	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.11	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 49.8% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
2: Gill Road & County Road 22

11/15/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	630	18	16	508	10	11	3	9	15	0	12
Future Volume (Veh/h)	13	630	18	16	508	10	11	3	9	15	0	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	14	663	19	17	535	11	12	3	9	16	0	13
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	546			682			1288	1280	672	1286	1284	540
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	546			682			1288	1280	672	1286	1284	540
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	99			98			91	98	98	88	100	98
cM capacity (veh/h)	1033			920			135	162	459	131	161	545

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	696	563	24	29
Volume Left	14	17	12	16
Volume Right	19	11	9	13
cSH	1033	920	189	198
Volume to Capacity	0.01	0.02	0.13	0.15
Queue Length 95th (m)	0.3	0.5	3.4	4.0
Control Delay (s)	0.4	0.5	26.8	26.2
Lane LOS	A	A	D	D
Approach Delay (s)	0.4	0.5	26.8	26.2
Approach LOS			D	D

Intersection Summary					
Average Delay			1.5		
Intersection Capacity Utilization			49.8%	ICU Level of Service	A
Analysis Period (min)			15		

Lanes, Volumes, Timings
3: Fox Farm Road & County Road 22/Country Road 22

11/15/2016

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	665	11	13	525	3	6
Future Volume (vph)	665	11	13	525	3	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.998				0.910	
Flt Protected				0.999	0.984	
Satd. Flow (prot)	1821	0	0	1801	1682	0
Flt Permitted				0.999	0.984	
Satd. Flow (perm)	1821	0	0	1801	1682	0
Link Speed (k/h)	80			50	80	
Link Distance (m)	153.6			1063.4	320.8	
Travel Time (s)	6.9			76.6	14.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	0%	12%	4%	0%	0%
Adj. Flow (vph)	700	12	14	553	3	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	712	0	0	567	9	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Fox Farm Road & County Road 22/Country Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	665	11	13	525	3	6
Future Volume (Veh/h)	665	11	13	525	3	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	700	12	14	553	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			712		1287	706
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			712		1287	706
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			98		98	99
cM capacity (veh/h)			843		180	439

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	712	567	9
Volume Left	0	14	3
Volume Right	12	0	6
cSH	1700	843	297
Volume to Capacity	0.42	0.02	0.03
Queue Length 95th (m)	0.0	0.4	0.7
Control Delay (s)	0.0	0.5	17.5
Lane LOS		A	C
Approach Delay (s)	0.0	0.5	17.5
Approach LOS			C

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	48.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
4: Old Second Road

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	641	12	6	515	48	14	24	11	10	9	5
Future Volume (vph)	13	641	12	6	515	48	14	24	11	10	9	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.989			0.969			0.973	
Flt Protected		0.999			0.999			0.986			0.978	
Satd. Flow (prot)	0	1781	0	0	1789	0	0	1725	0	0	1643	0
Flt Permitted		0.999			0.999			0.986			0.978	
Satd. Flow (perm)	0	1781	0	0	1789	0	0	1725	0	0	1643	0
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		1063.4			661.0			398.3			389.2	
Travel Time (s)		76.6			47.6			17.9			17.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	5%	16%	16%	4%	0%	7%	0%	9%	20%	0%	0%
Adj. Flow (vph)	14	675	13	6	542	51	15	25	12	11	9	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	702	0	0	599	0	0	52	0	0	25	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	52.4%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
4: Old Second Road

11/15/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	641	12	6	515	48	14	24	11	10	9	5
Future Volume (Veh/h)	13	641	12	6	515	48	14	24	11	10	9	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	14	675	13	6	542	51	15	25	12	11	9	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	593			688			1298	1314	682	1314	1296	568
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	593			688			1298	1314	682	1314	1296	568
tC, single (s)	4.1			4.3			7.2	6.5	6.3	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.4	3.7	4.0	3.3
p0 queue free %	99			99			88	84	97	89	94	99
cM capacity (veh/h)	993			844			126	156	438	104	160	527

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	702	599	52	25
Volume Left	14	6	15	11
Volume Right	13	51	12	5
cSH	993	844	170	146
Volume to Capacity	0.01	0.01	0.31	0.17
Queue Length 95th (m)	0.3	0.2	9.8	4.8
Control Delay (s)	0.4	0.2	35.3	34.7
Lane LOS	A	A	E	D
Approach Delay (s)	0.4	0.2	35.3	34.7
Approach LOS			E	D

Intersection Summary				
Average Delay			2.2	
Intersection Capacity Utilization			52.4%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
5: Country Road 22 & Highway 400 South Ramp

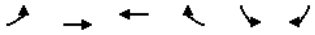
11/15/2016

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	157	506	474	160	7	98
Future Volume (vph)	157	506	474	160	7	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.874	
Flt Protected		0.988			0.997	
Satd. Flow (prot)	0	1773	1824	1581	1597	0
Flt Permitted		0.988			0.997	
Satd. Flow (perm)	0	1773	1824	1581	1597	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		661.0	382.0		499.1	
Travel Time (s)		47.6	27.5		35.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	4%	3%	1%	25%	1%
Adj. Flow (vph)	165	533	499	168	7	103
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	698	499	168	110	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: Country Road 22 & Highway 400 South Ramp

11/15/2016



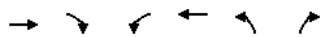
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	157	506	474	160	7	98
Future Volume (Veh/h)	157	506	474	160	7	98
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	165	533	499	168	7	103
Pedestrians						
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	499				1362	499
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	499				1362	499
tC, single (s)	4.2				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.7	3.3
p0 queue free %	84				94	82
cM capacity (veh/h)	1040				123	574

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	698	499	168	110
Volume Left	165	0	0	7
Volume Right	0	0	168	103
cSH	1040	1700	1700	465
Volume to Capacity	0.16	0.29	0.10	0.24
Queue Length 95th (m)	4.5	0.0	0.0	7.3
Control Delay (s)	3.8	0.0	0.0	15.1
Lane LOS	A			C
Approach Delay (s)	3.8	0.0		15.1
Approach LOS				C

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		

Lanes, Volumes, Timings
6: Highway 400 North Ramp & County Road 22

11/15/2016



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	414	95	28	516	112	293
Future Volume (vph)	414	95	28	516	112	293
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.997	0.950	
Satd. Flow (prot)	1824	1581	0	1800	1785	1566
Flt Permitted				0.997	0.950	
Satd. Flow (perm)	1824	1581	0	1800	1785	1566
Link Speed (k/h)	50			80	50	
Link Distance (m)	382.0			36.2	392.3	
Travel Time (s)	27.5			1.6	28.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	1%	5%	4%	0%	2%
Adj. Flow (vph)	436	100	29	543	118	308
Shared Lane Traffic (%)						
Lane Group Flow (vph)	436	100	0	572	118	308
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6: Highway 400 North Ramp & County Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	414	95	28	516	112	293
Future Volume (Veh/h)	414	95	28	516	112	293
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	436	100	29	543	118	308
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			436		1037	436
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			436		1037	436
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		53	50
cM capacity (veh/h)			1108		252	620

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2
Volume Total	436	100	572	118	308
Volume Left	0	0	29	118	0
Volume Right	0	100	0	0	308
cSH	1700	1700	1108	252	620
Volume to Capacity	0.26	0.06	0.03	0.47	0.50
Queue Length 95th (m)	0.0	0.0	0.6	18.6	22.1
Control Delay (s)	0.0	0.0	0.7	31.3	16.4
Lane LOS			A	D	C
Approach Delay (s)	0.0		0.7	20.5	
Approach LOS				C	

Intersection Summary			
Average Delay	6.0		
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		

Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	606	69	47	466	110	29	94	140	65	70	40
Future Volume (vph)	64	606	69	47	466	110	29	94	140	65	70	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	180.0		0.0	185.0		0.0	157.0		0.0	150.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.985			0.971			0.910			0.946	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	1818	0	1733	1751	0	1623	1683	0	1785	1701	0
Flt Permitted	0.275			0.185			0.682			0.596		
Satd. Flow (perm)	512	1818	0	337	1751	0	1165	1683	0	1120	1701	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			27			134			42	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1121.3			305.8			269.5			271.6	
Travel Time (s)		80.7			22.0			19.4			19.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	2%	0%	3%	4%	5%	10%	4%	0%	0%	7%	0%
Adj. Flow (vph)	67	638	73	49	491	116	31	99	147	68	74	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	711	0	49	607	0	31	246	0	68	116	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	24.0	24.0		24.0	24.0		26.0	26.0		26.0	26.0	
Total Split (s)	34.0	34.0		34.0	34.0		26.0	26.0		26.0	26.0	
Total Split (%)	56.7%	56.7%		56.7%	56.7%		43.3%	43.3%		43.3%	43.3%	
Maximum Green (s)	28.0	28.0		28.0	28.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	13.0	13.0		13.0	13.0		15.0	15.0		15.0	15.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	28.0	28.0		28.0	28.0		20.0	20.0		20.0	20.0	
Actuated g/C Ratio	0.47	0.47		0.47	0.47		0.33	0.33		0.33	0.33	

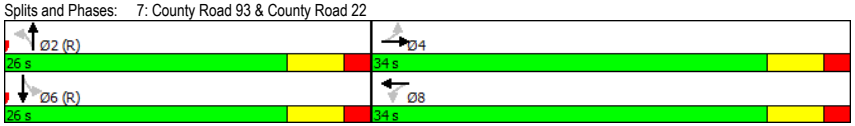
Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.28	0.83		0.31	0.73		0.08	0.38		0.18	0.19	
Control Delay	13.8	24.8		16.8	18.9		14.5	9.2		15.8	10.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	13.8	24.8		16.8	18.9		14.5	9.2		15.8	10.8	
LOS	B	C		B	B		B	A		B	B	
Approach Delay		23.8			18.7			9.8			12.7	
Approach LOS		C			B			A			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 18.9		Intersection LOS: B	
Intersection Capacity Utilization 101.5%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 7: County Road 93 & County Road 22



Queues
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	67	711	49	607	31	246	68	116
v/c Ratio	0.28	0.83	0.31	0.73	0.08	0.38	0.18	0.19
Control Delay	13.8	24.8	16.8	18.9	14.5	9.2	15.8	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.8	24.8	16.8	18.9	14.5	9.2	15.8	10.8
Queue Length 50th (m)	4.5	66.0	3.3	50.9	2.4	9.1	5.5	5.9
Queue Length 95th (m)	12.7	#129.0	11.4	87.4	7.6	24.2	13.7	15.8
Internal Link Dist (m)		1097.3		281.8		245.5		247.6
Turn Bay Length (m)	180.0		185.0		157.0		150.0	
Base Capacity (vph)	238	855	157	831	388	650	373	595
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.83	0.31	0.73	0.08	0.38	0.18	0.19

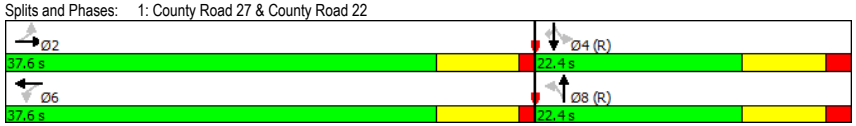
Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	234	17	93	379	139	23	353	95	84	306	40
Future Volume (vph)	40	234	17	93	379	139	23	353	95	84	306	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	110.0		0.0	0.0		0.0	130.0		0.0	125.0		110.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			0.0			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.990			0.969			0.968				0.850
Flt Protected	0.950				0.992		0.950			0.950		
Satd. Flow (prot)	1767	1762	0	0	1711	0	1700	3456	0	1668	1842	1597
Flt Permitted	0.403				0.898		0.485			0.482		
Satd. Flow (perm)	750	1762	0	0	1549	0	868	3456	0	846	1842	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			36			54				75
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		515.9			1538.1			209.3			305.4	
Travel Time (s)		23.2			69.2			9.4			13.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	5%	13%	8%	7%	0%	5%	0%	0%	7%	2%	0%
Adj. Flow (vph)	42	246	18	98	399	146	24	372	100	88	322	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	264	0	0	643	0	24	472	0	88	322	42
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		4
Minimum Split (s)	27.8	27.8		27.8	27.8		17.8	17.8		17.8	17.8	17.8
Total Split (s)	37.6	37.6		37.6	37.6		22.4	22.4		22.4	22.4	22.4
Total Split (%)	62.7%	62.7%		62.7%	62.7%		37.3%	37.3%		37.3%	37.3%	37.3%
Maximum Green (s)	30.5	30.5		30.5	30.5		14.6	14.6		14.6	14.6	14.6
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.2	1.2		1.2	1.2		1.9	1.9		1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1			7.1		7.8	7.8		7.8	7.8	7.8
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)	30.5	30.5			30.5		14.6	14.6		14.6	14.6	14.6
Actuated g/C Ratio	0.51	0.51			0.51		0.24	0.24		0.24	0.24	0.24
v/c Ratio	0.11	0.29			0.80		0.11	0.54		0.43	0.72	0.09
Control Delay	8.7	9.3			21.4		19.4	20.0		26.9	32.0	2.8
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	8.7	9.3			21.4		19.4	20.0		26.9	32.0	2.8
LOS	A	A			C		B	B		C	C	A
Approach Delay		9.2			21.4			20.0			28.3	
Approach LOS		A			C			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 20.7		Intersection LOS: C	
Intersection Capacity Utilization 99.5%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: County Road 27 & County Road 22



Queues
1: County Road 27 & County Road 22

11/16/2016

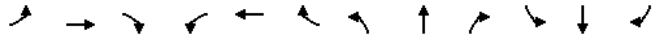
Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	42	264	643	24	472	88	322	42
v/c Ratio	0.11	0.29	0.80	0.11	0.54	0.43	0.72	0.09
Control Delay	8.7	9.3	21.4	19.4	20.0	26.9	32.0	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.7	9.3	21.4	19.4	20.0	26.9	32.0	2.8
Queue Length 50th (m)	2.3	15.6	53.5	2.2	21.9	8.6	34.2	0.0
Queue Length 95th (m)	7.0	28.4	#114.4	7.4	35.1	21.0	#67.7	3.4
Internal Link Dist (m)		491.9	1514.1		185.3		281.4	
Turn Bay Length (m)	110.0			130.0		125.0		110.0
Base Capacity (vph)	381	900	805	211	881	205	448	445
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.29	0.80	0.11	0.54	0.43	0.72	0.09

Intersection Summary

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

Lanes, Volumes, Timings
2: Gill Road & County Road 22

11/16/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	413	8	11	589	16	7	2	10	13	3	3
Future Volume (vph)	10	413	8	11	589	16	7	2	10	13	3	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.9	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.996			0.926			0.980	
Flt Protected		0.999			0.999			0.983			0.966	
Satd. Flow (prot)	0	1819	0	0	1784	0	0	1595	0	0	1707	0
Flt Permitted		0.999			0.999			0.983			0.966	
Satd. Flow (perm)	0	1819	0	0	1784	0	0	1595	0	0	1707	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		1538.1			370.7			296.2			94.4	
Travel Time (s)		69.2			16.7			17.8			6.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	5%	0%	5%	0%	0%	0%	0%	6%	0%	0%
Adj. Flow (vph)	11	435	8	12	620	17	7	2	11	14	3	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	454	0	0	649	0	0	20	0	0	20	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.11	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 47.2% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
2: Gill Road & County Road 22

11/16/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	413	8	11	589	16	7	2	10	13	3	3
Future Volume (Veh/h)	10	413	8	11	589	16	7	2	10	13	3	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	435	8	12	620	17	7	2	11	14	3	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	637			443			1118	1122	439	1126	1118	628
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	637			443			1118	1122	439	1126	1118	628
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	99			99			96	99	98	92	99	99
cM capacity (veh/h)	956			1128			180	203	622	171	204	486

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	454	649	20	20
Volume Left	11	12	7	14
Volume Right	8	17	11	3
cSH	956	1128	301	195
Volume to Capacity	0.01	0.01	0.07	0.10
Queue Length 95th (m)	0.3	0.3	1.7	2.7
Control Delay (s)	0.3	0.3	17.8	25.5
Lane LOS	A	A	C	D
Approach Delay (s)	0.3	0.3	17.8	25.5
Approach LOS			C	D

Intersection Summary					
Average Delay			1.1		
Intersection Capacity Utilization			47.2%	ICU Level of Service	A
Analysis Period (min)			15		

Lanes, Volumes, Timings
3: Fox Farm Road & County Road 22/Country Road 22

11/16/2016

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	421	6	8	604	7	9
Future Volume (vph)	421	6	8	604	7	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.998				0.924	
Flt Protected				0.999	0.979	
Satd. Flow (prot)	1821	0	0	1803	1700	0
Flt Permitted				0.999	0.979	
Satd. Flow (perm)	1821	0	0	1803	1700	0
Link Speed (k/h)	80			50	80	
Link Distance (m)	153.6			1063.4	320.8	
Travel Time (s)	6.9			76.6	14.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	0%	12%	4%	0%	0%
Adj. Flow (vph)	443	6	8	636	7	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	449	0	0	644	16	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	48.2%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Fox Farm Road & County Road 22/Country Road 22

11/16/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	421	6	8	604	7	9
Future Volume (Veh/h)	421	6	8	604	7	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	443	6	8	636	7	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			449		1098	446
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			449		1098	446
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			99		97	99
cM capacity (veh/h)			1060		236	617

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	449	644	16
Volume Left	0	8	7
Volume Right	6	0	9
cSH	1700	1060	361
Volume to Capacity	0.26	0.01	0.04
Queue Length 95th (m)	0.0	0.2	1.1
Control Delay (s)	0.0	0.2	15.4
Lane LOS		A	C
Approach Delay (s)	0.0	0.2	15.4
Approach LOS			C

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		48.2%	ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings
4: Old Second Road

11/16/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	424	7	5	610	14	6	8	8	7	5	3
Future Volume (vph)	3	424	7	5	610	14	6	8	8	7	5	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.997			0.951			0.973	
Flt Protected								0.987			0.977	
Satd. Flow (prot)	0	1784	0	0	1801	0	0	1677	0	0	1634	0
Flt Permitted								0.987			0.977	
Satd. Flow (perm)	0	1784	0	0	1801	0	0	1677	0	0	1634	0
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		1063.4			661.0			398.3			389.2	
Travel Time (s)		76.6			47.6			17.9			17.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	5%	16%	16%	4%	0%	7%	0%	9%	20%	0%	0%
Adj. Flow (vph)	3	446	7	5	642	15	6	8	8	7	5	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	456	0	0	662	0	0	22	0	0	15	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	46.3%	ICU Level of Service A	
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
4: Old Second Road

11/16/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	424	7	5	610	14	6	8	8	7	5	3
Future Volume (Veh/h)	3	424	7	5	610	14	6	8	8	7	5	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	3	446	7	5	642	15	6	8	8	7	5	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	657			453			1120	1122	450	1127	1118	650
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	657			453			1120	1122	450	1127	1118	650
tC, single (s)	4.1			4.3			7.2	6.5	6.3	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.4	3.7	4.0	3.3
p0 queue free %	100			100			97	96	99	96	98	99
cM capacity (veh/h)	940			1038			174	206	595	160	207	473

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	456	662	22	15
Volume Left	3	5	6	7
Volume Right	7	15	8	3
cSH	940	1038	254	202
Volume to Capacity	0.00	0.00	0.09	0.07
Queue Length 95th (m)	0.1	0.1	2.3	1.9
Control Delay (s)	0.1	0.1	20.5	24.3
Lane LOS	A	A	C	C
Approach Delay (s)	0.1	0.1	20.5	24.3
Approach LOS			C	C

Intersection Summary				
Average Delay			0.8	
Intersection Capacity Utilization			46.3%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
5: Country Road 22 & Highway 400 South Ramp

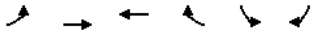
11/16/2016

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	108	329	529	242	6	102
Future Volume (vph)	108	329	529	242	6	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.872	
Flt Protected		0.988			0.997	
Satd. Flow (prot)	0	1772	1824	1581	1597	0
Flt Permitted		0.988			0.997	
Satd. Flow (perm)	0	1772	1824	1581	1597	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		661.0	382.0		499.1	
Travel Time (s)		47.6	27.5		35.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	4%	3%	1%	25%	1%
Adj. Flow (vph)	114	346	557	255	6	107
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	460	557	255	113	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: Country Road 22 & Highway 400 South Ramp

11/16/2016



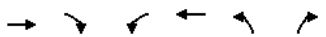
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	108	329	529	242	6	102
Future Volume (Veh/h)	108	329	529	242	6	102
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	114	346	557	255	6	107
Pedestrians						
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	557				1131	557
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	557				1131	557
tC, single (s)	4.2				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.7	3.3
p0 queue free %	88				97	80
cM capacity (veh/h)	989				180	532

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	460	557	255	113
Volume Left	114	0	0	6
Volume Right	0	0	255	107
cSH	989	1700	1700	482
Volume to Capacity	0.12	0.33	0.15	0.23
Queue Length 95th (m)	3.1	0.0	0.0	7.2
Control Delay (s)	3.3	0.0	0.0	14.8
Lane LOS	A			B
Approach Delay (s)	3.3	0.0		14.8
Approach LOS				B

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		

Lanes, Volumes, Timings
6: Highway 400 North Ramp & County Road 22

11/16/2016



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	276	57	21	732	52	145
Future Volume (vph)	276	57	21	732	52	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.999	0.950	
Satd. Flow (prot)	1824	1581	0	1804	1785	1566
Flt Permitted				0.999	0.950	
Satd. Flow (perm)	1824	1581	0	1804	1785	1566
Link Speed (k/h)	50			80	50	
Link Distance (m)	382.0			36.2	392.3	
Travel Time (s)	27.5			1.6	28.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	1%	5%	4%	0%	2%
Adj. Flow (vph)	291	60	22	771	55	153
Shared Lane Traffic (%)						
Lane Group Flow (vph)	291	60	0	793	55	153
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	65.4%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6: Highway 400 North Ramp & County Road 22

11/16/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	276	57	21	732	52	145
Future Volume (Veh/h)	276	57	21	732	52	145
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	291	60	22	771	55	153
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			291		1106	291
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			291		1106	291
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		76	80
cM capacity (veh/h)			1254		231	748

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2
Volume Total	291	60	793	55	153
Volume Left	0	0	22	55	0
Volume Right	0	60	0	0	153
cSH	1700	1700	1254	231	748
Volume to Capacity	0.17	0.04	0.02	0.24	0.20
Queue Length 95th (m)	0.0	0.0	0.4	7.2	6.1
Control Delay (s)	0.0	0.0	0.5	25.4	11.0
Lane LOS			A	D	B
Approach Delay (s)	0.0		0.5	14.8	
Approach LOS				B	

Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	65.4%	ICU Level of Service		C
Analysis Period (min)	15			

Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/16/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	376	44	56	681	85	70	62	33	51	43	22
Future Volume (vph)	27	376	44	56	681	85	70	62	33	51	43	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	180.0		0.0	185.0		0.0	157.0		0.0	150.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.984			0.983			0.947			0.949	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	1816	0	1733	1774	0	1623	1734	0	1785	1704	0
Flt Permitted	0.143			0.427			0.713			0.692		
Satd. Flow (perm)	266	1816	0	779	1774	0	1218	1734	0	1300	1704	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			14			35			23	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1121.3			305.8			269.5			271.6	
Travel Time (s)		80.7			22.0			19.4			19.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	2%	0%	3%	4%	5%	10%	4%	0%	0%	7%	0%
Adj. Flow (vph)	28	396	46	59	717	89	74	65	35	54	45	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	442	0	59	806	0	74	100	0	54	68	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	24.0	24.0		24.0	24.0		26.0	26.0		26.0	26.0	
Total Split (s)	34.0	34.0		34.0	34.0		26.0	26.0		26.0	26.0	
Total Split (%)	56.7%	56.7%		56.7%	56.7%		43.3%	43.3%		43.3%	43.3%	
Maximum Green (s)	28.0	28.0		28.0	28.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	13.0	13.0		13.0	13.0		15.0	15.0		15.0	15.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	28.0	28.0		28.0	28.0		20.0	20.0		20.0	20.0	
Actuated g/C Ratio	0.47	0.47		0.47	0.47		0.33	0.33		0.33	0.33	

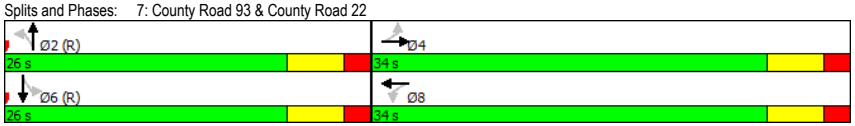
Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/16/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.23	0.52		0.16	0.97		0.18	0.17		0.12	0.12	
Control Delay	15.3	13.6		10.7	42.2		15.7	10.9		14.9	10.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	15.3	13.6		10.7	42.2		15.7	10.9		14.9	10.8	
LOS	B	B		B	D		B	B		B	B	
Approach Delay		13.7			40.1			12.9			12.7	
Approach LOS		B			D			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 27.5		Intersection LOS: C	
Intersection Capacity Utilization 73.2%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 7: County Road 93 & County Road 22



Queues
7: County Road 93 & County Road 22

11/16/2016

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	28	442	59	806	74	100	54	68
v/c Ratio	0.23	0.52	0.16	0.97	0.18	0.17	0.12	0.12
Control Delay	15.3	13.6	10.7	42.2	15.7	10.9	14.9	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.3	13.6	10.7	42.2	15.7	10.9	14.9	10.8
Queue Length 50th (m)	1.8	32.5	3.7	83.5	6.0	5.1	4.3	3.5
Queue Length 95th (m)	7.4	55.7	10.0	#158.7	14.6	14.2	11.2	10.9
Internal Link Dist (m)		1097.3		281.8		245.5		247.6
Turn Bay Length (m)	180.0		185.0		157.0		150.0	
Base Capacity (vph)	124	854	363	835	406	601	433	583
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.52	0.16	0.97	0.18	0.17	0.12	0.12

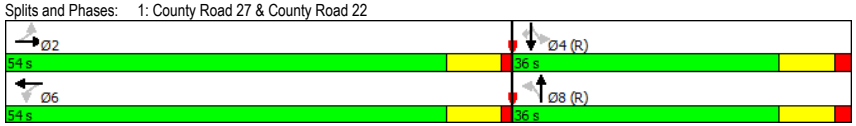
Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	593	16	66	370	137	27	520	195	124	266	66
Future Volume (vph)	57	593	16	66	370	137	27	520	195	124	266	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	110.0		0.0	0.0		0.0	130.0		0.0	125.0		110.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			0.0			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.996			0.968			0.959				0.850
Flt Protected	0.950				0.994		0.950			0.950		
Satd. Flow (prot)	1767	1779	0	0	1715	0	1700	3424	0	1668	1842	1597
Flt Permitted	0.391				0.688		0.513			0.241		
Satd. Flow (perm)	727	1779	0	0	1187	0	918	3424	0	423	1842	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			26			63				69
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		515.9			1538.1			209.3			305.4	
Travel Time (s)		23.2			69.2			9.4			13.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	5%	13%	8%	7%	0%	5%	0%	0%	7%	2%	0%
Adj. Flow (vph)	60	624	17	69	389	144	28	547	205	131	280	69
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	641	0	0	602	0	28	752	0	131	280	69
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		4
Minimum Split (s)	27.8	27.8		27.8	27.8		17.8	17.8		17.8	17.8	17.8
Total Split (s)	54.0	54.0		54.0	54.0		36.0	36.0		36.0	36.0	36.0
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	40.0%
Maximum Green (s)	46.9	46.9		46.9	46.9		28.2	28.2		28.2	28.2	28.2
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.2	1.2		1.2	1.2		1.9	1.9		1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1			7.1		7.8	7.8		7.8	7.8	7.8
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)	46.9	46.9			46.9		28.2	28.2		28.2	28.2	28.2
Actuated g/C Ratio	0.52	0.52			0.52		0.31	0.31		0.31	0.31	0.31
v/c Ratio	0.16	0.69			0.95		0.10	0.67		0.99	0.49	0.13
Control Delay	12.7	21.0			48.0		23.1	28.1		112.0	28.5	6.5
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	12.7	21.0			48.0		23.1	28.1		112.0	28.5	6.5
LOS	B	C			D		C	C		F	C	A
Approach Delay		20.2			48.0			27.9			48.1	
Approach LOS		C			D			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green			
Natural Cycle: 50			
Control Type: Pretimed			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 34.3		Intersection LOS: C	
Intersection Capacity Utilization 117.4%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 1: County Road 27 & County Road 22



Queues
1: County Road 27 & County Road 22

11/15/2016

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	60	641	602	28	752	131	280	69
v/c Ratio	0.16	0.69	0.95	0.10	0.67	0.99	0.49	0.13
Control Delay	12.7	21.0	48.0	23.1	28.1	112.0	28.5	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.7	21.0	48.0	23.1	28.1	112.0	28.5	6.5
Queue Length 50th (m)	5.4	82.5	95.8	3.6	57.0	23.6	40.9	0.0
Queue Length 95th (m)	12.7	123.5	#172.9	10.1	77.4	#60.7	65.2	9.2
Internal Link Dist (m)		491.9	1514.1		185.3		281.4	
Turn Bay Length (m)	110.0			130.0		125.0		110.0
Base Capacity (vph)	378	928	631	287	1116	132	577	547
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.69	0.95	0.10	0.67	0.99	0.49	0.13

Intersection Summary

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

Lanes, Volumes, Timings
2: Gill Road & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	933	10	13	617	17	3	2	2	18	1	18
Future Volume (vph)	21	933	10	13	617	17	3	2	2	18	1	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.9	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.996			0.961			0.934	
Flt Protected		0.999			0.999			0.979			0.976	
Satd. Flow (prot)	0	1821	0	0	1784	0	0	1649	0	0	1664	0
Flt Permitted		0.999			0.999			0.979			0.976	
Satd. Flow (perm)	0	1821	0	0	1784	0	0	1649	0	0	1664	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		1538.1			370.7			296.2			94.4	
Travel Time (s)		69.2			16.7			17.8			6.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	5%	0%	5%	0%	0%	0%	0%	6%	0%	0%
Adj. Flow (vph)	22	982	11	14	649	18	3	2	2	19	1	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1015	0	0	681	0	0	7	0	0	39	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.11	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 70.3% ICU Level of Service C
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
2: Gill Road & County Road 22

11/15/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	933	10	13	617	17	3	2	2	18	1	18
Future Volume (Veh/h)	21	933	10	13	617	17	3	2	2	18	1	18
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	22	982	11	14	649	18	3	2	2	19	1	19
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	667			993			1737	1726	988	1720	1723	658
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	667			993			1737	1726	988	1720	1723	658
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	98			98			95	98	99	71	99	96
cM capacity (veh/h)	932			704			64	86	303	65	86	468

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	1015	681	7	39
Volume Left	22	14	3	19
Volume Right	11	18	2	19
cSH	932	704	91	113
Volume to Capacity	0.02	0.02	0.08	0.35
Queue Length 95th (m)	0.6	0.5	2.0	11.0
Control Delay (s)	0.7	0.5	47.9	52.8
Lane LOS	A	A	E	F
Approach Delay (s)	0.7	0.5	47.9	52.8
Approach LOS			E	F

Intersection Summary					
Average Delay			2.0		
Intersection Capacity Utilization			70.3%	ICU Level of Service	C
Analysis Period (min)			15		

Lanes, Volumes, Timings
3: Fox Farm Road & County Road 22/Country Road 22

11/15/2016

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	995	8	11	644	5	10
Future Volume (vph)	995	8	11	644	5	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999				0.907	
Flt Protected				0.999	0.985	
Satd. Flow (prot)	1823	0	0	1802	1679	0
Flt Permitted				0.999	0.985	
Satd. Flow (perm)	1823	0	0	1802	1679	0
Link Speed (k/h)	80			50	80	
Link Distance (m)	153.6			1063.4	320.8	
Travel Time (s)	6.9			76.6	14.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	0%	12%	4%	0%	0%
Adj. Flow (vph)	1047	8	12	678	5	11
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1055	0	0	690	16	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 62.9%		ICU Level of Service B	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
3: Fox Farm Road & County Road 22/Country Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	995	8	11	644	5	10
Future Volume (Veh/h)	995	8	11	644	5	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1047	8	12	678	5	11
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			1055		1753	1051
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1055		1753	1051
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			98		95	96
cM capacity (veh/h)			623		93	278

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1055	690	16
Volume Left	0	12	5
Volume Right	8	0	11
cSH	1700	623	172
Volume to Capacity	0.62	0.02	0.09
Queue Length 95th (m)	0.0	0.5	2.4
Control Delay (s)	0.0	0.5	28.1
Lane LOS		A	D
Approach Delay (s)	0.0	0.5	28.1
Approach LOS			D

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		

Lanes, Volumes, Timings
4: Old Second Road

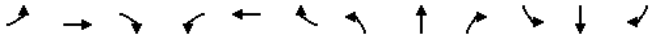
11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	995	8	7	635	23	5	16	9	14	5	6
Future Volume (vph)	4	995	8	7	635	23	5	16	9	14	5	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.995			0.961			0.969	
Flt Protected					0.999			0.992			0.972	
Satd. Flow (prot)	0	1787	0	0	1796	0	0	1727	0	0	1587	0
Flt Permitted					0.999			0.992			0.972	
Satd. Flow (perm)	0	1787	0	0	1796	0	0	1727	0	0	1587	0
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		1063.4			661.0			398.3			389.2	
Travel Time (s)		76.6			47.6			17.9			17.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	5%	16%	16%	4%	0%	7%	0%	9%	20%	0%	0%
Adj. Flow (vph)	4	1047	8	7	668	24	5	17	9	15	5	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1059	0	0	699	0	0	31	0	0	26	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	65.6%	ICU Level of Service C	
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
4: Old Second Road

11/15/2016



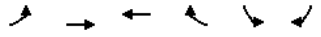
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	995	8	7	635	23	5	16	9	14	5	6
Future Volume (Veh/h)	4	995	8	7	635	23	5	16	9	14	5	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	1047	8	7	668	24	5	17	9	15	5	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	692			1055			1762	1765	1051	1770	1757	680
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	692			1055			1762	1765	1051	1770	1757	680
tC, single (s)	4.1			4.3			7.2	6.5	6.3	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.4	3.7	4.0	3.3
p0 queue free %	100			99			92	80	97	68	94	99
cM capacity (veh/h)	912			609			60	83	267	47	84	454

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	1059	699	31	26
Volume Left	4	7	5	15
Volume Right	8	24	9	6
cSH	912	609	96	66
Volume to Capacity	0.00	0.01	0.32	0.39
Queue Length 95th (m)	0.1	0.3	9.9	11.9
Control Delay (s)	0.1	0.3	59.1	90.4
Lane LOS	A	A	F	F
Approach Delay (s)	0.1	0.3	59.1	90.4
Approach LOS			F	F

Intersection Summary				
Average Delay			2.5	
Intersection Capacity Utilization			65.6%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
5: Country Road 22 & Highway 400 South Ramp

11/15/2016

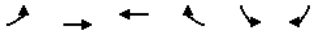


Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	161	842	561	143	13	99
Future Volume (vph)	161	842	561	143	13	99
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.881	
Flt Protected		0.992			0.994	
Satd. Flow (prot)	0	1784	1824	1581	1584	0
Flt Permitted		0.992			0.994	
Satd. Flow (perm)	0	1784	1824	1581	1584	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		661.0	382.0		499.1	
Travel Time (s)		47.6	27.5		35.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	4%	3%	1%	25%	1%
Adj. Flow (vph)	169	886	591	151	14	104
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1055	591	151	118	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	99.6%	ICU Level of Service	F
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: Country Road 22 & Highway 400 South Ramp

11/15/2016



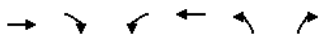
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	161	842	561	143	13	99
Future Volume (Veh/h)	161	842	561	143	13	99
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	169	886	591	151	14	104
Pedestrians						
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	591				1815	591
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	591				1815	591
tC, single (s)	4.2				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.7	3.3
p0 queue free %	82				77	80
cM capacity (veh/h)	960				62	509

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	1055	591	151	118
Volume Left	169	0	0	14
Volume Right	0	0	151	104
cSH	960	1700	1700	274
Volume to Capacity	0.18	0.35	0.09	0.43
Queue Length 95th (m)	5.1	0.0	0.0	16.4
Control Delay (s)	4.5	0.0	0.0	27.8
Lane LOS	A			D
Approach Delay (s)	4.5	0.0		27.8
Approach LOS				D

Intersection Summary			
Average Delay	4.2		
Intersection Capacity Utilization	99.6%	ICU Level of Service	F
Analysis Period (min)	15		

Lanes, Volumes, Timings
6: Highway 400 North Ramp & County Road 22

11/15/2016



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	595	241	35	594	90	329
Future Volume (vph)	595	241	35	594	90	329
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.997	0.950	
Satd. Flow (prot)	1824	1581	0	1800	1785	1566
Flt Permitted				0.997	0.950	
Satd. Flow (perm)	1824	1581	0	1800	1785	1566
Link Speed (k/h)	50			80	50	
Link Distance (m)	382.0			36.2	392.3	
Travel Time (s)	27.5			1.6	28.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	1%	5%	4%	0%	2%
Adj. Flow (vph)	626	254	37	625	95	346
Shared Lane Traffic (%)						
Lane Group Flow (vph)	626	254	0	662	95	346
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6: Highway 400 North Ramp & County Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	595	241	35	594	90	329
Future Volume (Veh/h)	595	241	35	594	90	329
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	626	254	37	625	95	346
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			626		1325	626
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			626		1325	626
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		43	29
cM capacity (veh/h)			941		167	484

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2
Volume Total	626	254	662	95	346
Volume Left	0	0	37	95	0
Volume Right	0	254	0	0	346
cSH	1700	1700	941	167	484
Volume to Capacity	0.37	0.15	0.04	0.57	0.71
Queue Length 95th (m)	0.0	0.0	1.0	23.9	45.3
Control Delay (s)	0.0	0.0	1.0	51.9	28.9
Lane LOS			A	F	D
Approach Delay (s)	0.0		1.0	33.9	
Approach LOS				D	

Intersection Summary				
Average Delay	7.9			
Intersection Capacity Utilization	71.5%	ICU Level of Service		C
Analysis Period (min)	15			

Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	829	68	50	576	108	69	113	134	86	55	29
Future Volume (vph)	53	829	68	50	576	108	69	113	134	86	55	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	180.0		0.0	185.0		0.0	157.0		0.0	150.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.989			0.976			0.919			0.948	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	1825	0	1733	1761	0	1623	1696	0	1785	1703	0
Flt Permitted	0.252			0.101			0.699			0.500		
Satd. Flow (perm)	469	1825	0	184	1761	0	1194	1696	0	939	1703	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			21			78			31	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1121.3			305.8			269.5			271.6	
Travel Time (s)		80.7			22.0			19.4			19.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	2%	0%	3%	4%	5%	10%	4%	0%	0%	7%	0%
Adj. Flow (vph)	56	873	72	53	606	114	73	119	141	91	58	31
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	945	0	53	720	0	73	260	0	91	89	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	24.0	24.0		24.0	24.0		26.0	26.0		26.0	26.0	
Total Split (s)	49.0	49.0		49.0	49.0		26.0	26.0		26.0	26.0	
Total Split (%)	65.3%	65.3%		65.3%	65.3%		34.7%	34.7%		34.7%	34.7%	
Maximum Green (s)	43.0	43.0		43.0	43.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	13.0	13.0		13.0	13.0		15.0	15.0		15.0	15.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	43.0	43.0		43.0	43.0		20.0	20.0		20.0	20.0	
Actuated g/C Ratio	0.57	0.57		0.57	0.57		0.27	0.27		0.27	0.27	

Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.21	0.90		0.50	0.71		0.23	0.51		0.36	0.19	
Control Delay	10.2	27.9		31.1	15.9		23.9	20.2		27.5	16.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	10.2	27.9		31.1	15.9		23.9	20.2		27.5	16.1	
LOS	B	C		C	B		C	C		C	B	
Approach Delay		26.9			17.0			21.0			21.9	
Approach LOS		C			B			C			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 75			
Actuated Cycle Length: 75			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 75			
Control Type: Pretimed			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 22.3		Intersection LOS: C	
Intersection Capacity Utilization 96.1%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 7: County Road 93 & County Road 22

Queues
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	56	945	53	720	73	260	91	89
v/c Ratio	0.21	0.90	0.50	0.71	0.23	0.51	0.36	0.19
Control Delay	10.2	27.9	31.1	15.9	23.9	20.2	27.5	16.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.2	27.9	31.1	15.9	23.9	20.2	27.5	16.1
Queue Length 50th (m)	3.7	112.0	4.3	67.9	8.5	22.2	11.0	6.6
Queue Length 95th (m)	10.1	#202.8	#21.9	109.2	19.1	44.6	24.3	17.4
Internal Link Dist (m)		1097.3		281.8		245.5		247.6
Turn Bay Length (m)	180.0		185.0		157.0		150.0	
Base Capacity (vph)	268	1050	105	1018	318	509	250	476
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.90	0.50	0.71	0.23	0.51	0.36	0.19

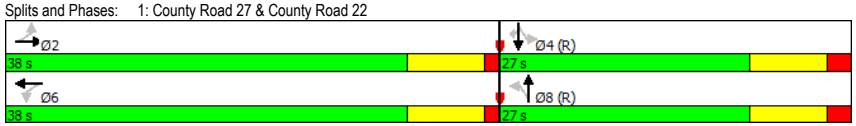
Intersection Summary
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	444	23	78	359	150	17	447	184	125	344	33
Future Volume (vph)	56	444	23	78	359	150	17	447	184	125	344	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	110.0		0.0	0.0		0.0	130.0		0.0	125.0		110.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			0.0			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.993			0.965			0.956				0.850
Flt Protected	0.950				0.993		0.950			0.950		
Satd. Flow (prot)	1767	1770	0	0	1709	0	1700	3413	0	1668	1842	1597
Flt Permitted	0.392				0.800		0.439			0.331		
Satd. Flow (perm)	729	1770	0	0	1377	0	786	3413	0	581	1842	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			36			98				69
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		515.9			1538.1			209.3			305.4	
Travel Time (s)		23.2			69.2			9.4			13.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	5%	13%	8%	7%	0%	5%	0%	0%	7%	2%	0%
Adj. Flow (vph)	59	467	24	82	378	158	18	471	194	132	362	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	59	491	0	0	618	0	18	665	0	132	362	35
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		4
Minimum Split (s)	27.8	27.8		27.8	27.8		17.8	17.8		17.8	17.8	17.8
Total Split (s)	38.0	38.0		38.0	38.0		27.0	27.0		27.0	27.0	27.0
Total Split (%)	58.5%	58.5%		58.5%	58.5%		41.5%	41.5%		41.5%	41.5%	41.5%
Maximum Green (s)	30.9	30.9		30.9	30.9		19.2	19.2		19.2	19.2	19.2
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.2	1.2		1.2	1.2		1.9	1.9		1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1			7.1		7.8	7.8		7.8	7.8	7.8
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)	30.9	30.9			30.9		19.2	19.2		19.2	19.2	19.2
Actuated g/C Ratio	0.48	0.48			0.48		0.30	0.30		0.30	0.30	0.30
v/c Ratio	0.17	0.58			0.92		0.08	0.62		0.77	0.67	0.07
Control Delay	11.4	15.7			37.5		17.7	19.6		54.1	27.1	2.1
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	11.4	15.7			37.5		17.7	19.6		54.1	27.1	2.1
LOS	B	B			D		B	B		D	C	A
Approach Delay		15.2			37.5			19.5			32.2	
Approach LOS		B			D			B			C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 65			
Actuated Cycle Length: 65			
Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green			
Natural Cycle: 65			
Control Type: Pretimed			
Maximum v/c Ratio: 0.92			
Intersection Signal Delay: 26.0		Intersection LOS: C	
Intersection Capacity Utilization 108.5%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 1: County Road 27 & County Road 22



Queues
1: County Road 27 & County Road 22

11/15/2016

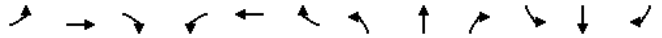
Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	59	491	618	18	665	132	362	35
v/c Ratio	0.17	0.58	0.92	0.08	0.62	0.77	0.67	0.07
Control Delay	11.4	15.7	37.5	17.7	19.6	54.1	27.1	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.4	15.7	37.5	17.7	19.6	54.1	27.1	2.1
Queue Length 50th (m)	4.0	41.9	65.2	1.6	32.0	15.1	39.9	0.0
Queue Length 95th (m)	10.6	69.4	#132.5	6.1	48.4	#43.5	66.9	2.4
Internal Link Dist (m)		491.9	1514.1		185.3		281.4	
Turn Bay Length (m)	110.0			130.0		125.0		110.0
Base Capacity (vph)	346	844	673	232	1077	171	544	520
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.58	0.92	0.08	0.62	0.77	0.67	0.07

Intersection Summary

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

Lanes, Volumes, Timings
2: Gill Road & County Road 22

11/15/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	750	18	17	579	10	11	3	9	15	0	12
Future Volume (vph)	13	750	18	17	579	10	11	3	9	15	0	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.9	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.998			0.949			0.939	
Flt Protected		0.999			0.999			0.976			0.973	
Satd. Flow (prot)	0	1817	0	0	1788	0	0	1623	0	0	1662	0
Flt Permitted		0.999			0.999			0.976			0.973	
Satd. Flow (perm)	0	1817	0	0	1788	0	0	1623	0	0	1662	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		1538.1			370.7			296.2			94.4	
Travel Time (s)		69.2			16.7			17.8			6.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	5%	0%	5%	0%	0%	0%	0%	6%	0%	0%
Adj. Flow (vph)	14	789	19	18	609	11	12	3	9	16	0	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	822	0	0	638	0	0	24	0	0	29	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.11	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	56.3%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
2: Gill Road & County Road 22

11/15/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	750	18	17	579	10	11	3	9	15	0	12
Future Volume (Veh/h)	13	750	18	17	579	10	11	3	9	15	0	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	14	789	19	18	609	11	12	3	9	16	0	13
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	620			808			1490	1482	798	1488	1486	614
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	620			808			1490	1482	798	1488	1486	614
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	99			98			88	98	98	83	100	97
cM capacity (veh/h)	970			826			98	122	389	94	121	495

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	822	638	24	29
Volume Left	14	18	12	16
Volume Right	19	11	9	13
cSH	970	826	141	147
Volume to Capacity	0.01	0.02	0.17	0.20
Queue Length 95th (m)	0.4	0.5	4.7	5.6
Control Delay (s)	0.4	0.6	35.8	35.4
Lane LOS	A	A	E	E
Approach Delay (s)	0.4	0.6	35.8	35.4
Approach LOS			E	E

Intersection Summary					
Average Delay			1.7		
Intersection Capacity Utilization			56.3%	ICU Level of Service	B
Analysis Period (min)			15		

Lanes, Volumes, Timings
3: Fox Farm Road & County Road 22/Country Road 22

11/15/2016

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	797	11	13	597	3	6
Future Volume (vph)	797	11	13	597	3	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.998				0.910	
Flt Protected				0.999	0.984	
Satd. Flow (prot)	1821	0	0	1802	1682	0
Flt Permitted				0.999	0.984	
Satd. Flow (perm)	1821	0	0	1802	1682	0
Link Speed (k/h)	80			50	80	
Link Distance (m)	153.6			1063.4	320.8	
Travel Time (s)	6.9			76.6	14.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	0%	12%	4%	0%	0%
Adj. Flow (vph)	839	12	14	628	3	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	851	0	0	642	9	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary				
Area Type:	Other			
Control Type: Unsignalized				
Intersection Capacity Utilization	52.6%		ICU Level of Service A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
3: Fox Farm Road & County Road 22/Country Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	797	11	13	597	3	6
Future Volume (Veh/h)	797	11	13	597	3	6
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	839	12	14	628	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			851		1501	845
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			851		1501	845
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			98		98	98
cM capacity (veh/h)			746		133	366

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	851	642	9
Volume Left	0	14	3
Volume Right	12	0	6
cSH	1700	746	231
Volume to Capacity	0.50	0.02	0.04
Queue Length 95th (m)	0.0	0.5	1.0
Control Delay (s)	0.0	0.5	21.2
Lane LOS		A	C
Approach Delay (s)	0.0	0.5	21.2
Approach LOS			C

Intersection Summary			
Average Delay		0.3	
Intersection Capacity Utilization		52.6%	ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings
4: Old Second Road

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	772	12	6	586	48	14	24	11	10	9	5
Future Volume (vph)	13	772	12	6	586	48	14	24	11	10	9	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.990			0.969			0.973	
Flt Protected		0.999						0.986			0.978	
Satd. Flow (prot)	0	1783	0	0	1792	0	0	1725	0	0	1643	0
Flt Permitted		0.999						0.986			0.978	
Satd. Flow (perm)	0	1783	0	0	1792	0	0	1725	0	0	1643	0
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		1063.4			661.0			398.3			389.2	
Travel Time (s)		76.6			47.6			17.9			17.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	5%	16%	16%	4%	0%	7%	0%	9%	20%	0%	0%
Adj. Flow (vph)	14	813	13	6	617	51	15	25	12	11	9	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	840	0	0	674	0	0	52	0	0	25	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 59.5%		ICU Level of Service B	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
4: Old Second Road

11/15/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	772	12	6	586	48	14	24	11	10	9	5
Future Volume (Veh/h)	13	772	12	6	586	48	14	24	11	10	9	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	14	813	13	6	617	51	15	25	12	11	9	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	668			826			1512	1528	820	1526	1508	642
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	668			826			1512	1528	820	1526	1508	642
tC, single (s)	4.1			4.3			7.2	6.5	6.3	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.4	3.7	4.0	3.3
p0 queue free %	98			99			83	78	97	84	92	99
cM capacity (veh/h)	931			747			88	116	365	69	119	477

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	840	674	52	25
Volume Left	14	6	15	11
Volume Right	13	51	12	5
cSH	931	747	124	102
Volume to Capacity	0.02	0.01	0.42	0.24
Queue Length 95th (m)	0.4	0.2	14.4	7.1
Control Delay (s)	0.4	0.2	53.5	51.3
Lane LOS	A	A	F	F
Approach Delay (s)	0.4	0.2	53.5	51.3
Approach LOS			F	F

Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	59.5%	ICU Level of Service	B	
Analysis Period (min)	15			

Lanes, Volumes, Timings
5: Country Road 22 & Highway 400 South Ramp

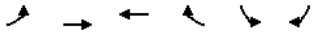
11/15/2016

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	182	608	544	180	9	98
Future Volume (vph)	182	608	544	180	9	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.876	
Flt Protected		0.989			0.996	
Satd. Flow (prot)	0	1775	1824	1581	1593	0
Flt Permitted		0.989			0.996	
Satd. Flow (perm)	0	1775	1824	1581	1593	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		661.0	382.0		499.1	
Travel Time (s)		47.6	27.5		35.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	4%	3%	1%	25%	1%
Adj. Flow (vph)	192	640	573	189	9	103
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	832	573	189	112	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	87.3%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: Country Road 22 & Highway 400 South Ramp

11/15/2016



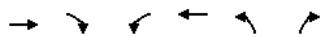
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	182	608	544	180	9	98
Future Volume (Veh/h)	182	608	544	180	9	98
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	192	640	573	189	9	103
Pedestrians						
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	573				1597	573
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	573				1597	573
tC, single (s)	4.2				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.7	3.3
p0 queue free %	80				89	80
cM capacity (veh/h)	976				83	521

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	832	573	189	112
Volume Left	192	0	0	9
Volume Right	0	0	189	103
cSH	976	1700	1700	366
Volume to Capacity	0.20	0.34	0.11	0.31
Queue Length 95th (m)	5.8	0.0	0.0	10.2
Control Delay (s)	4.5	0.0	0.0	19.1
Lane LOS	A			C
Approach Delay (s)	4.5	0.0		19.1
Approach LOS				C

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	87.3%	ICU Level of Service	E
Analysis Period (min)	15		

Lanes, Volumes, Timings
6: Highway 400 North Ramp & County Road 22

11/15/2016



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	513	95	33	604	113	357
Future Volume (vph)	513	95	33	604	113	357
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.997	0.950	
Satd. Flow (prot)	1824	1581	0	1800	1785	1566
Flt Permitted				0.997	0.950	
Satd. Flow (perm)	1824	1581	0	1800	1785	1566
Link Speed (k/h)	50			80	50	
Link Distance (m)	382.0			36.2	392.3	
Travel Time (s)	27.5			1.6	28.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	1%	5%	4%	0%	2%
Adj. Flow (vph)	540	100	35	636	119	376
Shared Lane Traffic (%)						
Lane Group Flow (vph)	540	100	0	671	119	376
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6: Highway 400 North Ramp & County Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	513	95	33	604	113	357
Future Volume (Veh/h)	513	95	33	604	113	357
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	540	100	35	636	119	376
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			540		1246	540
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			540		1246	540
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		36	31
cM capacity (veh/h)			1013		187	542

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2
Volume Total	540	100	671	119	376
Volume Left	0	0	35	119	0
Volume Right	0	100	0	0	376
cSH	1700	1700	1013	187	542
Volume to Capacity	0.32	0.06	0.03	0.64	0.69
Queue Length 95th (m)	0.0	0.0	0.9	29.3	43.2
Control Delay (s)	0.0	0.0	0.9	52.9	25.4
Lane LOS			A	F	D
Approach Delay (s)	0.0		0.9	32.0	
Approach LOS				D	

Intersection Summary			
Average Delay	9.1		
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		

Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	772	69	56	555	127	29	94	176	82	70	40
Future Volume (vph)	64	772	69	56	555	127	29	94	176	82	70	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	180.0		0.0	185.0		0.0	157.0		0.0	150.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988			0.972			0.902			0.946	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	1823	0	1733	1753	0	1623	1671	0	1785	1701	0
Flt Permitted	0.211			0.121			0.682			0.514		
Satd. Flow (perm)	393	1823	0	221	1753	0	1165	1671	0	966	1701	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			26			132			42	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1121.3			305.8			269.5			271.6	
Travel Time (s)		80.7			22.0			19.4			19.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	2%	0%	3%	4%	5%	10%	4%	0%	0%	7%	0%
Adj. Flow (vph)	67	813	73	59	584	134	31	99	185	86	74	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	67	886	0	59	718	0	31	284	0	86	116	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	24.0	24.0		24.0	24.0		26.0	26.0		26.0	26.0	
Total Split (s)	39.0	39.0		39.0	39.0		26.0	26.0		26.0	26.0	
Total Split (%)	60.0%	60.0%		60.0%	60.0%		40.0%	40.0%		40.0%	40.0%	
Maximum Green (s)	33.0	33.0		33.0	33.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	13.0	13.0		13.0	13.0		15.0	15.0		15.0	15.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	33.0	33.0		33.0	33.0		20.0	20.0		20.0	20.0	
Actuated g/C Ratio	0.51	0.51		0.51	0.51		0.31	0.31		0.31	0.31	

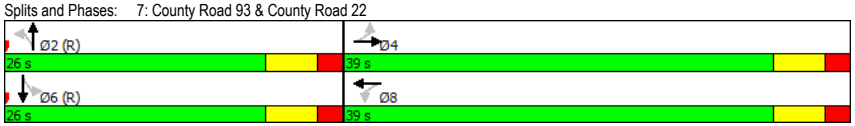
Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.34	0.95		0.53	0.80		0.09	0.47		0.29	0.21	
Control Delay	15.5	37.8		32.9	21.3		16.9	12.5		20.4	12.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	15.5	37.8		32.9	21.3		16.9	12.5		20.4	12.5	
LOS	B	D		C	C		B	B		C	B	
Approach Delay		36.3			22.2			13.0			15.9	
Approach LOS		D			C			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 65			
Actuated Cycle Length: 65			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 65			
Control Type: Pretimed			
Maximum v/c Ratio: 0.95			
Intersection Signal Delay: 26.3		Intersection LOS: C	
Intersection Capacity Utilization 101.5%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 7: County Road 93 & County Road 22



Queues
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	67	886	59	718	31	284	86	116
v/c Ratio	0.34	0.95	0.53	0.80	0.09	0.47	0.29	0.21
Control Delay	15.5	37.8	32.9	21.3	16.9	12.5	20.4	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.5	37.8	32.9	21.3	16.9	12.5	20.4	12.5
Queue Length 50th (m)	4.7	98.4	4.6	67.2	2.8	14.5	8.2	6.7
Queue Length 95th (m)	14.0	#180.0	#22.2	#131.3	8.4	34.1	19.2	17.6
Internal Link Dist (m)		1097.3		281.8		245.5		247.6
Turn Bay Length (m)	180.0		185.0		157.0		150.0	
Base Capacity (vph)	199	930	112	902	358	605	297	552
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.95	0.53	0.80	0.09	0.47	0.29	0.21

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

Lanes, Volumes, Timings
1: County Road 27 & County Road 22

11/16/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	275	17	113	498	173	23	584	107	97	503	40
Future Volume (vph)	40	275	17	113	498	173	23	584	107	97	503	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	110.0		0.0	0.0		0.0	130.0		0.0	125.0		110.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.991			0.970			0.977				0.850
Flt Protected	0.950				0.993		0.950			0.950		
Satd. Flow (prot)	1700	1636	0	0	1712	0	1417	3341	0	1653	1824	1342
Flt Permitted	0.307				0.887		0.160			0.252		
Satd. Flow (perm)	549	1636	0	0	1529	0	239	3341	0	438	1824	1342
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			24			24				50
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		515.9			1538.1			209.3			305.4	
Travel Time (s)		23.2			69.2			9.4			13.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	5%	12%	43%	4%	6%	6%	26%	3%	12%	8%	3%	19%
Adj. Flow (vph)	42	289	18	119	524	182	24	615	113	102	529	42
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	307	0	0	825	0	24	728	0	102	529	42
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Minimum Split (s)	17.1	17.1		17.1	17.1		27.8	27.8		27.8	27.8	27.8
Total Split (s)	54.6	54.6		54.6	54.6		35.4	35.4		35.4	35.4	35.4
Total Split (%)	60.7%	60.7%		60.7%	60.7%		39.3%	39.3%		39.3%	39.3%	39.3%
Maximum Green (s)	47.5	47.5		47.5	47.5		27.6	27.6		27.6	27.6	27.6
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.2	1.2		1.2	1.2		1.9	1.9		1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1			7.1		7.8	7.8		7.8	7.8	7.8
Lead/Lag												
Lead-Lag Optimize?												
Act Effct Green (s)	47.5	47.5			47.5		27.6	27.6		27.6	27.6	27.6
Actuated g/C Ratio	0.53	0.53			0.53		0.31	0.31		0.31	0.31	0.31
v/c Ratio	0.15	0.35			1.01		0.33	0.70		0.76	0.95	0.09
Control Delay	12.6	13.6			56.2		38.7	30.9		65.2	59.1	6.4
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0

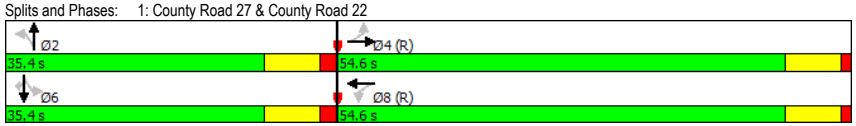
Lanes, Volumes, Timings
1: County Road 27 & County Road 22

11/16/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	12.6	13.6			56.2		38.7	30.9		65.2	59.1	6.4
LOS	B	B			E		D	C		E	E	A
Approach Delay		13.5			56.2			31.1			56.7	
Approach LOS		B			E			C			E	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green			
Natural Cycle: 90			
Control Type: Pretimed			
Maximum v/c Ratio: 1.01			
Intersection Signal Delay: 43.3		Intersection LOS: D	
Intersection Capacity Utilization 126.5%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 1: County Road 27 & County Road 22



Queues
1: County Road 27 & County Road 22

11/16/2016

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	42	307	825	24	728	102	529	42
v/c Ratio	0.15	0.35	1.01	0.33	0.70	0.76	0.95	0.09
Control Delay	12.6	13.6	56.2	38.7	30.9	65.2	59.1	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.6	13.6	56.2	38.7	30.9	65.2	59.1	6.4
Queue Length 50th (m)	3.7	30.1	~143.6	3.4	59.2	16.7	93.4	0.0
Queue Length 95th (m)	9.7	48.2	#230.0	11.9	79.8	#45.5	#157.3	6.3
Internal Link Dist (m)		491.9	1514.1		185.3		281.4	
Turn Bay Length (m)	110.0			130.0		125.0		110.0
Base Capacity (vph)	289	865	818	73	1041	134	559	446
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.35	1.01	0.33	0.70	0.76	0.95	0.09

Intersection Summary

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

Lanes, Volumes, Timings
2: Gill Road & County Road 22

11/16/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	481	8	11	762	16	7	2	10	13	3	3
Future Volume (vph)	10	481	8	11	762	16	7	2	10	13	3	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.9	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.997			0.926			0.980	
Flt Protected		0.999			0.999			0.983			0.966	
Satd. Flow (prot)	0	1673	0	0	1765	0	0	1481	0	0	1779	0
Flt Permitted		0.999			0.999			0.983			0.966	
Satd. Flow (perm)	0	1673	0	0	1765	0	0	1481	0	0	1779	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		1538.1			370.7			296.2			94.4	
Travel Time (s)		69.2			16.7			17.8			6.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	12%	25%	18%	6%	0%	0%	0%	14%	0%	0%	0%
Adj. Flow (vph)	11	506	8	12	802	17	7	2	11	14	3	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	525	0	0	831	0	0	20	0	0	20	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.11	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 56.6% ICU Level of Service B
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
2: Gill Road & County Road 22

11/16/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	481	8	11	762	16	7	2	10	13	3	3
Future Volume (Veh/h)	10	481	8	11	762	16	7	2	10	13	3	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	506	8	12	802	17	7	2	11	14	3	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	819			514			1371	1375	510	1378	1370	810
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	819			514			1371	1375	510	1378	1370	810
tC, single (s)	4.1			4.3			7.1	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.4			3.5	4.0	3.4	3.5	4.0	3.3
p0 queue free %	99			99			94	99	98	88	98	99
cM capacity (veh/h)	818			975			119	143	540	117	144	383

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	525	831	20	20
Volume Left	11	12	7	14
Volume Right	8	17	11	3
cSH	818	975	215	135
Volume to Capacity	0.01	0.01	0.09	0.15
Queue Length 95th (m)	0.3	0.3	2.4	4.0
Control Delay (s)	0.4	0.3	23.5	36.3
Lane LOS	A	A	C	E
Approach Delay (s)	0.4	0.3	23.5	36.3
Approach LOS			C	E

Intersection Summary					
Average Delay			1.2		
Intersection Capacity Utilization			56.6%	ICU Level of Service	B
Analysis Period (min)			15		

Lanes, Volumes, Timings
3: Fox Farm Road & County Road 22/Country Road 22

11/16/2016

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	474	22	39	725	59	105
Future Volume (vph)	474	22	39	725	59	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.994				0.913	
Flt Protected				0.997	0.982	
Satd. Flow (prot)	1800	0	0	1772	1685	0
Flt Permitted				0.997	0.982	
Satd. Flow (perm)	1800	0	0	1772	1685	0
Link Speed (k/h)	80			50	80	
Link Distance (m)	153.6			1063.4	320.8	
Travel Time (s)	6.9			76.6	14.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	20%	0%	6%	0%	0%
Adj. Flow (vph)	499	23	41	763	62	111
Shared Lane Traffic (%)						
Lane Group Flow (vph)	522	0	0	804	173	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary				
Area Type:	Other			
Control Type: Unsignalized				
Intersection Capacity Utilization	86.3%		ICU Level of Service	E
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
3: Fox Farm Road & County Road 22/Country Road 22

11/16/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	474	22	39	725	59	105
Future Volume (Veh/h)	474	22	39	725	59	105
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	499	23	41	763	62	111
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			522		1356	510
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			522		1356	510
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		61	80
cM capacity (veh/h)			1055		160	567

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	522	804	173
Volume Left	0	41	62
Volume Right	23	0	111
cSH	1700	1055	296
Volume to Capacity	0.31	0.04	0.58
Queue Length 95th (m)	0.0	1.0	27.5
Control Delay (s)	0.0	1.0	32.9
Lane LOS		A	D
Approach Delay (s)	0.0	1.0	32.9
Approach LOS			D

Intersection Summary			
Average Delay		4.3	
Intersection Capacity Utilization		86.3%	ICU Level of Service E
Analysis Period (min)		15	

Lanes, Volumes, Timings
4: Old Second Road

11/16/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	573	7	5	763	14	6	8	8	7	5	3
Future Volume (vph)	3	573	7	5	763	14	6	8	8	7	5	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.998			0.951			0.973	
Flt Protected								0.987			0.977	
Satd. Flow (prot)	0	1700	0	0	1771	0	0	1554	0	0	1677	0
Flt Permitted								0.987			0.977	
Satd. Flow (perm)	0	1700	0	0	1771	0	0	1554	0	0	1677	0
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		1063.4			661.0			398.3			389.2	
Travel Time (s)		76.6			47.6			17.9			17.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	10%	42%	0%	6%	0%	16%	25%	0%	14%	0%	0%
Adj. Flow (vph)	3	603	7	5	803	15	6	8	8	7	5	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	613	0	0	823	0	0	22	0	0	15	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 54.5%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
4: Old Second Road

11/16/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	573	7	5	763	14	6	8	8	7	5	3
Future Volume (Veh/h)	3	573	7	5	763	14	6	8	8	7	5	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	3	603	7	5	803	15	6	8	8	7	5	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	818			610			1438	1440	606	1445	1436	810
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	818			610			1438	1440	606	1445	1436	810
tC, single (s)	4.1			4.1			7.3	6.8	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.2	3.3	3.6	4.0	3.3
p0 queue free %	100			99			94	93	98	93	96	99
cM capacity (veh/h)	819			979			99	118	500	96	133	383

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	613	823	22	15
Volume Left	3	5	6	7
Volume Right	7	15	8	3
cSH	819	979	152	126
Volume to Capacity	0.00	0.01	0.14	0.12
Queue Length 95th (m)	0.1	0.1	3.9	3.1
Control Delay (s)	0.1	0.1	32.7	37.3
Lane LOS	A	A	D	E
Approach Delay (s)	0.1	0.1	32.7	37.3
Approach LOS			D	E

Intersection Summary					
Average Delay			1.0		
Intersection Capacity Utilization			54.5%	ICU Level of Service	A
Analysis Period (min)			15		

Lanes, Volumes, Timings
5: Country Road 22 & Highway 400 South Ramp

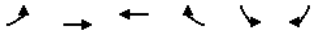
11/16/2016

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	113	471	679	307	8	102
Future Volume (vph)	113	471	679	307	8	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.874	
Flt Protected		0.990			0.997	
Satd. Flow (prot)	0	1685	968	882	1582	0
Flt Permitted		0.990			0.997	
Satd. Flow (perm)	0	1685	968	882	1582	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		661.0	382.0		499.1	
Travel Time (s)		47.6	27.5		35.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	12%	10%	94%	81%	50%	0%
Adj. Flow (vph)	119	496	715	323	8	107
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	615	715	323	115	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: Country Road 22 & Highway 400 South Ramp

11/16/2016



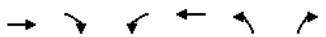
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	113	471	679	307	8	102
Future Volume (Veh/h)	113	471	679	307	8	102
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	119	496	715	323	8	107
Pedestrians						
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	715				1449	715
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	715				1449	715
tC, single (s)	4.2				6.9	6.2
tC, 2 stage (s)						
tF (s)	2.3				4.0	3.3
p0 queue free %	86				92	75
cM capacity (veh/h)	841				97	434

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	615	715	323	115
Volume Left	119	0	0	8
Volume Right	0	0	323	107
cSH	841	1700	1700	350
Volume to Capacity	0.14	0.42	0.19	0.33
Queue Length 95th (m)	3.9	0.0	0.0	11.2
Control Delay (s)	3.5	0.0	0.0	20.3
Lane LOS	A			C
Approach Delay (s)	3.5	0.0		20.3
Approach LOS				C

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		

Lanes, Volumes, Timings
6: Highway 400 North Ramp & County Road 22

11/16/2016



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	394	80	28	950	52	159
Future Volume (vph)	394	80	28	950	52	159
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.999	0.950	
Satd. Flow (prot)	1693	1465	0	1721	1653	1365
Flt Permitted				0.999	0.950	
Satd. Flow (perm)	1693	1465	0	1721	1653	1365
Link Speed (k/h)	50			80	50	
Link Distance (m)	382.0			36.2	392.3	
Travel Time (s)	27.5			1.6	28.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	11%	9%	12%	9%	8%	17%
Adj. Flow (vph)	415	84	29	1000	55	167
Shared Lane Traffic (%)						
Lane Group Flow (vph)	415	84	0	1029	55	167
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6: Highway 400 North Ramp & County Road 22

11/16/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	394	80	28	950	52	159
Future Volume (Veh/h)	394	80	28	950	52	159
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	415	84	29	1000	55	167
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			415		1473	415
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			415		1473	415
tC, single (s)			4.2		6.5	6.4
tC, 2 stage (s)						
tF (s)			2.3		3.6	3.5
p0 queue free %			97		58	72
cM capacity (veh/h)			1092		132	606

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2
Volume Total	415	84	1029	55	167
Volume Left	0	0	29	55	0
Volume Right	0	84	0	0	167
cSH	1700	1700	1092	132	606
Volume to Capacity	0.24	0.05	0.03	0.42	0.28
Queue Length 95th (m)	0.0	0.0	0.7	14.5	8.9
Control Delay (s)	0.0	0.0	0.8	50.7	13.2
Lane LOS			A	F	B
Approach Delay (s)	0.0		0.8	22.5	
Approach LOS				C	

Intersection Summary				
Average Delay	3.3			
Intersection Capacity Utilization	82.6%	ICU Level of Service		E
Analysis Period (min)	15			

Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/16/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	485	44	75	817	106	70	68	40	115	79	107
Future Volume (vph)	54	485	44	75	817	106	70	68	40	115	79	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	180.0		0.0	185.0		0.0	157.0		0.0	150.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988			0.983			0.945			0.914	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1668	1654	0	1428	1705	0	1750	1633	0	1733	1618	0
Flt Permitted	0.106			0.376			0.592			0.684		
Satd. Flow (perm)	186	1654	0	565	1705	0	1090	1633	0	1248	1618	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			15			35			82	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1121.3			305.8			269.5			271.6	
Travel Time (s)		80.7			22.0			19.4			19.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	13%	4%	25%	9%	3%	2%	8%	10%	3%	9%	4%
Adj. Flow (vph)	57	511	46	79	860	112	74	72	42	121	83	113
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	557	0	79	972	0	74	114	0	121	196	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	24.0	24.0		24.0	24.0		26.0	26.0		26.0	26.0	
Total Split (s)	54.0	54.0		54.0	54.0		26.0	26.0		26.0	26.0	
Total Split (%)	67.5%	67.5%		67.5%	67.5%		32.5%	32.5%		32.5%	32.5%	
Maximum Green (s)	48.0	48.0		48.0	48.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	13.0	13.0		13.0	13.0		15.0	15.0		15.0	15.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	48.0	48.0		48.0	48.0		20.0	20.0		20.0	20.0	
Actuated g/C Ratio	0.60	0.60		0.60	0.60		0.25	0.25		0.25	0.25	

Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/16/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.51	0.56		0.23	0.94		0.27	0.26		0.39	0.42	
Control Delay	30.1	12.1		9.7	34.1		27.5	18.9		29.4	17.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	30.1	12.1		9.7	34.1		27.5	18.9		29.4	17.7	
LOS	C	B		A	C		C	B		C	B	
Approach Delay		13.8			32.3			22.3			22.1	
Approach LOS		B			C			C			C	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Pretimed
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 24.7 Intersection LOS: C
Intersection Capacity Utilization 110.7% ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 7: County Road 93 & County Road 22

Queues
7: County Road 93 & County Road 22

11/16/2016

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	57	557	79	972	74	114	121	196
v/c Ratio	0.51	0.56	0.23	0.94	0.27	0.26	0.39	0.42
Control Delay	30.1	12.1	9.7	34.1	27.5	18.9	29.4	17.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.1	12.1	9.7	34.1	27.5	18.9	29.4	17.7
Queue Length 50th (m)	4.8	47.5	5.3	128.2	9.6	10.0	16.1	14.7
Queue Length 95th (m)	#23.7	75.3	12.8	#226.6	21.2	23.4	31.7	33.4
Internal Link Dist (m)		1097.3		281.8		245.5		247.6
Turn Bay Length (m)	180.0		185.0		157.0		150.0	
Base Capacity (vph)	111	996	339	1029	272	434	312	466
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.56	0.23	0.94	0.27	0.26	0.39	0.42

Intersection Summary

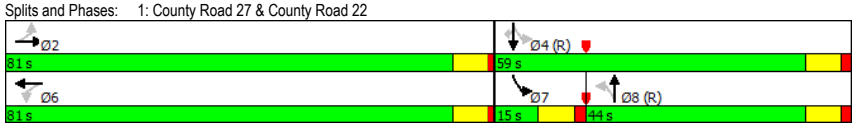
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	733	16	80	448	165	27	831	233	163	570	66
Future Volume (vph)	57	733	16	80	448	165	27	831	233	163	570	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	110.0		0.0	0.0		0.0	130.0		0.0	125.0		110.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.997			0.968			0.967				0.850
Flt Protected	0.950				0.994		0.950			0.950		
Satd. Flow (prot)	1767	1781	0	0	1714	0	1700	3452	0	1668	1842	1597
Flt Permitted	0.321				0.390		0.177			0.091		
Satd. Flow (perm)	597	1781	0	0	673	0	317	3452	0	160	1842	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1			17			25				69
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		515.9			1538.1			209.3			305.4	
Travel Time (s)		23.2			69.2			9.4			13.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	5%	13%	8%	7%	0%	5%	0%	0%	7%	2%	0%
Adj. Flow (vph)	60	772	17	84	472	174	28	875	245	172	600	69
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	789	0	0	730	0	28	1120	0	172	600	69
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8			4		4
Minimum Split (s)	17.1	17.1		17.1	17.1		27.8	27.8		12.8	27.8	27.8
Total Split (s)	81.0	81.0		81.0	81.0		44.0	44.0		15.0	59.0	59.0
Total Split (%)	57.9%	57.9%		57.9%	57.9%		31.4%	31.4%		10.7%	42.1%	42.1%
Maximum Green (s)	73.9	73.9		73.9	73.9		36.2	36.2		7.2	51.2	51.2
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.2	1.2		1.2	1.2		1.9	1.9		1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1			7.1		7.8	7.8		7.8	7.8	7.8
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Act Effct Green (s)	73.9	73.9			73.9		36.2	36.2		51.2	51.2	51.2
Actuated g/C Ratio	0.53	0.53			0.53		0.26	0.26		0.37	0.37	0.37
v/c Ratio	0.19	0.84			2.01		0.35	1.23		1.26	0.89	0.11
Control Delay	19.4	37.8			487.4		56.3	155.4		195.7	58.7	6.7
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	19.4	37.8			487.4		56.3	155.4		195.7	58.7	6.7
LOS	B	D			F		E	F		F	E	A
Approach Delay		36.5			487.4			153.0			82.5	
Approach LOS		D			F			F			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green			
Natural Cycle: 150			
Control Type: Pretimed			
Maximum v/c Ratio: 2.01			
Intersection Signal Delay: 177.1		Intersection LOS: F	
Intersection Capacity Utilization 149.1%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 1: County Road 27 & County Road 22



Queues
1: County Road 27 & County Road 22

11/15/2016

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	60	789	730	28	1120	172	600	69
v/c Ratio	0.19	0.84	2.01	0.35	1.23	1.26	0.89	0.11
Control Delay	19.4	37.8	487.4	56.3	155.4	195.7	58.7	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.4	37.8	487.4	56.3	155.4	195.7	58.7	6.7
Queue Length 50th (m)	8.9	189.1	~227.7	6.7	~209.3	~47.6	163.7	0.0
Queue Length 95th (m)	18.6	254.8	#307.4	17.8	#254.2	#97.2	#234.1	10.5
Internal Link Dist (m)		491.9	1514.1		185.3		281.4	
Turn Bay Length (m)	110.0			130.0		125.0		110.0
Base Capacity (vph)	315	940	363	81	911	136	673	627
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.84	2.01	0.35	1.23	1.26	0.89	0.11

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Lanes, Volumes, Timings
2: Gill Road & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	1155	10	13	743	17	3	2	2	18	1	18
Future Volume (vph)	21	1155	10	13	743	17	3	2	2	18	1	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.9	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.997			0.961			0.934	
Flt Protected		0.999			0.999			0.979			0.976	
Satd. Flow (prot)	0	1821	0	0	1786	0	0	1649	0	0	1664	0
Flt Permitted		0.999			0.999			0.979			0.976	
Satd. Flow (perm)	0	1821	0	0	1786	0	0	1649	0	0	1664	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		1538.1			370.7			296.2			94.4	
Travel Time (s)		69.2			16.7			17.8			6.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	5%	0%	5%	0%	0%	0%	0%	6%	0%	0%
Adj. Flow (vph)	22	1216	11	14	782	18	3	2	2	19	1	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1249	0	0	814	0	0	7	0	0	39	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.11	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 82.7% ICU Level of Service E
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
2: Gill Road & County Road 22

11/15/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	1155	10	13	743	17	3	2	2	18	1	18
Future Volume (Veh/h)	21	1155	10	13	743	17	3	2	2	18	1	18
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	22	1216	11	14	782	18	3	2	2	19	1	19
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	800			1227			2104	2094	1222	2088	2090	791
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	800			1227			2104	2094	1222	2088	2090	791
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	97			98			91	96	99	45	98	95
cM capacity (veh/h)	832			575			34	50	221	35	51	393

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	1249	814	7	39
Volume Left	22	14	3	19
Volume Right	11	18	2	19
cSH	832	575	51	63
Volume to Capacity	0.03	0.02	0.14	0.61
Queue Length 95th (m)	0.7	0.6	3.5	20.7
Control Delay (s)	1.0	0.7	85.7	127.2
Lane LOS	A	A	F	F
Approach Delay (s)	1.0	0.7	85.7	127.2
Approach LOS			F	F

Intersection Summary				
Average Delay			3.5	
Intersection Capacity Utilization			82.7%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
3: Fox Farm Road & County Road 22/Country Road 22

11/15/2016

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1165	62	115	739	37	67
Future Volume (vph)	1165	62	115	739	37	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.993				0.913	
Flt Protected				0.993	0.983	
Satd. Flow (prot)	1814	0	0	1776	1686	0
Flt Permitted				0.993	0.983	
Satd. Flow (perm)	1814	0	0	1776	1686	0
Link Speed (k/h)	80			50	80	
Link Distance (m)	153.6			1063.4	320.8	
Travel Time (s)	6.9			76.6	14.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	0%	12%	4%	0%	0%
Adj. Flow (vph)	1226	65	121	778	39	71
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1291	0	0	899	110	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	126.5%	ICU Level of Service H	
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: Fox Farm Road & County Road 22/Country Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1165	62	115	739	37	67
Future Volume (Veh/h)	1165	62	115	739	37	67
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1226	65	121	778	39	71
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			1291		2278	1258
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1291		2278	1258
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			76		0	66
cM capacity (veh/h)			505		34	210

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1291	899	110
Volume Left	0	121	39
Volume Right	65	0	71
cSH	1700	505	74
Volume to Capacity	0.76	0.24	1.49
Queue Length 95th (m)	0.0	7.4	72.5
Control Delay (s)	0.0	7.4	375.4
Lane LOS		A	F
Approach Delay (s)	0.0	7.4	375.4
Approach LOS			F

Intersection Summary			
Average Delay		20.9	
Intersection Capacity Utilization		126.5%	ICU Level of Service H
Analysis Period (min)		15	

Lanes, Volumes, Timings
4: Old Second Road

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	1222	8	7	833	23	5	16	9	14	5	6
Future Volume (vph)	4	1222	8	7	833	23	5	16	9	14	5	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.999			0.996			0.961			0.969	
Flt Protected								0.992			0.972	
Satd. Flow (prot)	0	1787	0	0	1800	0	0	1727	0	0	1587	0
Flt Permitted								0.992			0.972	
Satd. Flow (perm)	0	1787	0	0	1800	0	0	1727	0	0	1587	0
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		1063.4			661.0			398.3			389.2	
Travel Time (s)		76.6			47.6			17.9			17.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	5%	16%	16%	4%	0%	7%	0%	9%	20%	0%	0%
Adj. Flow (vph)	4	1286	8	7	877	24	5	17	9	15	5	6
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1298	0	0	908	0	0	31	0	0	26	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 77.7%		ICU Level of Service D	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
4: Old Second Road

11/15/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	1222	8	7	833	23	5	16	9	14	5	6
Future Volume (Veh/h)	4	1222	8	7	833	23	5	16	9	14	5	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	1286	8	7	877	24	5	17	9	15	5	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	901			1294			2210	2213	1290	2218	2205	889
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	901			1294			2210	2213	1290	2218	2205	889
tC, single (s)	4.1			4.3			7.2	6.5	6.3	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.4	3.7	4.0	3.3
p0 queue free %	99			99			81	61	95	17	89	98
cM capacity (veh/h)	763			491			27	44	193	18	44	345

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	1298	908	31	26
Volume Left	4	7	5	15
Volume Right	8	24	9	6
cSH	763	491	50	27
Volume to Capacity	0.01	0.01	0.62	0.96
Queue Length 95th (m)	0.1	0.3	19.4	24.5
Control Delay (s)	0.2	0.5	157.6	370.2
Lane LOS	A	A	F	F
Approach Delay (s)	0.2	0.5	157.6	370.2
Approach LOS			F	F

Intersection Summary				
Average Delay			6.7	
Intersection Capacity Utilization			77.7%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
5: Country Road 22 & Highway 400 South Ramp

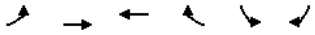
11/15/2016

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	163	1066	730	184	16	117
Future Volume (vph)	163	1066	730	184	16	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.881	
Flt Protected		0.993			0.994	
Satd. Flow (prot)	0	1787	1824	1581	1583	0
Flt Permitted		0.993			0.994	
Satd. Flow (perm)	0	1787	1824	1581	1583	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		661.0	382.0		499.1	
Travel Time (s)		47.6	27.5		35.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	4%	3%	1%	25%	1%
Adj. Flow (vph)	172	1122	768	194	17	123
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1294	768	194	140	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	121.6%	ICU Level of Service H	
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: Country Road 22 & Highway 400 South Ramp

11/15/2016



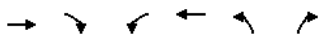
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	163	1066	730	184	16	117
Future Volume (Veh/h)	163	1066	730	184	16	117
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	172	1122	768	194	17	123
Pedestrians						
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	768				2234	768
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	768				2234	768
tC, single (s)	4.2				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.7	3.3
p0 queue free %	79				46	69
cM capacity (veh/h)	824				32	403

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	1294	768	194	140
Volume Left	172	0	0	17
Volume Right	0	0	194	123
cSH	824	1700	1700	166
Volume to Capacity	0.21	0.45	0.11	0.84
Queue Length 95th (m)	6.3	0.0	0.0	46.3
Control Delay (s)	7.0	0.0	0.0	88.4
Lane LOS	A			F
Approach Delay (s)	7.0	0.0		88.4
Approach LOS				F

Intersection Summary			
Average Delay	8.9		
Intersection Capacity Utilization	121.6%	ICU Level of Service	H
Analysis Period (min)	15		

Lanes, Volumes, Timings
6: Highway 400 North Ramp & County Road 22

11/15/2016



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	792	257	40	779	113	378
Future Volume (vph)	792	257	40	779	113	378
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.998	0.950	
Satd. Flow (prot)	1824	1581	0	1802	1785	1566
Flt Permitted				0.998	0.950	
Satd. Flow (perm)	1824	1581	0	1802	1785	1566
Link Speed (k/h)	50			80	50	
Link Distance (m)	382.0			36.2	87.6	
Travel Time (s)	27.5			1.6	6.3	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	1%	5%	4%	0%	2%
Adj. Flow (vph)	834	271	42	820	119	398
Shared Lane Traffic (%)						
Lane Group Flow (vph)	834	271	0	862	119	398
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	86.5%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6: Highway 400 North Ramp & County Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	792	257	40	779	113	378
Future Volume (Veh/h)	792	257	40	779	113	378
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	834	271	42	820	119	398
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			834		1738	834
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			834		1738	834
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		0	0
cM capacity (veh/h)			786		92	368

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2
Volume Total	834	271	862	119	398
Volume Left	0	0	42	119	0
Volume Right	0	271	0	0	398
cSH	1700	1700	786	92	368
Volume to Capacity	0.49	0.16	0.05	1.30	1.08
Queue Length 95th (m)	0.0	0.0	1.4	68.7	113.9
Control Delay (s)	0.0	0.0	1.4	276.0	104.5
Lane LOS			A	F	F
Approach Delay (s)	0.0		1.4	144.0	
Approach LOS				F	

Intersection Summary			
Average Delay	30.5		
Intersection Capacity Utilization	86.5%	ICU Level of Service	E
Analysis Period (min)	15		

Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	987	68	62	711	178	69	133	156	127	67	82
Future Volume (vph)	146	987	68	62	711	178	69	133	156	127	67	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	180.0		0.0	185.0		0.0	157.0		0.0	150.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990			0.970			0.919			0.918	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	1826	0	1733	1749	0	1623	1695	0	1785	1672	0
Flt Permitted	0.051			0.054			0.657			0.189		
Satd. Flow (perm)	95	1826	0	99	1749	0	1122	1695	0	355	1672	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			14			37			43	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1121.3			305.8			269.5			271.6	
Travel Time (s)		80.7			22.0			19.4			19.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	2%	0%	3%	4%	5%	10%	4%	0%	0%	7%	0%
Adj. Flow (vph)	154	1039	72	65	748	187	73	140	164	134	71	86
Shared Lane Traffic (%)												
Lane Group Flow (vph)	154	1111	0	65	935	0	73	304	0	134	157	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	pm+pt	NA		pm+pt	NA		Perm	NA		pm+pt	NA	
Protected Phases	7	4		3	8			2		1	6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	9.5	24.0		9.5	24.0		26.0	26.0		9.5	26.0	
Total Split (s)	15.4	86.0		9.8	80.4		33.2	33.2		11.0	44.2	
Total Split (%)	11.0%	61.4%		7.0%	57.4%		23.7%	23.7%		7.9%	31.6%	
Maximum Green (s)	11.4	80.0		5.3	74.4		27.2	27.2		7.0	38.2	
Yellow Time (s)	3.0	4.0		3.5	4.0		4.0	4.0		3.0	4.0	
All-Red Time (s)	1.0	2.0		1.0	2.0		2.0	2.0		1.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	4.0	6.0		4.5	6.0		6.0	6.0		4.0	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lag	Lag		Lead		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes		
Walk Time (s)		13.0			13.0		15.0	15.0			15.0	
Flash Dont Walk (s)		5.0			5.0		5.0	5.0			5.0	
Pedestrian Calls (#/hr)		0			0		0	0			0	
Act Effct Green (s)	91.8	80.0		81.2	74.4		27.2	27.2		40.2	38.2	
Actuated g/C Ratio	0.66	0.57		0.58	0.53		0.19	0.19		0.29	0.27	

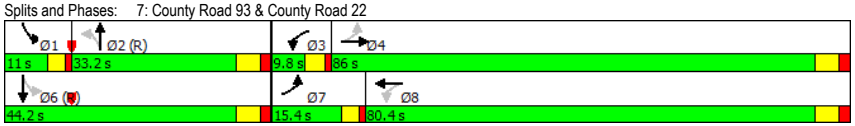
Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.78	1.06		0.55	1.00		0.34	0.85		0.77	0.32	
Control Delay	57.0	76.0		33.0	61.5		53.7	69.2		69.4	31.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	57.0	76.0		33.0	61.5		53.7	69.2		69.4	31.2	
LOS	E	E		C	E		D	E		E	C	
Approach Delay		73.7			59.7			66.2			48.8	
Approach LOS		E			E			E			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 130			
Control Type: Pretimed			
Maximum v/c Ratio: 1.06			
Intersection Signal Delay: 65.5		Intersection LOS: E	
Intersection Capacity Utilization 112.3%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 7: County Road 93 & County Road 22



Queues
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	154	1111	65	935	73	304	134	157
v/c Ratio	0.78	1.06	0.55	1.00	0.34	0.85	0.77	0.32
Control Delay	57.0	76.0	33.0	61.5	53.7	69.2	69.4	31.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.0	76.0	33.0	61.5	53.7	69.2	69.4	31.2
Queue Length 50th (m)	27.4	~355.9	6.4	261.7	18.5	76.6	30.2	26.2
Queue Length 95th (m)	#63.6	#441.1	18.6	#363.7	34.9	#126.8	#60.5	47.2
Internal Link Dist (m)		1097.3		281.8		245.5		247.6
Turn Bay Length (m)	180.0		185.0		157.0		150.0	
Base Capacity (vph)	198	1045	119	936	217	359	173	487
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	1.06	0.55	1.00	0.34	0.85	0.77	0.32

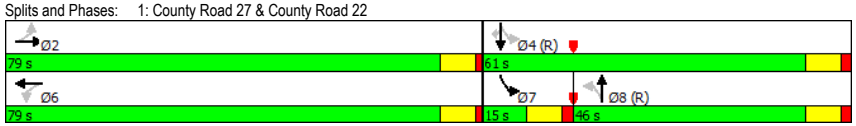
Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	577	23	92	437	178	17	758	222	164	648	33
Future Volume (vph)	56	577	23	92	437	178	17	758	222	164	648	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	110.0		0.0	0.0		0.0	130.0		0.0	125.0		110.0
Storage Lanes	1		0	0		0	1		0	1		1
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt		0.994			0.966			0.966				0.850
Flt Protected	0.950				0.994		0.950			0.950		
Satd. Flow (prot)	1767	1774	0	0	1712	0	1700	3449	0	1668	1842	1597
Flt Permitted	0.313				0.524		0.105			0.087		
Satd. Flow (perm)	582	1774	0	0	903	0	188	3449	0	153	1842	1597
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			18			27				32
Link Speed (k/h)		80			80			80			80	
Link Distance (m)		515.9			1538.1			209.3			305.4	
Travel Time (s)		23.2			69.2			9.4			13.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	5%	13%	8%	7%	0%	5%	0%	0%	7%	2%	0%
Adj. Flow (vph)	59	607	24	97	460	187	18	798	234	173	682	35
Shared Lane Traffic (%)												
Lane Group Flow (vph)	59	631	0	0	744	0	18	1032	0	173	682	35
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		pm+pt	NA	Perm
Protected Phases		2			6			8		7	4	
Permitted Phases	2			6			8			4		4
Minimum Split (s)	17.1	17.1		17.1	17.1		27.8	27.8		12.8	27.8	27.8
Total Split (s)	79.0	79.0		79.0	79.0		46.0	46.0		15.0	61.0	61.0
Total Split (%)	56.4%	56.4%		56.4%	56.4%		32.9%	32.9%		10.7%	43.6%	43.6%
Maximum Green (s)	71.9	71.9		71.9	71.9		38.2	38.2		7.2	53.2	53.2
Yellow Time (s)	5.9	5.9		5.9	5.9		5.9	5.9		5.9	5.9	5.9
All-Red Time (s)	1.2	1.2		1.2	1.2		1.9	1.9		1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	7.1	7.1			7.1		7.8	7.8		7.8	7.8	7.8
Lead/Lag							Lag	Lag		Lead		
Lead-Lag Optimize?							Yes	Yes		Yes		
Act Effct Green (s)	71.9	71.9			71.9		38.2	38.2		53.2	53.2	53.2
Actuated g/C Ratio	0.51	0.51			0.51		0.27	0.27		0.38	0.38	0.38
v/c Ratio	0.20	0.69			1.58		0.35	1.07		1.27	0.98	0.06
Control Delay	20.7	30.6			296.4		63.4	97.9		197.6	71.4	9.9
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	20.7	30.6			296.4		63.4	97.9		197.6	71.4	9.9
LOS	C	C			F		E	F		F	E	A
Approach Delay		29.7			296.4			97.3			93.5	
Approach LOS		C			F			F			F	

Intersection Summary			
Area Type:	Other		
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 0 (0%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green			
Natural Cycle: 150			
Control Type: Pretimed			
Maximum v/c Ratio: 1.58			
Intersection Signal Delay: 126.4		Intersection LOS: F	
Intersection Capacity Utilization 146.3%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 1: County Road 27 & County Road 22



Queues
1: County Road 27 & County Road 22

11/15/2016

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	59	631	744	18	1032	173	682	35
v/c Ratio	0.20	0.69	1.58	0.35	1.07	1.27	0.98	0.06
Control Delay	20.7	30.6	296.4	63.4	97.9	197.6	71.4	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.7	30.6	296.4	63.4	97.9	197.6	71.4	9.9
Queue Length 50th (m)	9.1	134.7	~306.7	4.3	~172.6	~48.2	194.5	0.5
Queue Length 95th (m)	18.9	181.8	#387.0	13.7	#217.2	#98.5	#278.2	8.1
Internal Link Dist (m)		491.9	1514.1		185.3		281.4	
Turn Bay Length (m)	110.0			130.0		125.0		110.0
Base Capacity (vph)	298	912	472	51	960	136	699	626
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.69	1.58	0.35	1.07	1.27	0.98	0.06

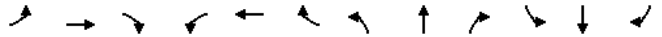
Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Lanes, Volumes, Timings
2: Gill Road & County Road 22

11/15/2016



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	964	18	17	703	10	11	3	9	15	0	12
Future Volume (vph)	13	964	18	17	703	10	11	3	9	15	0	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.9	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.998			0.949			0.939	
Flt Protected		0.999			0.999			0.976			0.973	
Satd. Flow (prot)	0	1819	0	0	1787	0	0	1623	0	0	1662	0
Flt Permitted		0.999			0.999			0.976			0.973	
Satd. Flow (perm)	0	1819	0	0	1787	0	0	1623	0	0	1662	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		1538.1			370.7			296.2			94.4	
Travel Time (s)		69.2			16.7			17.8			6.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	5%	0%	5%	0%	0%	0%	0%	6%	0%	0%
Adj. Flow (vph)	14	1015	19	18	740	11	12	3	9	16	0	13
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1048	0	0	769	0	0	24	0	0	29	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.11	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 68.0% ICU Level of Service C
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
2: Gill Road & County Road 22

11/15/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	964	18	17	703	10	11	3	9	15	0	12
Future Volume (Veh/h)	13	964	18	17	703	10	11	3	9	15	0	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	14	1015	19	18	740	11	12	3	9	16	0	13
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	751			1034			1847	1840	1024	1844	1844	746
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	751			1034			1847	1840	1024	1844	1844	746
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	98			97			78	96	97	69	100	97
cM capacity (veh/h)	868			680			54	73	288	51	73	417

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	1048	769	24	29
Volume Left	14	18	12	16
Volume Right	19	11	9	13
cSH	868	680	82	84
Volume to Capacity	0.02	0.03	0.29	0.34
Queue Length 95th (m)	0.4	0.7	8.7	10.6
Control Delay (s)	0.5	0.7	66.2	68.8
Lane LOS	A	A	F	F
Approach Delay (s)	0.5	0.7	66.2	68.8
Approach LOS			F	F

Intersection Summary					
Average Delay			2.5		
Intersection Capacity Utilization			68.0%	ICU Level of Service	C
Analysis Period (min)			15		

Lanes, Volumes, Timings
3: Fox Farm Road & County Road 22/Country Road 22

11/15/2016

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	958	65	117	690	35	63
Future Volume (vph)	958	65	117	690	35	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.991				0.913	
Flt Protected				0.993	0.982	
Satd. Flow (prot)	1811	0	0	1774	1685	0
Flt Permitted				0.993	0.982	
Satd. Flow (perm)	1811	0	0	1774	1685	0
Link Speed (k/h)	80			50	80	
Link Distance (m)	153.6			1063.4	320.8	
Travel Time (s)	6.9			76.6	14.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	0%	12%	4%	0%	0%
Adj. Flow (vph)	1008	68	123	726	37	66
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1076	0	0	849	103	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary				
Area Type:	Other			
Control Type: Unsignalized				
Intersection Capacity Utilization	113.0%		ICU Level of Service H	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
3: Fox Farm Road & County Road 22/Country Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	958	65	117	690	35	63
Future Volume (Veh/h)	958	65	117	690	35	63
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1008	68	123	726	37	66
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			1076		2014	1042
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1076		2014	1042
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			80		29	77
cM capacity (veh/h)			612		52	281

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	1076	849	103
Volume Left	0	123	37
Volume Right	68	0	66
cSH	1700	612	109
Volume to Capacity	0.63	0.20	0.94
Queue Length 95th (m)	0.0	6.0	46.7
Control Delay (s)	0.0	5.5	144.2
Lane LOS		A	F
Approach Delay (s)	0.0	5.5	144.2
Approach LOS			F

Intersection Summary			
Average Delay		9.6	
Intersection Capacity Utilization		113.0%	ICU Level of Service H
Analysis Period (min)		15	

Lanes, Volumes, Timings
4: Old Second Road

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	988	12	6	783	48	14	24	11	10	9	5
Future Volume (vph)	13	988	12	6	783	48	14	24	11	10	9	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.992			0.969			0.973	
Flt Protected		0.999						0.986			0.978	
Satd. Flow (prot)	0	1783	0	0	1795	0	0	1725	0	0	1643	0
Flt Permitted		0.999						0.986			0.978	
Satd. Flow (perm)	0	1783	0	0	1795	0	0	1725	0	0	1643	0
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		1063.4			661.0			398.3			389.2	
Travel Time (s)		76.6			47.6			17.9			17.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	5%	16%	16%	4%	0%	7%	0%	9%	20%	0%	0%
Adj. Flow (vph)	14	1040	13	6	824	51	15	25	12	11	9	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1067	0	0	881	0	0	52	0	0	25	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	71.3%	ICU Level of Service C	
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
4: Old Second Road

11/15/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	988	12	6	783	48	14	24	11	10	9	5
Future Volume (Veh/h)	13	988	12	6	783	48	14	24	11	10	9	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	14	1040	13	6	824	51	15	25	12	11	9	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	875			1053			1946	1962	1046	1960	1942	850
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	875			1053			1946	1962	1046	1960	1942	850
tC, single (s)	4.1			4.3			7.2	6.5	6.3	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.4	3.7	4.0	3.3
p0 queue free %	98			99			63	60	96	60	86	99
cM capacity (veh/h)	780			610			41	62	269	27	64	364

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	1067	881	52	25
Volume Left	14	6	15	11
Volume Right	13	51	12	5
cSH	780	610	64	45
Volume to Capacity	0.02	0.01	0.81	0.56
Queue Length 95th (m)	0.4	0.2	29.9	16.5
Control Delay (s)	0.6	0.3	169.2	158.5
Lane LOS	A	A	F	F
Approach Delay (s)	0.6	0.3	169.2	158.5
Approach LOS			F	F

Intersection Summary				
Average Delay	6.7			
Intersection Capacity Utilization	71.3%	ICU Level of Service	C	
Analysis Period (min)	15			

Lanes, Volumes, Timings
5: Country Road 22 & Highway 400 South Ramp

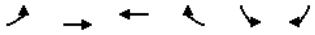
11/15/2016

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	184	821	712	221	12	116
Future Volume (vph)	184	821	712	221	12	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.878	
Flt Protected		0.991			0.995	
Satd. Flow (prot)	0	1781	1824	1581	1589	0
Flt Permitted		0.991			0.995	
Satd. Flow (perm)	0	1781	1824	1581	1589	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		661.0	382.0		499.1	
Travel Time (s)		47.6	27.5		35.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	4%	3%	1%	25%	1%
Adj. Flow (vph)	194	864	749	233	13	122
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	1058	749	233	135	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	108.7%	ICU Level of Service	G
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: Country Road 22 & Highway 400 South Ramp

11/15/2016



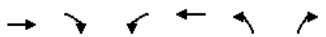
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	184	821	712	221	12	116
Future Volume (Veh/h)	184	821	712	221	12	116
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	194	864	749	233	13	122
Pedestrians						
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	749				2001	749
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	749				2001	749
tC, single (s)	4.2				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.7	3.3
p0 queue free %	77				70	70
cM capacity (veh/h)	838				44	413

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	1058	749	233	135
Volume Left	194	0	0	13
Volume Right	0	0	233	122
cSH	838	1700	1700	228
Volume to Capacity	0.23	0.44	0.14	0.59
Queue Length 95th (m)	7.2	0.0	0.0	27.0
Control Delay (s)	6.0	0.0	0.0	41.5
Lane LOS	A			E
Approach Delay (s)	6.0	0.0		41.5
Approach LOS				E

Intersection Summary			
Average Delay	5.5		
Intersection Capacity Utilization	108.7%	ICU Level of Service	G
Analysis Period (min)	15		

Lanes, Volumes, Timings
6: Highway 400 North Ramp & County Road 22

11/15/2016



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	707	111	38	789	136	406
Future Volume (vph)	707	111	38	789	136	406
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.998	0.950	
Satd. Flow (prot)	1824	1581	0	1802	1785	1566
Flt Permitted				0.998	0.950	
Satd. Flow (perm)	1824	1581	0	1802	1785	1566
Link Speed (k/h)	50			80	50	
Link Distance (m)	382.0			36.2	392.3	
Travel Time (s)	27.5			1.6	28.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	1%	5%	4%	0%	2%
Adj. Flow (vph)	744	117	40	831	143	427
Shared Lane Traffic (%)						
Lane Group Flow (vph)	744	117	0	871	143	427
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	86.6%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6: Highway 400 North Ramp & County Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	707	111	38	789	136	406
Future Volume (Veh/h)	707	111	38	789	136	406
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	744	117	40	831	143	427
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			744		1655	744
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			744		1655	744
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		0	0
cM capacity (veh/h)			850		104	415

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2
Volume Total	744	117	871	143	427
Volume Left	0	0	40	143	0
Volume Right	0	117	0	0	427
cSH	1700	1700	850	104	415
Volume to Capacity	0.44	0.07	0.05	1.38	1.03
Queue Length 95th (m)	0.0	0.0	1.2	81.2	107.6
Control Delay (s)	0.0	0.0	1.3	292.9	84.2
Lane LOS			A	F	F
Approach Delay (s)	0.0		1.3	136.6	
Approach LOS				F	

Intersection Summary			
Average Delay	34.3		
Intersection Capacity Utilization	86.6%	ICU Level of Service	E
Analysis Period (min)	15		

Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	157	928	69	68	689	197	29	114	198	123	82	93
Future Volume (vph)	157	928	69	68	689	197	29	114	198	123	82	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	180.0		0.0	185.0		0.0	157.0		0.0	150.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.990			0.967			0.905			0.920	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	1826	0	1733	1743	0	1623	1676	0	1785	1674	0
Flt Permitted	0.131			0.083			0.615			0.355		
Satd. Flow (perm)	244	1826	0	151	1743	0	1050	1676	0	667	1674	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8			32			104			68	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1121.3			305.8			269.5			271.6	
Travel Time (s)		80.7			22.0			19.4			19.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	2%	0%	3%	4%	5%	10%	4%	0%	0%	7%	0%
Adj. Flow (vph)	165	977	73	72	725	207	31	120	208	129	86	98
Shared Lane Traffic (%)												
Lane Group Flow (vph)	165	1050	0	72	932	0	31	328	0	129	184	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	24.0	24.0		24.0	24.0		26.0	26.0		26.0	26.0	
Total Split (s)	54.0	54.0		54.0	54.0		26.0	26.0		26.0	26.0	
Total Split (%)	67.5%	67.5%		67.5%	67.5%		32.5%	32.5%		32.5%	32.5%	
Maximum Green (s)	48.0	48.0		48.0	48.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	13.0	13.0		13.0	13.0		15.0	15.0		15.0	15.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	48.0	48.0		48.0	48.0		20.0	20.0		20.0	20.0	
Actuated g/C Ratio	0.60	0.60		0.60	0.60		0.25	0.25		0.25	0.25	

Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	1.13	0.96		0.80	0.88		0.12	0.66		0.78	0.39	
Control Delay	136.9	35.4		73.5	25.2		24.7	25.4		60.9	18.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	136.9	35.4		73.5	25.2		24.7	25.4		60.9	18.4	
LOS	F	D		E	C		C	C		E	B	
Approach Delay		49.2			28.7			25.4			35.9	
Approach LOS		D			C			C			D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Pretimed			
Maximum v/c Ratio: 1.13			
Intersection Signal Delay: 37.7		Intersection LOS: D	
Intersection Capacity Utilization 122.8%		ICU Level of Service H	
Analysis Period (min) 15			

Splits and Phases: 7: County Road 93 & County Road 22

Queues
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	165	1050	72	932	31	328	129	184
v/c Ratio	1.13	0.96	0.80	0.88	0.12	0.66	0.78	0.39
Control Delay	136.9	35.4	73.5	25.2	24.7	25.4	60.9	18.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	136.9	35.4	73.5	25.2	24.7	25.4	60.9	18.4
Queue Length 50th (m)	~31.0	141.7	8.0	111.1	3.8	31.7	19.2	15.0
Queue Length 95th (m)	#45.8	#243.5	#35.1	#205.6	10.8	60.2	#49.2	33.0
Internal Link Dist (m)		1097.3		281.8		245.5		247.6
Turn Bay Length (m)	180.0		185.0		157.0		150.0	
Base Capacity (vph)	146	1098	90	1058	262	497	166	469
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.13	0.96	0.80	0.88	0.12	0.66	0.78	0.39

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues
1: County Road 27 & County Road 22

11/15/2016

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	42	229	513	24	459	78	322	42
v/c Ratio	0.11	0.28	0.69	0.09	0.45	0.32	0.61	0.08
Control Delay	10.0	10.6	17.6	16.9	17.3	21.2	24.3	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.0	10.6	17.6	16.9	17.3	21.2	24.3	2.4
Queue Length 50th (m)	2.6	14.5	40.7	2.0	20.1	7.0	32.0	0.0
Queue Length 95th (m)	7.6	27.3	73.2	6.9	32.1	17.6	55.5	3.2
Internal Link Dist (m)		491.9	1514.1		185.3		281.4	
Turn Bay Length (m)	110.0			130.0		125.0		110.0
Base Capacity (vph)	395	822	745	264	1028	245	528	511
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.28	0.69	0.09	0.45	0.32	0.61	0.08

Intersection Summary

Lanes, Volumes, Timings
2: Gill Road & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	351	8	11	462	16	7	2	9	13	3	3
Future Volume (vph)	10	351	8	11	462	16	7	2	9	13	3	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (m)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	2.9	3.5	3.5	3.5	3.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.996			0.932			0.980	
Flt Protected		0.999			0.999			0.981			0.966	
Satd. Flow (prot)	0	1818	0	0	1785	0	0	1602	0	0	1707	0
Flt Permitted		0.999			0.999			0.981			0.966	
Satd. Flow (perm)	0	1818	0	0	1785	0	0	1602	0	0	1707	0
Link Speed (k/h)		80			80			60			50	
Link Distance (m)		1538.1			370.7			296.2			94.4	
Travel Time (s)		69.2			16.7			17.8			6.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	3%	5%	0%	5%	0%	0%	0%	0%	6%	0%	0%
Adj. Flow (vph)	11	369	8	12	486	17	7	2	9	14	3	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	388	0	0	515	0	0	18	0	0	20	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.11	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 40.2% ICU Level of Service A
Analysis Period (min) 15

HCM Unsignalized Intersection Capacity Analysis
2: Gill Road & County Road 22

11/15/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	351	8	11	462	16	7	2	9	13	3	3
Future Volume (Veh/h)	10	351	8	11	462	16	7	2	9	13	3	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	369	8	12	486	17	7	2	9	14	3	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	503			377			918	922	373	924	918	494
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	503			377			918	922	373	924	918	494
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	99			99			97	99	99	94	99	99
cM capacity (veh/h)	1072			1193			247	267	678	238	268	579

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	388	515	18	20
Volume Left	11	12	7	14
Volume Right	8	17	9	3
cSH	1072	1193	366	266
Volume to Capacity	0.01	0.01	0.05	0.08
Queue Length 95th (m)	0.2	0.2	1.2	1.9
Control Delay (s)	0.3	0.3	15.3	19.7
Lane LOS	A	A	C	C
Approach Delay (s)	0.3	0.3	15.3	19.7
Approach LOS			C	C

Intersection Summary					
Average Delay	1.0				
Intersection Capacity Utilization	40.2%	ICU Level of Service		A	
Analysis Period (min)	15				

Lanes, Volumes, Timings
3: Fox Farm Road & County Road 22/Country Road 22

11/15/2016

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	369	6	8	475	7	9
Future Volume (vph)	369	6	8	475	7	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.998				0.924	
Flt Protected				0.999	0.979	
Satd. Flow (prot)	1821	0	0	1803	1700	0
Flt Permitted				0.999	0.979	
Satd. Flow (perm)	1821	0	0	1803	1700	0
Link Speed (k/h)	80			50	80	
Link Distance (m)	153.6			1063.4	320.8	
Travel Time (s)	6.9			76.6	14.4	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	0%	12%	4%	0%	0%
Adj. Flow (vph)	388	6	8	500	7	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	394	0	0	508	16	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary				
Area Type:	Other			
Control Type: Unsignalized				
Intersection Capacity Utilization	41.4%		ICU Level of Service A	
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
3: Fox Farm Road & County Road 22/Country Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	369	6	8	475	7	9
Future Volume (Veh/h)	369	6	8	475	7	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	388	6	8	500	7	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			394		907	391
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			394		907	391
tC, single (s)			4.2		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			99		98	99
cM capacity (veh/h)			1112		306	662

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	394	508	16
Volume Left	0	8	7
Volume Right	6	0	9
cSH	1700	1112	439
Volume to Capacity	0.23	0.01	0.04
Queue Length 95th (m)	0.0	0.2	0.9
Control Delay (s)	0.0	0.2	13.5
Lane LOS		A	B
Approach Delay (s)	0.0	0.2	13.5
Approach LOS			B

Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization		41.4%	ICU Level of Service A
Analysis Period (min)		15	

Lanes, Volumes, Timings
4: Old Second Road

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	372	7	5	481	14	6	8	8	7	5	3
Future Volume (vph)	3	372	7	5	481	14	6	8	8	7	5	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.998			0.996			0.951			0.973	
Flt Protected								0.987			0.977	
Satd. Flow (prot)	0	1783	0	0	1799	0	0	1677	0	0	1634	0
Flt Permitted								0.987			0.977	
Satd. Flow (perm)	0	1783	0	0	1799	0	0	1677	0	0	1634	0
Link Speed (k/h)		50			50			80			80	
Link Distance (m)		1063.4			661.0			398.3			389.2	
Travel Time (s)		76.6			47.6			17.9			17.5	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	5%	16%	16%	4%	0%	7%	0%	9%	20%	0%	0%
Adj. Flow (vph)	3	392	7	5	506	15	6	8	8	7	5	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	402	0	0	526	0	0	22	0	0	15	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 39.4%		ICU Level of Service A	
Analysis Period (min) 15			

HCM Unsignalized Intersection Capacity Analysis
4: Old Second Road

11/15/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	372	7	5	481	14	6	8	8	7	5	3
Future Volume (Veh/h)	3	372	7	5	481	14	6	8	8	7	5	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	3	392	7	5	506	15	6	8	8	7	5	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	521			399			930	932	396	937	928	514
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	521			399			930	932	396	937	928	514
tC, single (s)	4.1			4.3			7.2	6.5	6.3	7.3	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.4	3.7	4.0	3.3
p0 queue free %	100			100			97	97	99	97	98	99
cM capacity (veh/h)	1056			1088			236	266	639	218	268	565

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	402	526	22	15
Volume Left	3	5	6	7
Volume Right	7	15	8	3
cSH	1056	1088	324	268
Volume to Capacity	0.00	0.00	0.07	0.06
Queue Length 95th (m)	0.1	0.1	1.7	1.4
Control Delay (s)	0.1	0.1	16.9	19.3
Lane LOS	A	A	C	C
Approach Delay (s)	0.1	0.1	16.9	19.3
Approach LOS			C	C

Intersection Summary				
Average Delay			0.8	
Intersection Capacity Utilization			39.4%	ICU Level of Service
Analysis Period (min)			15	

Lanes, Volumes, Timings
5: Country Road 22 & Highway 400 South Ramp

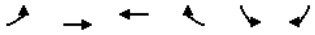
11/15/2016

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	92	295	403	187	5	102
Future Volume (vph)	92	295	403	187	5	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.850	0.871	
Flt Protected		0.988			0.998	
Satd. Flow (prot)	0	1773	1824	1581	1600	0
Flt Permitted		0.988			0.998	
Satd. Flow (perm)	0	1773	1824	1581	1600	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		661.0	382.0		499.1	
Travel Time (s)		47.6	27.5		35.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	7%	4%	3%	1%	25%	1%
Adj. Flow (vph)	97	311	424	197	5	107
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	408	424	197	112	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		0.0	0.0		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: Country Road 22 & Highway 400 South Ramp

11/15/2016



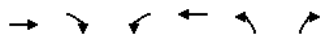
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	92	295	403	187	5	102
Future Volume (Veh/h)	92	295	403	187	5	102
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	97	311	424	197	5	107
Pedestrians						
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	424				929	424
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	424				929	424
tC, single (s)	4.2				6.6	6.2
tC, 2 stage (s)						
tF (s)	2.3				3.7	3.3
p0 queue free %	91				98	83
cM capacity (veh/h)	1109				247	632

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	408	424	197	112
Volume Left	97	0	0	5
Volume Right	0	0	197	107
cSH	1109	1700	1700	591
Volume to Capacity	0.09	0.25	0.12	0.19
Queue Length 95th (m)	2.3	0.0	0.0	5.5
Control Delay (s)	2.7	0.0	0.0	12.5
Lane LOS	A			B
Approach Delay (s)	2.7	0.0		12.5
Approach LOS				B

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		

Lanes, Volumes, Timings
6: Highway 400 North Ramp & County Road 22

11/15/2016



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	244	57	16	549	51	131
Future Volume (vph)	244	57	16	549	51	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected				0.999	0.950	
Satd. Flow (prot)	1824	1581	0	1804	1785	1566
Flt Permitted				0.999	0.950	
Satd. Flow (perm)	1824	1581	0	1804	1785	1566
Link Speed (k/h)	50			80	50	
Link Distance (m)	382.0			36.2	392.3	
Travel Time (s)	27.5			1.6	28.2	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	3%	1%	5%	4%	0%	2%
Adj. Flow (vph)	257	60	17	578	54	138
Shared Lane Traffic (%)						
Lane Group Flow (vph)	257	60	0	595	54	138
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.5	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
6: Highway 400 North Ramp & County Road 22

11/15/2016

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	244	57	16	549	51	131
Future Volume (Veh/h)	244	57	16	549	51	131
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	257	60	17	578	54	138
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			257		869	257
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			257		869	257
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		83	82
cM capacity (veh/h)			1290		321	782

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2
Volume Total	257	60	595	54	138
Volume Left	0	0	17	54	0
Volume Right	0	60	0	0	138
cSH	1700	1700	1290	321	782
Volume to Capacity	0.15	0.04	0.01	0.17	0.18
Queue Length 95th (m)	0.0	0.0	0.3	4.8	5.1
Control Delay (s)	0.0	0.0	0.4	18.5	10.6
Lane LOS			A	C	B
Approach Delay (s)	0.0		0.4	12.8	
Approach LOS				B	

Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	51.8%	ICU Level of Service		A
Analysis Period (min)	15			

Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	329	44	41	496	64	70	62	29	45	43	22
Future Volume (vph)	27	329	44	41	496	64	70	62	29	45	43	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	180.0		0.0	185.0		0.0	157.0		0.0	150.0		0.0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.982			0.983			0.952			0.949	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1767	1813	0	1733	1774	0	1623	1742	0	1785	1704	0
Flt Permitted	0.291			0.475			0.713			0.695		
Satd. Flow (perm)	541	1813	0	866	1774	0	1218	1742	0	1306	1704	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15			14			31			23	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		1121.3			305.8			269.5			271.6	
Travel Time (s)		80.7			22.0			19.4			19.6	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	2%	0%	3%	4%	5%	10%	4%	0%	0%	7%	0%
Adj. Flow (vph)	28	346	46	43	522	67	74	65	31	47	45	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	28	392	0	43	589	0	74	96	0	47	68	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.5			3.5			3.5			3.5	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	24.0	24.0		24.0	24.0		26.0	26.0		26.0	26.0	
Total Split (s)	34.0	34.0		34.0	34.0		26.0	26.0		26.0	26.0	
Total Split (%)	56.7%	56.7%		56.7%	56.7%		43.3%	43.3%		43.3%	43.3%	
Maximum Green (s)	28.0	28.0		28.0	28.0		20.0	20.0		20.0	20.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	13.0	13.0		13.0	13.0		15.0	15.0		15.0	15.0	
Flash Dont Walk (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	28.0	28.0		28.0	28.0		20.0	20.0		20.0	20.0	
Actuated g/C Ratio	0.47	0.47		0.47	0.47		0.33	0.33		0.33	0.33	

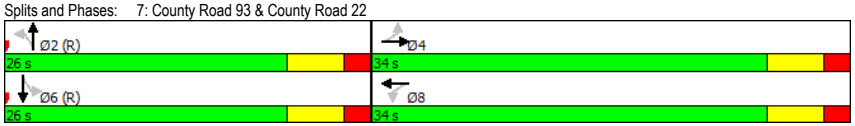
Lanes, Volumes, Timings
7: County Road 93 & County Road 22

11/15/2016

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.11	0.46		0.11	0.71		0.18	0.16		0.11	0.12	
Control Delay	10.5	12.6		9.9	18.1		15.7	11.2		14.7	10.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	10.5	12.6		9.9	18.1		15.7	11.2		14.7	10.8	
LOS	B	B		A	B		B	B		B	B	
Approach Delay		12.5			17.5			13.2			12.4	
Approach LOS		B			B			B			B	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 60			
Control Type: Pretimed			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 14.9		Intersection LOS: B	
Intersection Capacity Utilization 60.7%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 7: County Road 93 & County Road 22



Queues
7: County Road 93 & County Road 22

11/15/2016

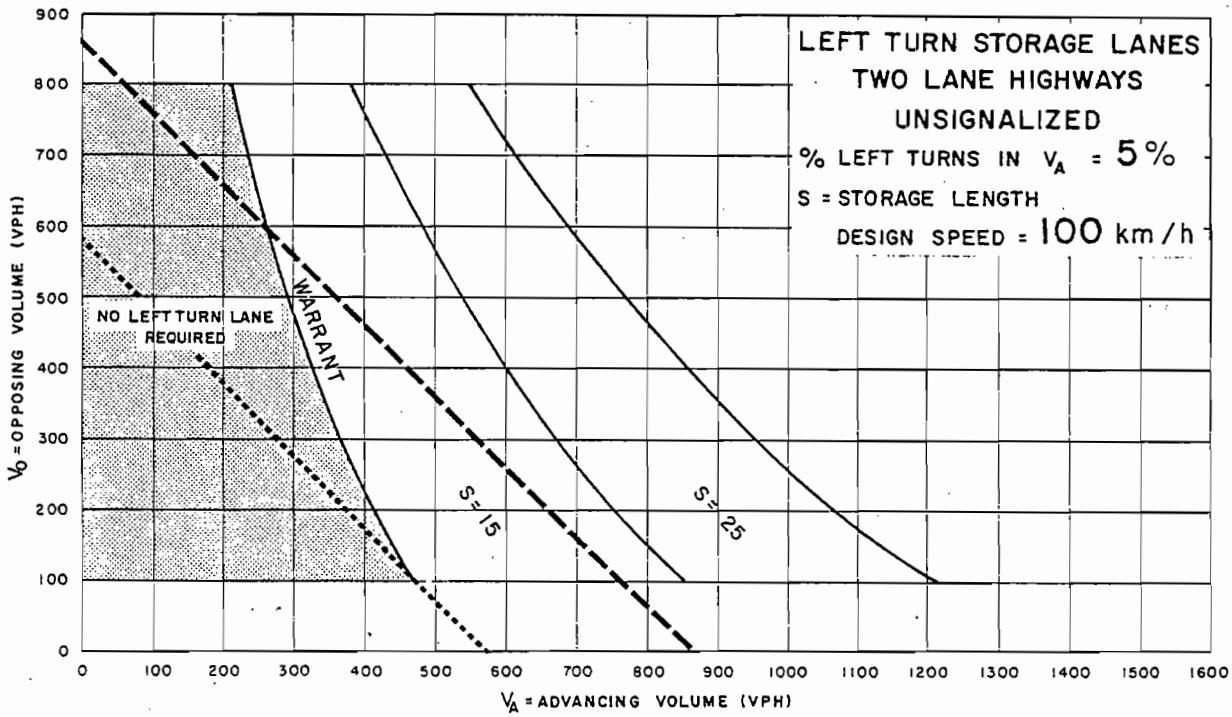
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	28	392	43	589	74	96	47	68
v/c Ratio	0.11	0.46	0.11	0.71	0.18	0.16	0.11	0.12
Control Delay	10.5	12.6	9.9	18.1	15.7	11.2	14.7	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.5	12.6	9.9	18.1	15.7	11.2	14.7	10.8
Queue Length 50th (m)	1.7	27.6	2.6	49.5	6.0	5.1	3.7	3.5
Queue Length 95th (m)	5.9	47.7	7.6	84.0	14.6	14.1	10.1	10.9
Internal Link Dist (m)		1097.3		281.8		245.5		247.6
Turn Bay Length (m)	180.0		185.0		157.0		150.0	
Base Capacity (vph)	252	854	404	835	406	601	435	583
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.46	0.11	0.71	0.18	0.16	0.11	0.12

Intersection Summary

APPENDIX H

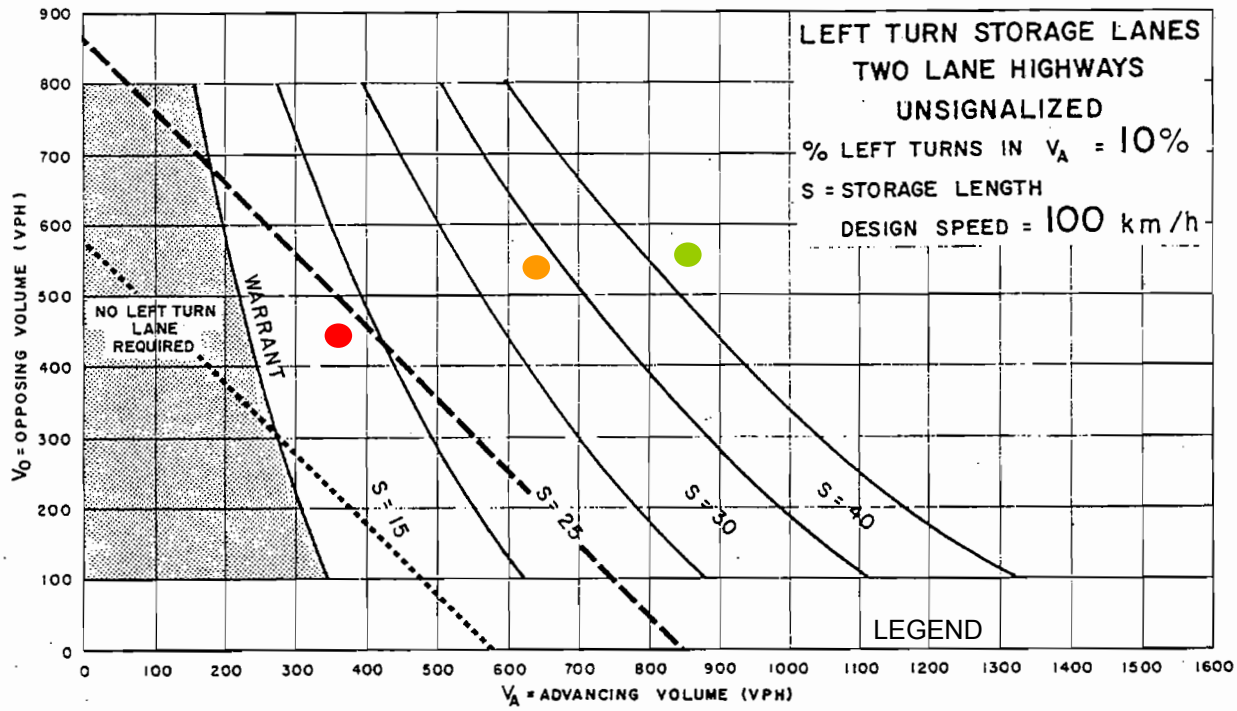
Left Turn Lane Warrant

MMM GROUP



TRAFFIC SIGNALS MAY BE WARRANTED IN RURAL AREAS OR URBAN AREAS WITH RESTRICTED FLOW

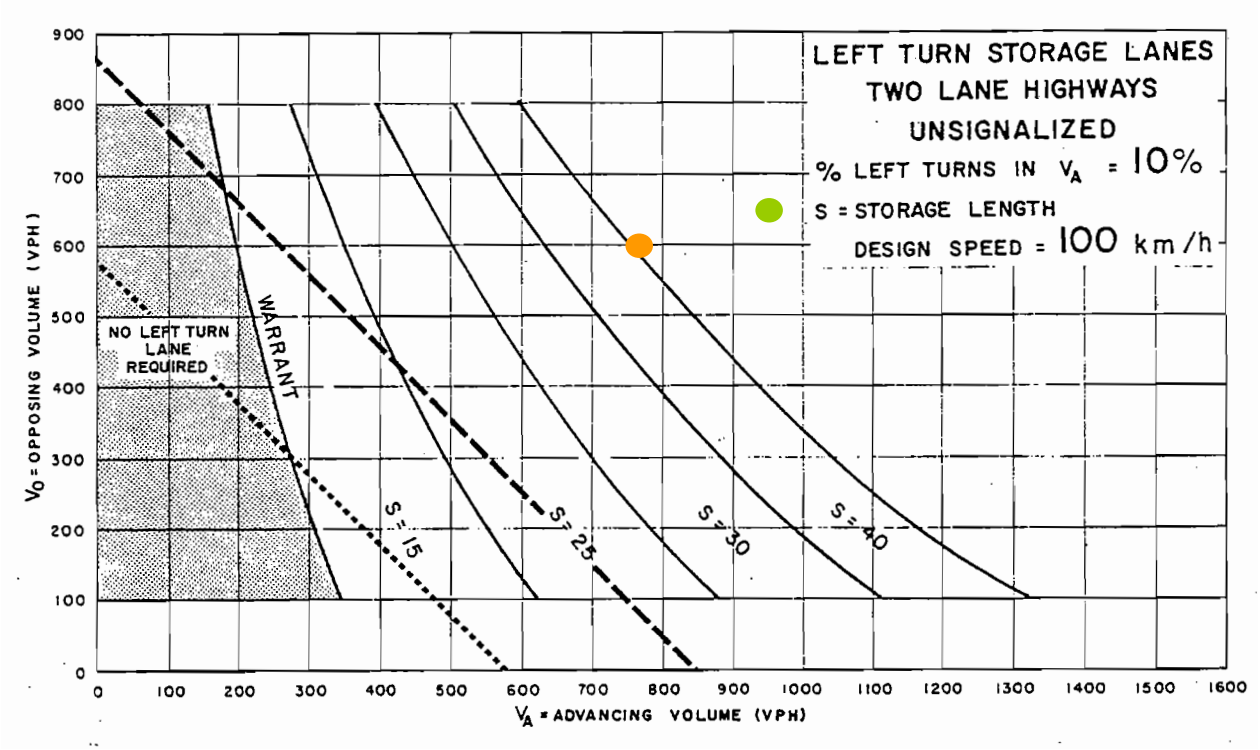
TRAFFIC SIGNALS MAY BE WARRANTED IN "FREE FLOW" URBAN AREAS



LEGEND

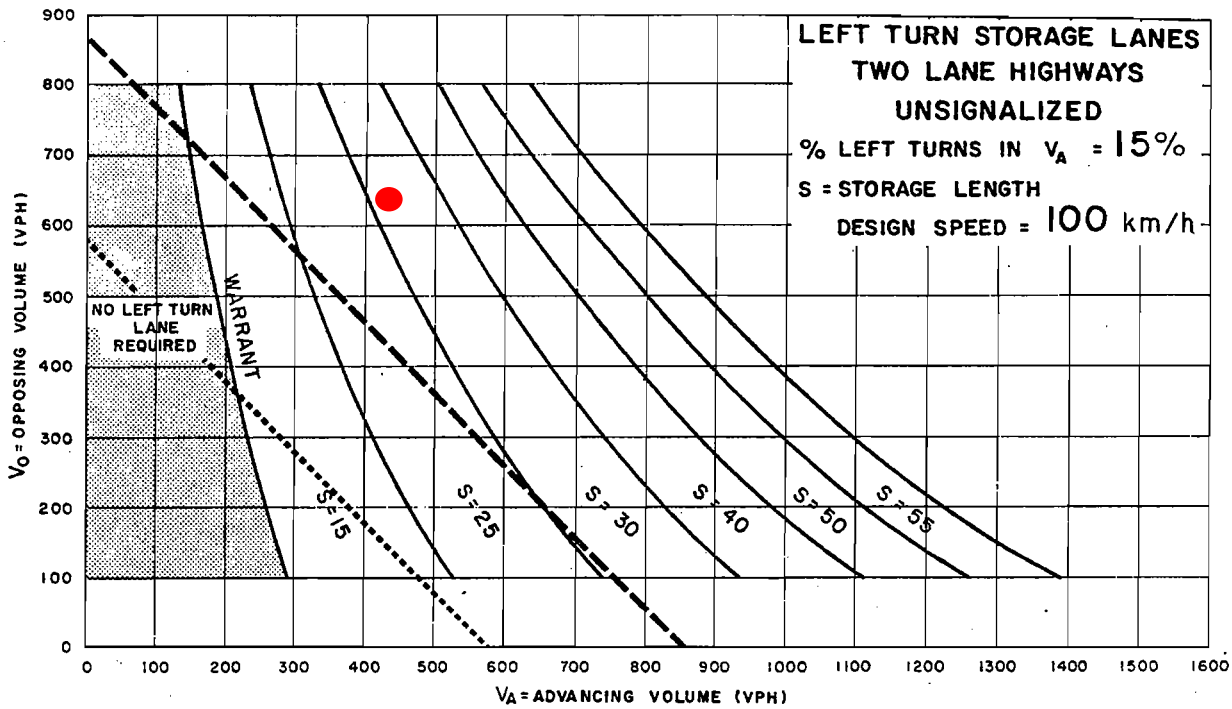
- Weekday AM
- Weekday PM
- Friday PM

Figure H-1
2021 Horizon



TRAFFIC SIGNALS MAY BE WARRANTED IN RURAL AREAS OR URBAN AREAS WITH RESTRICTED FLOW

TRAFFIC SIGNALS MAY BE WARRANTED IN "FREE FLOW" URBAN AREAS

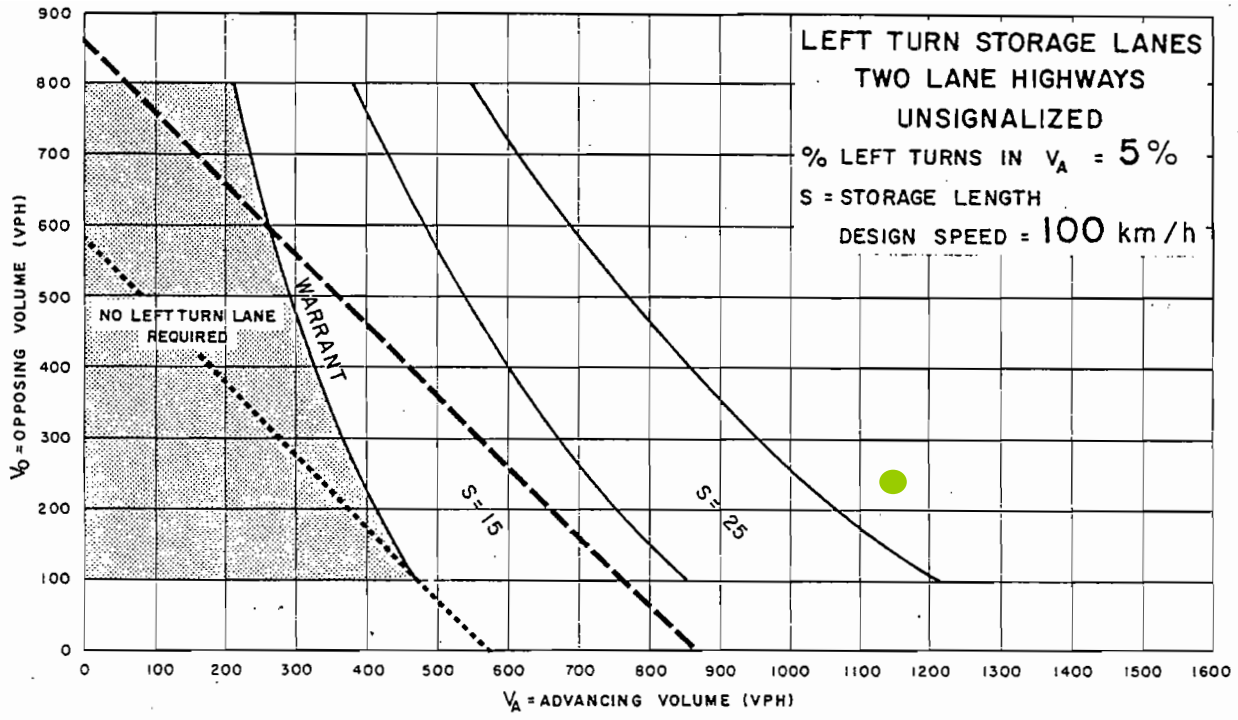


LEGEND

- Weekday AM
- Weekday PM
- Friday PM

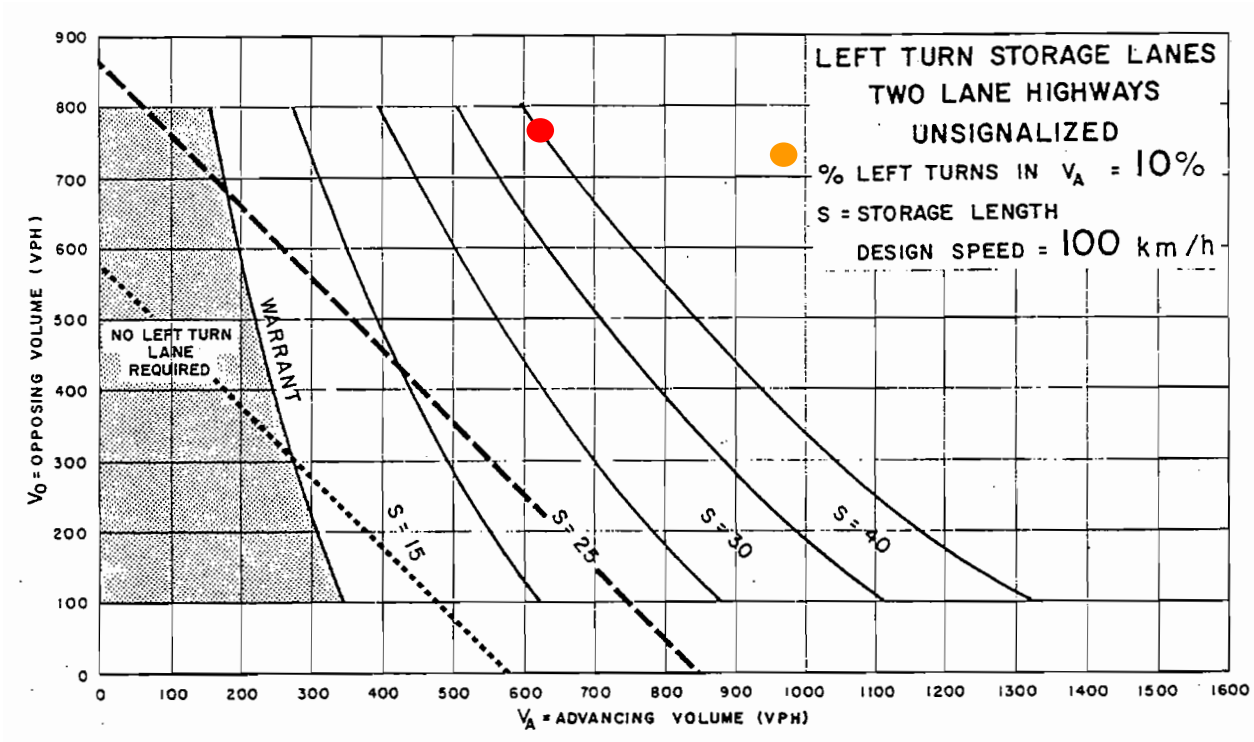
WSP | MMM GROUP

Figure H-2
2026 Horizon



TRAFFIC SIGNALS MAY BE WARRANTED IN RURAL AREAS OR URBAN AREAS WITH RESTRICTED FLOW

TRAFFIC SIGNALS MAY BE WARRANTED IN "FREE FLOW" URBAN AREAS



LEGEND

- Weekday AM
- Weekday PM
- Friday PM

WSP | MMM GROUP

Figure H-3
2031 Horizon

APPENDIX I

Right Turn Lane Warrant

Exhibit 6-1: Recommended Right-Turn Guideline

Arterial Function	Desired Operating Speeds (km/h)	Design Approach Volumes (vph)	Right-Turn Lane Threshold (vph)	Right-Turn Direct Taper Threshold (vph)
Type A	Urban or Rural (70-80 km/h)	800 to 1,000	50 (four-lane) 40 (two-lane)	10 (four-lane) All (two-lane)
Type B	Urban (60 km/h)	700	50 (four-lane) 40 (two-lane)	20 (four-lane) 20 (two-lane)
	Rural (80 km/h)	700	70 (four-lane) 40 (two-lane)	20 (four-lane) 20 (two-lane)
Type C	Urban (50-60 km/h)	500	50 (two-lane)	20 (two-lane)

- The recommended warrants are in the same warrant range of 60 right-turn vehicles per hour specified in the TAC manual, with lower threshold values for right-turn tapers and higher operating speeds;

- To address operational constraints at the intersection of higher-order roadways, it is recommended the channelized right-turns be incorporated into the design of intersections between Type A and Type B roadways, i.e., Type A-A, B-B and A-B intersections;

- It is recommended that the Region of Durham continue to apply the TAC design standards and incorporate them into the Region of Durham standards, with the following minor variations:

  – A typical lane width of 3.5 metres;

  – Taper length, when used with a parallel lane, should be generally consistent with average taper ratio outlined in TAC (See **Exhibit 6-2**). Straight-line tapers are recommended to better define the transition areas;

  – Minimum parallel lengths consistent with the deceleration distance requirements generally specified by TAC (See **Exhibit 6-2**);

Exhibit 6-2: Guideline for Taper with Parallel Lane Design

Design Speed (km/h)	Taper Lengths	Minimum Parallel Length [1, 2]
50	50	35
60	55	40
70	65	50
80	70	60
Note 1: Additional parallel length may be required for vehicle storage or site-specific requirements Note 2: Minimum parallel length must be factored for grades greater than or less than 2% (Refer to adjustment factors in **Exhibit 6-3**)		

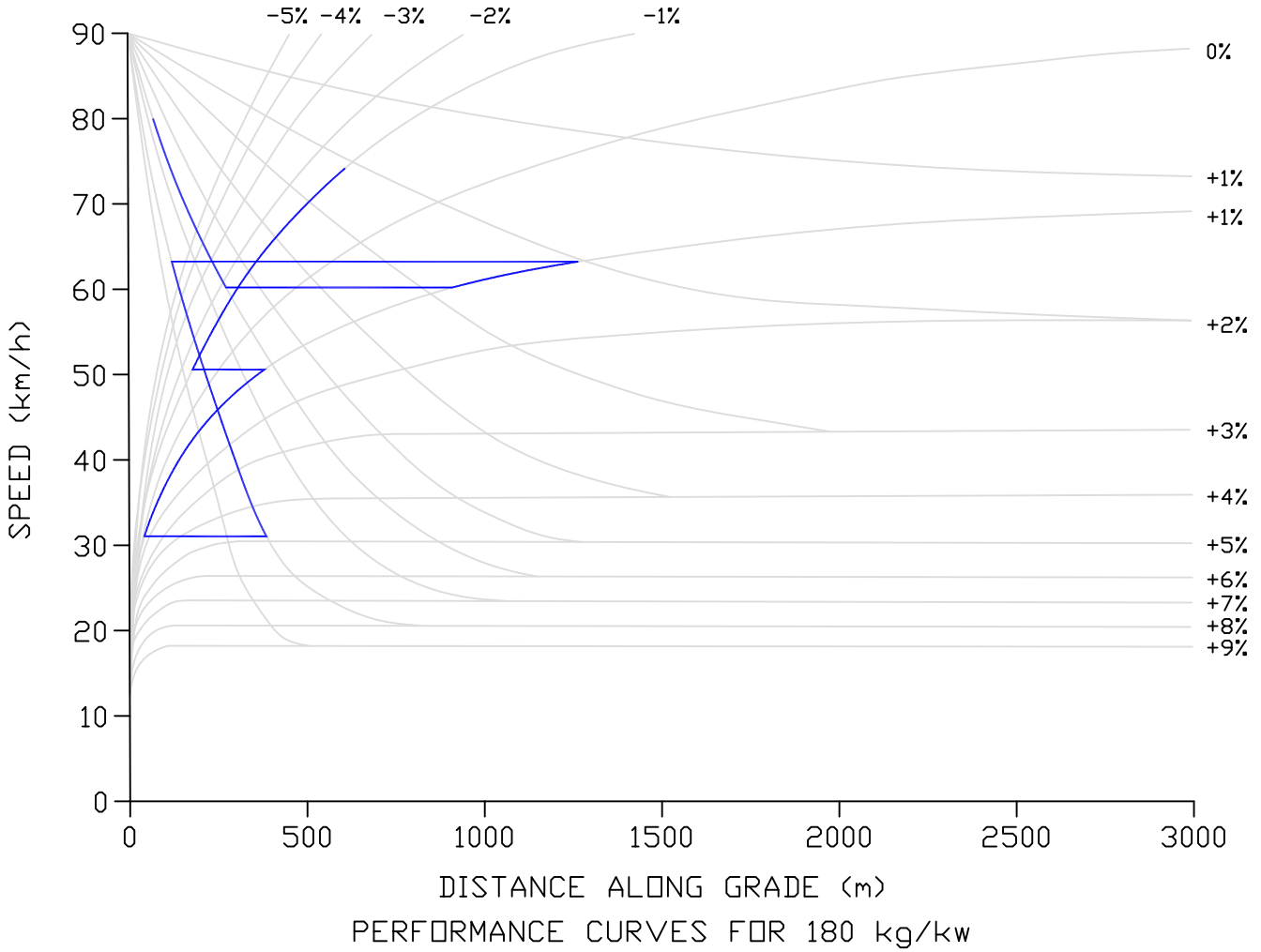
  – A minimum right-turn channel island size of 20 m^2.

APPENDIX J

Truck Climbing Lane Warrant

MMM GROUP

Horseshoe Valley Road (CR22) - Truck Climbing Lane Calculation

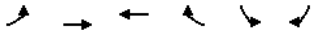


Station (feet)	Distance (feet)	Distance (m)	Grade (%)	Speed (km/h)
32155				80*
31480	675	206	5.98	60
30316	1164	355	0.57	63
29440	876	267	8.02	31
28330	1110	338	1.27	51
26920	1410	430	-0.87	74
*Assumed starting speed of 80 km/h at station 321+55				

APPENDIX K

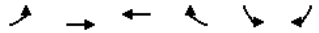
Total Future Intersection Capacity Analysis
Unsignalized Access

MMM GROUP



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	20	353	480	2	25	0
Future Volume (vph)	20	353	480	2	25	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			15.0	0.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				0.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.999			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	892	1824	1798	0	1056	1112
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	892	1824	1798	0	1056	1112
Link Speed (k/h)		80	80		50	
Link Distance (m)		370.7	855.3		443.0	
Travel Time (s)		16.7	38.5		31.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	100%	3%	4%	100%	69%	69%
Adj. Flow (vph)	21	372	505	2	26	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	21	372	507	0	26	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.5	3.5		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

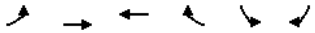
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	35.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	353	480	2	25	0
Future Volume (Veh/h)	20	353	480	2	25	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	372	505	2	26	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	507				920	506
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	507				920	506
tC, single (s)	5.1				7.1	6.9
tC, 2 stage (s)						
tF (s)	3.1				4.1	3.9
p0 queue free %	97				88	100
cM capacity (veh/h)	699				224	453

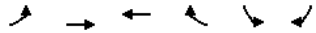
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	21	372	507	26	0
Volume Left	21	0	0	26	0
Volume Right	0	0	2	0	0
cSH	699	1700	1700	224	1700
Volume to Capacity	0.03	0.22	0.30	0.12	0.00
Queue Length 95th (m)	0.7	0.0	0.0	3.1	0.0
Control Delay (s)	10.3	0.0	0.0	23.2	0.0
Lane LOS	B			C	A
Approach Delay (s)	0.6		0.0	23.2	
Approach LOS				C	

Intersection Summary				
Average Delay	0.9			
Intersection Capacity Utilization	35.4%	ICU Level of Service		A
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	43	783	569	3	59	6
Future Volume (vph)	43	783	569	3	59	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			15.0	0.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				0.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.999			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	892	1824	1797	0	1056	945
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	892	1824	1797	0	1056	945
Link Speed (k/h)		80	80		50	
Link Distance (m)		370.7	855.3		443.0	
Travel Time (s)		16.7	38.5		31.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	100%	3%	4%	100%	69%	69%
Adj. Flow (vph)	45	824	599	3	62	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	45	824	602	0	62	6
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.5	3.5		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

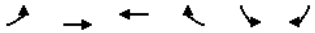
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	51.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	43	783	569	3	59	6
Future Volume (Veh/h)	43	783	569	3	59	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	45	824	599	3	62	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	602				1514	600
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	602				1514	600
tC, single (s)	5.1				7.1	6.9
tC, 2 stage (s)						
tF (s)	3.1				4.1	3.9
p0 queue free %	93				28	98
cM capacity (veh/h)	634				87	396

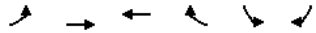
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	45	824	602	62	6
Volume Left	45	0	0	62	0
Volume Right	0	0	3	0	6
cSH	634	1700	1700	87	396
Volume to Capacity	0.07	0.48	0.35	0.72	0.02
Queue Length 95th (m)	1.8	0.0	0.0	28.2	0.4
Control Delay (s)	11.1	0.0	0.0	115.0	14.2
Lane LOS	B			F	B
Approach Delay (s)	0.6		0.0	106.1	
Approach LOS				F	

Intersection Summary				
Average Delay	5.0			
Intersection Capacity Utilization	51.2%	ICU Level of Service		A
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	43	613	525	3	59	6
Future Volume (vph)	43	613	525	3	59	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			15.0	0.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				0.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.999			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	892	1824	1796	0	1056	945
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	892	1824	1796	0	1056	945
Link Speed (k/h)		80	80		50	
Link Distance (m)		370.7	855.3		443.0	
Travel Time (s)		16.7	38.5		31.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	100%	3%	4%	100%	69%	69%
Adj. Flow (vph)	45	645	553	3	62	6
Shared Lane Traffic (%)						
Lane Group Flow (vph)	45	645	556	0	62	6
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.5	3.5		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

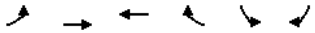
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	44.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	43	613	525	3	59	6
Future Volume (Veh/h)	43	613	525	3	59	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	45	645	553	3	62	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	556				1290	554
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	556				1290	554
tC, single (s)	5.1				7.1	6.9
tC, 2 stage (s)						
tF (s)	3.1				4.1	3.9
p0 queue free %	93				50	99
cM capacity (veh/h)	665				123	423

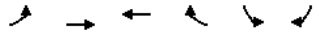
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	45	645	556	62	6
Volume Left	45	0	0	62	0
Volume Right	0	0	3	0	6
cSH	665	1700	1700	123	423
Volume to Capacity	0.07	0.38	0.33	0.50	0.01
Queue Length 95th (m)	1.7	0.0	0.0	18.7	0.3
Control Delay (s)	10.8	0.0	0.0	60.9	13.6
Lane LOS	B			F	B
Approach Delay (s)	0.7		0.0	56.7	
Approach LOS				F	

Intersection Summary				
Average Delay	3.3			
Intersection Capacity Utilization	44.5%	ICU Level of Service		A
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	47	390	608	3	41	0
Future Volume (vph)	47	390	608	3	41	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			15.0	0.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				0.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.999			
Flt Protected	0.950				0.950	
Satd. Flow (prot)	892	1824	1797	0	1044	1099
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	892	1824	1797	0	1044	1099
Link Speed (k/h)		80	80		50	
Link Distance (m)		370.7	855.3		443.0	
Travel Time (s)		16.7	38.5		31.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	100%	3%	4%	100%	71%	71%
Adj. Flow (vph)	49	411	640	3	43	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	49	411	643	0	43	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.5	3.5		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	48.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	47	390	608	3	41	0
Future Volume (Veh/h)	47	390	608	3	41	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	49	411	640	3	43	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	643				1150	642
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	643				1150	642
tC, single (s)	5.1				7.1	6.9
tC, 2 stage (s)						
tF (s)	3.1				4.1	3.9
p0 queue free %	92				71	100
cM capacity (veh/h)	608				149	371

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	49	411	643	43	0
Volume Left	49	0	0	43	0
Volume Right	0	0	3	0	0
cSH	608	1700	1700	149	1700
Volume to Capacity	0.08	0.24	0.38	0.29	0.00
Queue Length 95th (m)	2.1	0.0	0.0	9.0	0.0
Control Delay (s)	11.4	0.0	0.0	38.8	0.0
Lane LOS	B			E	A
Approach Delay (s)	1.2		0.0	38.8	
Approach LOS				E	

Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	48.8%	ICU Level of Service		A
Analysis Period (min)	15			

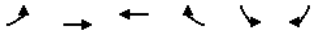
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	58	897	642	4	85	8
Future Volume (vph)	58	897	642	4	85	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			15.0	0.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				0.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.999			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	892	1824	1795	0	1044	934
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	892	1824	1795	0	1044	934
Link Speed (k/h)		80	80		50	
Link Distance (m)		370.7	855.3		443.0	
Travel Time (s)		16.7	38.5		31.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	100%	3%	4%	100%	71%	71%
Adj. Flow (vph)	61	944	676	4	89	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	61	944	680	0	89	8
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.5	3.5		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	58	897	642	4	85	8
Future Volume (Veh/h)	58	897	642	4	85	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	61	944	676	4	89	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	680				1744	678
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	680				1744	678
tC, single (s)	5.1				7.1	6.9
tC, 2 stage (s)						
tF (s)	3.1				4.1	3.9
p0 queue free %	90				0	98
cM capacity (veh/h)	586				58	352

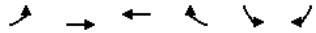
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	61	944	680	89	8
Volume Left	61	0	0	89	0
Volume Right	0	0	4	0	8
cSH	586	1700	1700	58	352
Volume to Capacity	0.10	0.56	0.40	1.54	0.02
Queue Length 95th (m)	2.8	0.0	0.0	64.5	0.6
Control Delay (s)	11.9	0.0	0.0	431.6	15.5
Lane LOS	B			F	C
Approach Delay (s)	0.7		0.0	397.2	
Approach LOS				F	

Intersection Summary				
Average Delay	22.0			
Intersection Capacity Utilization	58.6%	ICU Level of Service	B	
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	58	719	596	4	85	8
Future Volume (vph)	58	719	596	4	85	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			15.0	0.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				0.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.999			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	892	1824	1794	0	1044	934
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	892	1824	1794	0	1044	934
Link Speed (k/h)		80	80		50	
Link Distance (m)		370.7	855.3		443.0	
Travel Time (s)		16.7	38.5		31.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	100%	3%	4%	100%	71%	71%
Adj. Flow (vph)	61	757	627	4	89	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	61	757	631	0	89	8
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.5	3.5		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

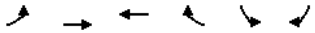
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	58	719	596	4	85	8
Future Volume (Veh/h)	58	719	596	4	85	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	61	757	627	4	89	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	631				1508	629
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	631				1508	629
tC, single (s)	5.1				7.1	6.9
tC, 2 stage (s)						
tF (s)	3.1				4.1	3.9
p0 queue free %	90				0	98
cM capacity (veh/h)	616				84	378

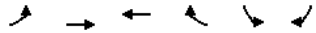
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	61	757	631	89	8
Volume Left	61	0	0	89	0
Volume Right	0	0	4	0	8
cSH	616	1700	1700	84	378
Volume to Capacity	0.10	0.45	0.37	1.06	0.02
Queue Length 95th (m)	2.6	0.0	0.0	48.8	0.5
Control Delay (s)	11.5	0.0	0.0	205.1	14.7
Lane LOS	B			F	B
Approach Delay (s)	0.9		0.0	189.4	
Approach LOS				F	

Intersection Summary			
Average Delay	12.3		
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	47	459	782	3	41	0
Future Volume (vph)	47	459	782	3	41	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			15.0	0.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt						
Flt Protected	0.950				0.950	
Satd. Flow (prot)	892	1678	1767	0	1044	1099
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	892	1678	1767	0	1044	1099
Link Speed (k/h)		80	80		50	
Link Distance (m)		370.7	855.3		443.0	
Travel Time (s)		16.7	38.5		31.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	100%	12%	6%	100%	71%	71%
Adj. Flow (vph)	49	483	823	3	43	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	49	483	826	0	43	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.5	3.5		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

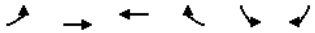
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	51.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	47	459	782	3	41	0
Future Volume (Veh/h)	47	459	782	3	41	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	49	483	823	3	43	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	826				1406	824
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	826				1406	824
tC, single (s)	5.1				7.1	6.9
tC, 2 stage (s)						
tF (s)	3.1				4.1	3.9
p0 queue free %	90				56	100
cM capacity (veh/h)	504				99	285

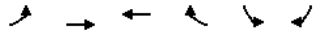
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	49	483	826	43	0
Volume Left	49	0	0	43	0
Volume Right	0	0	3	0	0
cSH	504	1700	1700	99	1700
Volume to Capacity	0.10	0.28	0.49	0.44	0.00
Queue Length 95th (m)	2.6	0.0	0.0	14.7	0.0
Control Delay (s)	12.9	0.0	0.0	67.1	0.0
Lane LOS	B			F	A
Approach Delay (s)	1.2		0.0	67.1	
Approach LOS				F	

Intersection Summary				
Average Delay	2.5			
Intersection Capacity Utilization	51.3%	ICU Level of Service		A
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	58	1120	769	4	85	8
Future Volume (vph)	58	1120	769	4	85	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			15.0	0.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.999			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	892	1824	1797	0	1044	934
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	892	1824	1797	0	1044	934
Link Speed (k/h)		80	80		50	
Link Distance (m)		370.7	855.3		443.0	
Travel Time (s)		16.7	38.5		31.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	100%	3%	4%	100%	71%	71%
Adj. Flow (vph)	61	1179	809	4	89	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	61	1179	813	0	89	8
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.5	3.5		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

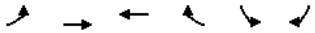
Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	58	1120	769	4	85	8
Future Volume (Veh/h)	58	1120	769	4	85	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	61	1179	809	4	89	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	813				2112	811
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	813				2112	811
tC, single (s)	5.1				7.1	6.9
tC, 2 stage (s)						
tF (s)	3.1				4.1	3.9
p0 queue free %	88				0	97
cM capacity (veh/h)	510				31	291

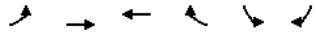
Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	61	1179	813	89	8
Volume Left	61	0	0	89	0
Volume Right	0	0	4	0	8
cSH	510	1700	1700	31	291
Volume to Capacity	0.12	0.69	0.48	2.83	0.03
Queue Length 95th (m)	3.2	0.0	0.0	83.2	0.7
Control Delay (s)	13.0	0.0	0.0	1091.4	17.7
Lane LOS	B			F	C
Approach Delay (s)	0.6		0.0	1002.9	
Approach LOS				F	

Intersection Summary				
Average Delay	45.6			
Intersection Capacity Utilization	70.3%	ICU Level of Service	C	
Analysis Period (min)	15			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	58	934	721	4	85	8
Future Volume (vph)	58	934	721	4	85	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	15.0			15.0	0.0	0.0
Storage Lanes	1			0	1	1
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.999			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	892	1824	1796	0	1044	934
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	892	1824	1796	0	1044	934
Link Speed (k/h)		80	80		50	
Link Distance (m)		370.7	855.3		443.0	
Travel Time (s)		16.7	38.5		31.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	100%	3%	4%	100%	71%	71%
Adj. Flow (vph)	61	983	759	4	89	8
Shared Lane Traffic (%)						
Lane Group Flow (vph)	61	983	763	0	89	8
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(m)		3.5	3.5		3.5	
Link Offset(m)		0.0	0.0		0.0	
Crosswalk Width(m)		4.8	4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.01	1.01	1.01	1.01	1.01	1.01
Turning Speed (k/h)	25			15	25	15
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	58	934	721	4	85	8
Future Volume (Veh/h)	58	934	721	4	85	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	61	983	759	4	89	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	763				1866	761
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	763				1866	761
tC, single (s)	5.1				7.1	6.9
tC, 2 stage (s)						
tF (s)	3.1				4.1	3.9
p0 queue free %	89				0	97
cM capacity (veh/h)	538				47	313

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	61	983	763	89	8
Volume Left	61	0	0	89	0
Volume Right	0	0	4	0	8
cSH	538	1700	1700	47	313
Volume to Capacity	0.11	0.58	0.45	1.89	0.03
Queue Length 95th (m)	3.1	0.0	0.0	71.8	0.6
Control Delay (s)	12.6	0.0	0.0	607.7	16.8
Lane LOS	B			F	C
Approach Delay (s)	0.7		0.0	559.0	
Approach LOS				F	

Intersection Summary				
Average Delay	28.9			
Intersection Capacity Utilization	60.5%	ICU Level of Service	B	
Analysis Period (min)	15			

APPENDIX L

Signal Warrant

MMM GROUP

PROJECTED TRAFFIC SIGNAL WARRANT ANALYSIS FORM FOR INTERSECTION CONTROL

Minimum warrants for installation of traffic signal for roadways with two or more lanes per **OTM Book 12 Sec 4.10**

*NOTES: Does not consider pedestrian crossing volumes, which need to be added where appropriate and available
Only Projected Warrants can be conducted with Peak Hour counts; remaining warrants require 8 hours

Major Street: East-West
Minor Street: North-South
Comments:

Analyst: FY
Date: 16-Nov-16
Project No.: (PROJECT NUMBER)

FREE FLOW OR RESTRICTED CONDITIONS (FF or RES): RES
FREE FLOW CONDITIONS (RURAL)
RESTRICTED FLOW CONDITIONS (URBAN)

Major Street Approach Lanes: 1
Three or four legged intersection (3 or 4) 3
Future Condition (YES or NO): YES Locked for Projected Signal Warrant Analysis
New Intersection (YES or NO): YES Locked for Projected Signal Warrant Analysis
Intersection ID 8
Source Data Table AM TF_2031_AM
Source Data Table PM TF_2031_PM_Friday

WARRANT 1

ALL APPROACHES

	PERCENTAGE WARRANT								TOTAL
HOUR ENDING	AM PEAK	PM PEAK							
Volumes	666	1022							
Minimum: 1080									
100% FULFILLED	0	0	0	0	0	0	0	0	0
Minimum: 863									
80% FULFILLED	0	1	0	0	0	0	0	0	0.8
Actual if Below 80% Value	0.62		-	-	-	-	-	-	0.62
									1.42
								Sectional Percentage	**71%**

MINOR STREET BOTH APPROACHES

	PERCENTAGE WARRANT								TOTAL
HOUR ENDING	AM PEAK	PM PEAK							
Volumes	20.5	46.5							
Minimum: 383									
100% FULFILLED	0	0	0	0	0	0	0	0	0
Minimum: 304									
80% FULFILLED	0	0	0	0	0	0	0	0	0
Actual if Below 80% Value	0.05	0.12	-	-	-	-	-	-	0.18
									0.18
								Sectional Percentage	**9%**
								Entire Warrant 1 Percentage	**9%**

WARRANT 2

MAJOR STREET BOTH APPROACHES

	PERCENTAGE WARRANT								TOTAL
HOUR ENDING	AM PEAK	PM PEAK							
Volumes	645.5	975.5							
Minimum: 1080									
100% FULFILLED	0	0	0	0	0	0	0	0	0
Minimum: 863									
80% FULFILLED	0	1	0	0	0	0	0	0	0.8
Actual if Below 80% Value	0.60		-	-	-	-	-	-	0.60
									1.40
								Sectional Percentage	**70%**

TRAFFIC CROSSING MAJOR STREET

	PERCENTAGE WARRANT								TOTAL
HOUR ENDING	AM PEAK	PM PEAK							
Volumes	41	85							
Minimum: 113									
100% FULFILLED	0	0	0	0	0	0	0	0	0
Minimum: 90									
80% FULFILLED	0	0	0	0	0	0	0	0	0
Actual if Below 80% Value	0.36	0.76	-	-	-	-	-	-	1.12
									1.12
								Sectional Percentage	**56%**
								Entire Warrant 2 Percentage	**56%**

ARE SIGNALS WARRANTED AT THIS INTERSECTION?: NO