

# **Meaford A2A Developments Inc.**

Transportation Study

**Meaford Highlands Resort**  
**Municipality of Meaford**

**Project No. L10-512**

May 2012



May 28, 2012  
Our Ref: L10-512

Meaford A2A Developments Inc.  
250 Ferrand Drive, Suite 888,  
Toronto, ON M3C 3E5

**Attention: Mr. Steve Warsh**

Dear Mr. Warsh:

**Re: Transportation Study  
Meaford Highlands Resort - Lot 9 and Lot 10, 3rd Line  
Municipality of Meaford**

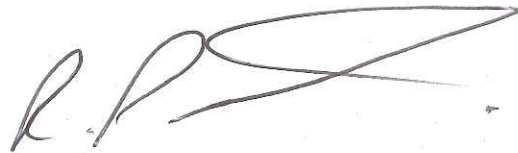
Cole Engineering Group Ltd. (Cole Engineering) is pleased to submit our Transportation Study for the above noted development. The report documents our findings and conclusions regarding the traffic impact requirements for the proposed residential / resort development, located on the southeast quadrant of 3<sup>rd</sup> Line and Highway 26 in the Municipality of Meaford, County of Grey (County).

The study concludes that all the key intersections and access driveways operate at acceptable levels of service during all analyzed peak periods with the implementation of the mitigating measures as recommended.

If you have any questions regarding this study, please do not hesitate to contact the undersigned.

Yours truly,

**COLE ENGINEERING GROUP LTD.**



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## Executive Summary

### Project Overview

The proposed development is located at the southeast quadrant of Highway 26 and 3rd Line in the Municipality of Meaford and is currently vacant. The proposed development will consist of Permanent Residential Dwellings, Seasonal Residential Dwellings, a Golf Course, a Resort Hotel, a Retail Area, and Aquatics and Wellness Center / Fitness Centre, assessed in three (3) phases of development over the course of five (5) horizon years. There will be three (3) full movement accesses servicing the proposed development via 3<sup>rd</sup> Line at “full build-out”. The study area is bounded by Highway 26 to the north and east, 3<sup>rd</sup> Line to the west and Sideroad 7 to the south. All the study intersections are currently unsignalized with the exception of Highway 26-Skyes Drive-McKibbin Drive and St. Vincent-County Road 7. **Table 1** summarizes the development phase and its build-out.

**Table 1 – Development Phasing**

Land Use	Phase 1 (2017)	Phase 2 (2022)	Phase 3 (2028)	Total
Permanent Low-Density Residential	42 units	60 units	68 units	170 units
Permanent Residential Townhouse	11 units	16 units	17 units	44 units
Seasonal Residential	184 units	314 units	365 units	863 units
Resort Hotel	60 units	-	-	60 units
Wellness Center/Spa/ Aquatics and Fitness Centre	32,000 ft <sup>2</sup>	-	-	32,000 ft <sup>2</sup>
Retail (Ancillary)	20,000 ft <sup>2</sup>	-	-	20,000 ft <sup>2</sup>
Golf Course	9 holes	-	-	9 holes

### Approach

The overall goal of this project was to determine the impact that the proposed development would have on the boundary road network. Based on the analysis, the current traffic conditions are generally acceptable. An annual growth rate of 2% was applied to the through movements along Highway 26 and along County Road 7 to reflect traffic growth from outside the study area. Three (3) horizons were analyzed to reflect the partial and full-build-out of the development. Based on the Ministry of Transportation of Ontario (MTO) guidelines, traffic analysis must be undertaken for every major phase of development and five (5) and ten (10) years post occupancy.

### Key Findings

The key findings of the traffic analysis were:

- The site traffic volumes generated in 2017 will have minimal impact to the study area intersections with the exception of Highway 26 and 3<sup>rd</sup> Line.
- The intersection of Sideroad 10-Site Access 1 and 3<sup>rd</sup> Line and Site Access 2 and 3<sup>rd</sup> Line will require exclusive southbound left turn lanes into the site in the 2028 horizon period.

- Based on the expected new vehicular trips to the development, it is recommended that 3<sup>rd</sup> Line be paved from Highway 26 to Sideroad 7 as well as Sideroad 7 from 3<sup>rd</sup> Line to County Road 7 at completion of the First Phase of Development i.e., 2017.
- During the future (2017) total traffic condition, the signalized intersection is expected to function with acceptable levels of service during the peak hour periods with no individual movements exceeding capacity.
- During the future (2022) total traffic condition, the signalized intersection of Highway 26-Skyes Drive-McKibbin and St. Vincent Street-County Road 7 is expected to operate with acceptable levels of service during the peak hour periods with no individual movements exceeding capacity.
- For the future (2028) total traffic condition, the intersection of Highway 26 and 3<sup>rd</sup> Line is warranted to operate as a signal control intersection.
- Similarly, during the future (2028) total traffic condition, all signalized intersections are expected to operate with acceptable levels of service during the peak hour periods with no individual movements exceeding capacity.
- For the future (2033) and (2038) total traffic condition, all signalized intersections are expected to operate with acceptable levels of service during the peak hour periods with no individual movements exceeding capacity.
- All the unsignalized intersections in the 2017, 2022, 2028, 2033 and 2038 horizons are expected to operate at acceptable levels of services with no individual movements operating above capacity.



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## 1.0 Introduction

Cole Engineering Group Ltd. (Cole Engineering) was retained by Meaford A2A Developments Inc. ("the Owner") to undertake a Transportation Study in support of an Official Plan Amendment (OPA) to "the County of Grey and Meaford Official Plan", and a Rezoning Application for a proposed residential / resort development. The subject lands are approximately 153.9 ha (380 acres) in size and are bounded by Highway 26 to the north and east, 3<sup>rd</sup> Line to the west and Sideroad 7 to the south in the Municipality of Meaford, County of Grey (County).

### 1.1. Proposed Development

The proposed development will consist of both residential and resort uses. Based on the *Meaford Highlands Resort Market Demand Analysis Report undertaken by Watson & Associates Economist Ltd*, "Table 5-2 Absorption Forecast – High Growth Scenario" was reviewed and the estimated units / gross floor area for the different land uses in the proposed development was obtained. The land uses and development plans are conceptual and may be subject to change; however, the overall approximate utilized land uses for assessment purposes are as follows:

- Permanent Residential = 214 units;
- Seasonal Residential = 863 units;
- Golf Course = 9 holes;
- Resort Hotel = 60 rooms;
- Retail = 20,000 ft<sup>2</sup> (Ancillary); and,
- Aquatics and Fitness Centre = 32,000 ft<sup>2</sup>.

Please note that for the purpose of this assessment, it is assumed that the development will be constructed in three (3) phases. **Table 1.1** summarizes the proposed build-out in their respective phase and horizon year.

**Table 1.1 – Development Phasing**

Land Use	Phase 1 (2017)	Phase 2 (2022)	Phase 3 (2028)	Total
Permanent Low-Density Residential	42 units	60 units	68 units	170 units
Permanent Residential Townhouse	11 units	16 units	17 units	44 units
Seasonal Residential	184 units	314 units	365 units	863 units
Resort Hotel	60 units	-	-	60 units
Aquatics and Fitness Centre	32,000 ft <sup>2</sup>	-	-	32,000 ft <sup>2</sup>
Retail (Ancillary)	20,000 ft <sup>2</sup>	-	-	20,000 ft <sup>2</sup>
Golf Course	9 holes	-	-	9 holes

The subject lands are currently vacant and the general site location is illustrated in **Figure 1-1** while the site concept plan and a conceptual phasing plan for the development is illustrated in **Figure 1-2** and **Figure 1-3**, respectively.

The purpose of this transportation study includes:

- Assessment of the existing traffic volumes and background growth within the study area;
- Assessment of the future traffic volumes based on five-year (2017), ten-year horizon (2022), 16-year horizon (2028), 20-year horizon (2033) periods and 25-year horizon (2038);
- Documentation of traffic impacts associated with the subject lands;
- Identification of any traffic operational concerns;
- Identification of capacity requirements and road widening and signalization requirements (if necessary);
- Identification of mitigative measures to address deficiencies (if necessary); and,
- Comment on adequacy and functionality of the proposed site accesses.

## 1.2. Future Road Network

Based on the site concept plan, the proposed development will provide three (3) new municipal road connections via 3<sup>rd</sup> Line. Sideroad 10 (Site Access 1) and Site Access 3 via 3<sup>rd</sup> Line is proposed to maintain a 20 meter right-of-way (ROW) while Site Access 2 via 3<sup>rd</sup> Line is proposed to maintain a 26 meter ROW. For assessment purpose, Site Access 1 and Site Access 2 will be constructed to service Phase 1 and Phase 2 of the development. Site Access 3 will be provided during Phase 3 development.

## 1.3. Study Methodology

Weekday morning, weekday afternoon and Saturday peak period traffic volume counts were undertaken by Dynamic Traffic Solutions on behalf of Cole Engineering in August 2011. This data is grown by a 2% annual growth rate to represent existing 2012 baseline conditions for the study area intersections. As per the Ministry of Transportation of Ontario (MTO) guidelines, traffic analysis must be undertaken for every major phase of development and five (5) and ten (10) years post occupancy.

Future background traffic volumes for the 2017, 2022 and 2028 horizon years, excluding the additional traffic volumes generated by the proposed development, consists of the following components: traffic growth from outside the study area and traffic generated within the study area from other proposed developments in the vicinity of the subject development.

Future total traffic conditions for the 2017, 2022, 2028, 2033 and 2038 horizon years will be determined by the summation of the estimated traffic volumes generated by the site traffic volumes and the respective background traffic volumes.

The study area intersections will be analyzed using SYNCHRO 6.0 software which utilizes the U.S. Transportation Research Board Highway Capacity Manual 2000 methodology.

## 1.4. Study Area Road Network

The subject site is located on the southeast quadrant of Highway 26, east of 3<sup>rd</sup> Line and north of Sideroad 7. The road network description is as follows:

**Highway 26** is a two (2) lane east-west undivided Provincial Highway (Kings Highway) under the jurisdiction of Ministry of Transportation of Ontario (MTO). It maintains a posted speed limit of 80 km/h, 200 meters east of County Road 7 and a posted speed limit of 50 km/h west of County Road 7. West of County Road 7, the road becomes an arterial road – Skyes Street through the community of Meaford.

**Skyes Street** is a two (2) lane major arterial road west of St. Vincent Street under the jurisdiction of the Ministry of Transportation of Ontario (MTO). It maintains a speed limit of 50 km/h within the study area.

**St. Vincent Road** is a two (2) lane County Road in under the jurisdiction of the County of Grey. It maintains a posted speed limit of 50 km/h within the study area.

**County Road 7** is a two (2) lane arterial road under the jurisdiction of Municipality of Meaford. It maintains a posted speed limit of 80 km/h within the study area and consists of a gravelled surface and open ditches on either side.

**McKibbon Drive** is a two (2) lane cul-du-sac local road under the jurisdiction of the Municipality of Meaford. It maintains a posted speed limit of 50 km/h within the study area.

**3<sup>rd</sup> Line** is a two (2) lane local road under the jurisdiction of Municipality of Meaford. It maintains an unposted speed limit of 60 km/h within the study area and consists of hard surface-paved surface with open ditches on either side. South of Sideroad 10, 3<sup>rd</sup> Line is unpaved and is considered to be an “unopened road allowance” roadway.

**Sideroad 7** is a two (2) lane local road under the jurisdiction of Municipality of Meaford. It maintains an unposted speed limit of 60 km/h within the study area. Between 3<sup>rd</sup> Line and County Road 7, it is considered a seasonal road and consists of a gravelled surface with ditches.

**Sideroad 10** is a two (2) lane local road under the jurisdiction of the Municipality of Meaford. It maintains an unposted speed limit of 60 km/h within the study area.

A copy of the *Municipality of Meaford Official Plan Schedule C-2* is provided in **Appendix A** for reference.

## 1.5. Horizon Year

Five year (2017), ten year (2022) and a sixteen year (2028) horizons were selected to represent future traffic conditions. These horizon years coincide with partial and “full-build-out” of the development proposal. Based on MTO guidelines, a five year (2033) and ten year (2038) were selected to represent future traffic conditions post build-out (i.e. annual growth).

## 2.0 Existing Conditions

### 2.1. Existing Data

The key study area intersections include the following:

- Highway 26-McKibbin Drive-Sykes Street and County Road 7-St Vincent Street;
- Highway 26 and 3<sup>rd</sup> Line;
- 3<sup>rd</sup> Line and Sideroad 10;
- 3<sup>rd</sup> Line and Sideroad 7; and,
- County Road 7 and Sideroad 7.

All of the above existing intersections are currently unsignalized with stop control on the minor approach with the exception of Highway 26-Sykes Street-McKibbin Drive and County Road 7-St. Vincent Street, which is currently signalized.

Turning Movement Counts (TMC) for the above noted intersections were undertaken on Thursday August 5, 2011 during the morning peak period (7:00 am – 9:00 am) and afternoon peak period (4:00 pm – 6:00 pm) and Saturday August 6, 2011 (11:00 am – 3:00 pm) by Dynamic Traffic Solutions on behalf of Cole Engineering. These volumes were grown at a 2% annual growth rate to represent 2012 traffic volumes based on the Historical Annual Average Daily Traffic volumes obtained from the Ministry of Transportation of Ontario (MTO) website.

Future intersections to be assessed as part of the analysis include the following:

- 3<sup>rd</sup> Line and Sideroad 10-Site Access 1;
- 3<sup>rd</sup> Line and Site Access 2; and,
- 3<sup>rd</sup> Line and Site Access 3.

The existing road network, lane configuration and existing traffic control for the study area intersections is shown in **Figure 2-1**. Existing turning movement counts are shown in **Figure 2-2**. The detailed traffic data is provided in **Appendix B**.

### 2.2. Existing Traffic Assessment

The existing traffic volumes were analyzed using SYNCHRO 6.0 software. The methodology of the software follows the procedures described and outlined in the Highway Capacity Manual 2000, published by the Transportation Research Board. The results of the SYNCHRO analysis for the existing conditions are summarized in **Table 2.1** and the detailed analysis sheets are provided in **Appendix C**.

**Table 2.1 – Levels of Service – Existing Conditions**

Intersections	Movements	AM Peak LOS (v/c)	PM Peak LOS (v/c)	SAT Peak LOS (v/c)
Highway 26-McKibbin Drive-Sykes Street and County Road 7-St Vincent Street (Signalized)	<b>Overall</b>	<b>C (0.28)</b>	<b>C (0.47)</b>	<b>C (0.28)</b>
	EB left-through-right	D (0.14)	D (0.10)	D (0.12)
	NB left-through	A (0.12)	B (0.19)	A (0.14)
	NB right	A (0.01)	B (0.01)	A (0.01)
	SB left-through-right	A (0.09)	B (0.25)	A (0.11)
	SE left	C (0.03)	C (0.09)	C (0.03)
	SE through-right	D (0.70)	C (0.68)	D (0.68)
	NW left	C (0.04)	C (0.14)	C (0.05)
Highway 26 / 3rd Line (Unsignalized)	NW through-right	C (0.63)	D (0.83)	C (0.61)
	EB left-through-right	A (<0.01)	A (<0.01)	A (<0.01)
	WB left-through-right	A (<0.01)	A (<0.01)	A (0.01)
	NB left-through-right	B (0.04)	C (0.10)	B (0.08)
Sideroad 7 / 3 <sup>rd</sup> Line (Unsignalized)	SB left-through-right	B (<0.01)	C (0.01)	B (0.01)
	EB left-right	A (<0.01)	A (<0.01)	A (0.01)
Sideroad 7 / County Road 7 (Unsignalized)	NB left-through	A (<0.01)	-	-
	EB left-through-right	A (0.02)	A (<0.01)	A (0.01)
	WB left-through-right	A (0.01)	A (<0.01)	A (<0.01)
	NB left-through-right	A (0.01)	A (<0.01)	A (<0.01)
3rd Line / Sideroad 10 (Unsignalized)	SB left-through-right	-	-	A(<0.01)
	EB left-right	A (<0.01)	A (<0.01)	A (<0.01)
	NB left-through	A (<0.01)	-	A (<0.01)

The results indicate that under existing traffic conditions, the Highway 26 / County Road 7 / McKibbin Drive intersection operates at acceptable levels of service (LOS) with no individual movements operating above volume to capacity (v/c) of 0.85 or greater.

The study area unsignalized intersections operate at excellent levels of service during the peak time periods, with no individual movement operating with a volume to capacity (v/c) ratio of 0.85 or greater and no movement operating below level of service B.

### 3.0 Future Background Traffic Conditions

In assessing the impact the subject development proposal will have on the abutting road network, 5-year (2017), 10-year (2022) and 16-year (2028) study horizons were selected. Future background traffic volumes for the 2017, 2022 and 2028 horizon years, excluding the site generated traffic volumes, consists of the following components: background traffic growth from outside the study area and traffic generated within the study area from other proposed developments.

#### 3.1. Historical Annual Average Daily Traffic (AADT)

Historical Annual Average Daily Traffic (AADT) volumes from 1990 to 2007 were obtained from the Ministry of Transportation, Ontario (MTO) website for the segment of Highway 26 from *Thornbury West Limit-Peel Street to NA*. The historical AADT's are tabulated in **Table 3.1**.



**Table 3.1 – Historical Annual Average Daily Traffic**

Year	AADT Volume	Logarithmic % increase	Year	AADT Volume	Logarithmic % increase
1990	4750	-	1999	5650	0 %
1991	4800	1.04 %	2000	5850	3.42 %
1992	4900	2.04 %	2001	5950	1.68 %
1993	5200	5.77 %	2002	6050	1.65 %
1994	5150	-0.96 %	2003	6200	2.42 %
1995	5300	2.83 %	2004	6250	0.80 %
1996	5400	1.85 %	2005	6300	0.79 %
1997	5550	2.70 %	2006	6400	1.56 %
1998	5650	1.77 %	2007	6450	0.78 %
<b>Logarithmic Annual Growth Rate</b>					<b>1.90 %</b>

Web Reference: <http://www.ragsb.mto.gov.on.ca/techpubs/TrafficVolumes.nsf/tvweb>

There are no other active developments considered within the study area. Therefore, a conservative 2% annual growth rate was applied to the through movements along Highway 26 to reflect growth from outside the study area. **Figure 3-1, Figures 3-2 and Figure 3-3** illustrates the forecasted 2017, 2022 and 2028 background traffic for the weekday a.m., weekday p.m. and Saturday peak hours, respectively.

### 3.2. Future (2017) Background Traffic Analysis

Future (2017) background traffic operations for the study area intersections were assessed using SYNCHRO 6.0 software. The results of the analysis are summarized in **Table 3.2** and the detailed analysis sheets are provided in **Appendix D**.

**Table 3.2 – Levels of Service –Future (2017) Background Conditions**

Intersections	Movements	AM Peak LOS (v/c)	PM Peak LOS (v/c)	SAT Peak LOS (v/c)
Highway 26-McKibbin Drive-Sykes Street and County Road 7-St Vincent Street (Signalized)	<b>Overall</b>	<b>C (0.30)</b>	<b>C (0.51)</b>	<b>C (0.30)</b>
	EB left-through-right	D (0.14)	D (0.10)	D (0.12)
	NB left-through	A (0.13)	B (0.21)	A (0.14)
	NB right	A (0.01)	B (0.01)	A (0.01)
	SB left-through-right	A (0.10)	B (0.26)	A (0.11)
	SE left	C (0.03)	B (0.04)	C (0.03)
	SE through-right	D (0.73)	C (0.71)	D (0.71)
	NW left	C (0.04)	B (0.15)	C (0.05)
Highway 26 / 3rd Line (Unsignalized)	NW through-right	C (0.66)	D (0.86)	C (0.64)
	EB left-through-right	A (<0.01)	A (<0.01)	A (<0.01)
	WB left-through-right	A (<0.01)	A (<0.01)	A (0.01)
	NB left-through-right	B (0.04)	C (0.12)	C (0.09)
Sideroad 7 / 3 <sup>rd</sup> Line (Unsignalized)	SB left-through-right	B (<0.01)	C (<0.01)	B (0.01)
	EB left-right	A (<0.01)	A (<0.01)	A (0.01)
Sideroad 7 / County Road 7 (Unsignalized)	NB left-through	A (<0.01)	-	-
	EB left-through-right	A (0.02)	A (<0.01)	A (0.01)
	WB left-through-right	A (0.01)	A (<0.01)	A (<0.01)
	NB left-through-right	A (0.01)	A (<0.01)	A (<0.01)
3rd Line / Sideroad 10 (Unsignalized)	SB left-through-right	-	-	A (<0.01)
	EB left-right	A (<0.01)	A (<0.01)	A (<0.01)
	NB left-through	A (<0.01)	-	A (<0.01)

The results indicate that under future (2017) background traffic conditions, the unsignalized study intersections operate at excellent levels of service during the peak time periods, with no individual movement operating with a volume to capacity (v/c) ratio above capacity.

The signalized intersection of Highway 26-McKibbin Drive-Sykes Street and County Road 7-St Vincent Street is also expected to operate at good levels of services.

### 3.3. Future (2022) Background Traffic Analysis

Future (2022) background traffic operations for the study area intersections were assessed using SYNCHRO 6.0 software. The results of the analysis are summarized in **Table 3.3** and the detailed analysis sheets are provided in **Appendix E**.

**Table 3.3 – Levels of Service –Future (2022) Background Conditions**

Intersections	Movements	AM Peak LOS (v/c)	PM Peak LOS (v/c)	SAT Peak LOS (v/c)
Highway 26-McKibbin Drive-Sykes Street and County Road 7-St Vincent Street (Signalized)	<b>Overall</b>	<b>C (0.32)</b>	<b>C (0.55)</b>	<b>C (0.32)</b>
	EB left-through-right	D (0.14)	D (0.10)	D (0.12)
	NB left-through	A (0.13)	B (0.23)	A (0.15)
	NB right	A (0.01)	B (0.01)	A (0.01)
	SB left-through-right	A (0.11)	B (0.29)	A (0.12)
	SE left	C (0.03)	B (0.10)	C (0.03)
	SE through-right	D (0.77)	C (0.74)	D (0.75)
	NW left	C (0.05)	B (0.16)	C (0.05)
	NW through-right	C (0.70)	D (0.89)	C (0.67)
Highway 26 / 3rd Line (Unsignalized)	EB left-through-right	A (<0.01)	A (<0.01)	A (<0.01)
	WB left-through-right	A (<0.01)	A (<0.01)	A (0.01)
	NB left-through-right	B (0.04)	C (0.13)	C (0.10)
	SB left-through-right	B (<0.01)	C (<0.01)	B (0.01)
Sideroad 7 / 3 <sup>rd</sup> Line (Unsignalized)	EB left-right	A (<0.01)	A (<0.01)	A (0.01)
	NB left-through	A (<0.01)	-	-
Sideroad 7 / County Road 7 (Unsignalized)	EB left-through-right	A (0.02)	A (0.01)	A (0.01)
	WB left-through-right	A (0.01)	A (<0.01)	A (<0.01)
	NB left-through-right	A (0.01)	A (<0.01)	A (<0.01)
	SB left-through-right	-	-	A (<0.01)
3rd Line / Sideroad 10 (Unsignalized)	EB left-right	A (<0.01)	A (<0.01)	A (<0.01)
	NB left-through	A (<0.01)	-	A (<0.01)

The results indicate that under future (2022) background traffic conditions, the unsignalized study intersections continue to operate at excellent levels of service during the peak time periods, with no individual movement operating with a volume to capacity (v/c) ratio above capacity.

The signalized intersection of Highway 26-McKibbin Drive-Sykes Street and County Road 7-St Vincent Street is also expected to continue to operate at good levels of services.

### 3.4. Future (2028) Background Traffic Analysis

Future (2028) background traffic operations for the study area intersections were assessed using SYNCHRO 6.0 software. The results of the analysis are summarized in **Table 3.4** and the detailed analysis sheets are provided in **Appendix F**.

**Table 3.4 – Levels of Service –Future (2028) Background Conditions**

Intersections	Movements	AM Peak LOS (v/c)	PM Peak LOS (v/c)	SAT Peak LOS (v/c)
Highway 26-McKibbon Drive-Sykes Street and County Road 7-St Vincent Street (Signalized)	<b>Overall</b>	<b>C (0.35)</b>	<b>C (0.61)</b>	<b>C (0.35)</b>
	EB left-through-right	D (0.14)	D (0.10)	D (0.12)
	NB left-through	B (0.14)	B (0.25)	A (0.16)
	NB right	A (0.01)	B (0.01)	A (0.01)
	SB left-through-right	B (0.11)	B (0.31)	A (0.13)
	SE left	C (0.03)	B (0.11)	C (0.03)
	SE through-right	D (0.82)	D (0.78)	D (0.79)
	NW left	C (0.05)	B (0.19)	C (0.06)
	NW through-right	D (0.74)	D (0.95)	D (0.72)
Highway 26 / 3rd Line (Unsignalized)	EB left-through-right	A (<0.01)	A (<0.01)	A (<0.01)
	WB left-through-right	A (<0.01)	A (<0.01)	A (0.01)
	NB left-through-right	B (0.05)	C (0.16)	C (0.12)
	SB left-through-right	B (<0.01)	C (0.01)	B (0.01)
Sideroad 7 / 3 <sup>rd</sup> Line (Unsignalized)	EB left-right	A (<0.01)	A (<0.01)	A (0.01)
	NB left-through	A (<0.01)	-	-
Sideroad 7 / County Road 7 (Unsignalized)	EB left-through-right	A (0.02)	A (0.01)	A (0.01)
	WB left-through-right	A (0.01)	A (<0.01)	A (<0.01)
	NB left-through-right	A (0.01)	A (<0.01)	A (<0.01)
	SB left-through-right	-	-	A (<0.01)
3rd Line / Sideroad 10 (Unsignalized)	EB left-right	A (<0.01)	A (<0.01)	A (<0.01)
	NB left-through	A (<0.01)	-	A (<0.01)

The results indicate that under future (2028) background traffic conditions, the unsignalized study intersections continue to operate at excellent levels of service during the peak time periods, with no individual movement operating with a volume to capacity (v/c) ratio above capacity.

The signalized intersection of Highway 26-McKibbon Drive-Sykes Street and County Road 7-St Vincent Street is also expected to continue to operate at good levels of services.

## 4.0 Site Generated Traffic

The site development at “full build-out” will consist of the following land uses and variables:

- Permanent Residential = 214 units;
- Seasonal Residential = 863 units;
- Golf Course = 9 holes;
- Resort Hotel = 60 rooms;
- Retail = 20,000 ft<sup>2</sup> (Ancillary); and,
- Aquatics and Fitness Centre = 32,000 ft<sup>2</sup>.

For assessment purposes, the subject development proposal will be analyzed in three horizon periods 2017, 2022 and 2028 corresponding to the various phases of the development.

The retail component is considered “ancillary” and is not expected to generate any external vehicular trips to its location well within the development as well as its general function to service the primary uses.

#### 4.1. Traffic Generation

The methods used to estimate the vehicular trips associated with the subject site were based on the *Trip Generation Manual, 8<sup>th</sup> Edition*, published by ITE. The following development’s land uses were applied to the applicable land use code:

- Residential Single Family – Land Use Code 210;
- Residential Townhouses – Land Use Code 230;
- Recreational Homes – Land Use Code 260;
- Golf Course – Land Use Code 430;
- Resort Hotel – Land Use Code 330; and,
- Aquatics and Fitness Centre – Land Use Code 492.

The permanent residential development consists of residential single family dwellings, semi-detached dwellings and residential townhouses. Land use code 210 was applied to both residential single family dwellings and semi-detached dwellings. Land use code 230 was applied to residential townhouse dwellings.

For the seasonal residential, land use code 260 was applied, as this land use is considered a second home for recreational style residential. A breakdown of the development phasing and order of magnitude for the developmental proposal is provided in **Table 4.1**.

**Table 4.1 – Development Phasing**

Land Use	Phase 1 (2017)	Phase 2 (2022)	Phase 3 (2028)	Total
Permanent Low-Density Residential	42 units	60 units	68 units	170 units
Permanent Residential Townhouse	11 units	16 units	17 units	44 units
Seasonal Residential	184 units	314 units	365 units	863 units
Resort Hotel	60 units	-	-	60 units
Aquatics and Fitness Centre	32,000 ft <sup>2</sup>	-	-	32,000 ft <sup>2</sup>
Retail (Ancillary)	20,000 ft <sup>2</sup>	-	-	20,000 ft <sup>2</sup>
Golf Course	9 holes	-	-	9 holes

The trip generation for the Phase 1 site development is summarized in **Table 4.2**.

**Table 4.2 – Phase 1 – Site Trip Generation**

Use / Variable	Parameter	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Residential Single Family Dwelling (42 units)	Gross Trips	10	29	39	30	18	48	25	22	47
	Gross Trip Rates	0.23	0.70	0.93	0.72	0.42	1.14	0.59	0.53	1.12
Residential Townhouses (11 units)	Gross Trips	2	7	9	7	3	10	25	21	46
	Gross Trip Rates	0.14	0.68	0.82	0.61	0.30	0.91	2.26	1.92	4.18
Recreation Homes (184 units)	Gross Trips	19	10	29	20	28	48	32	34	66
	Gross Trip Rates	0.11	0.05	0.16	0.11	0.15	0.26	0.17	0.19	0.36
Golf Course (9 holes)	Gross Trips	16	4	20	11	14	25	11	14	25
	Gross Trip Rates	1.75	0.47	2.22	1.25	1.53	2.78	1.25	1.53	2.78
Resort Hotel (60 units)	Gross Trips	17	11	28	11	14	25	37	37	74
	Gross Trip Rates	0.29	0.18	0.47	0.18	0.24	0.42	0.62	0.61	1.23
Aquatics and Fitness Centre (32,000 ft <sup>2</sup> )	Gross Trips	11	33	44	64	49	113	40	49	89
	Gross Trip Rates	0.35	1.03	1.38	2.01	1.52	3.53	1.25	1.53	2.78
<b>Total</b>	<b>New Trips</b>	<b>75</b>	<b>94</b>	<b>169</b>	<b>143</b>	<b>126</b>	<b>269</b>	<b>170</b>	<b>177</b>	<b>347</b>

Based on the site statistics, the proposed development is expected to generate 169 new vehicular two-way trips during the morning peak period (75 trips in / 94 trips out), 269 new vehicular two-way trips during the afternoon peak period (143 trips in / 126 trips out), and 347 new vehicular two-way trips during the Saturday peak period (170 trips in / 177 trips out). Phase 1 site traffic was assigned to the future road network and is illustrated in **Figure 4-1**.

The trip generation for the Phase 2 site development is summarized in **Table 4.3**.

**Table 4.3 – Phase 2 – Site Trip Generation**

Use / Variable	Parameter	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Residential Single Family Dwelling (60 units)	Gross Trips	13	39	52	42	24	66	33	30	63
	Gross Trip Rates	0.22	0.65	0.87	0.69	0.41	1.10	0.56	0.49	1.05
Residential Townhouses (16 units)	Gross Trips	2	10	12	9	4	13	25	22	47
	Gross Trip Rates	0.13	0.62	0.75	0.54	0.27	0.81	1.59	1.35	2.94
Recreation Homes (314 units)	Gross Trips	34	16	50	34	48	82	54	59	113
	Gross Trip Rates	0.11	0.05	0.16	0.11	0.15	0.26	0.17	0.19	0.36
<b>Total</b>	<b>New Trips</b>	<b>49</b>	<b>65</b>	<b>114</b>	<b>85</b>	<b>76</b>	<b>161</b>	<b>112</b>	<b>111</b>	<b>223</b>

Based on the site statistics, the proposed development is expected to generate 114 new vehicular two-way trips during the morning peak period (49 trips in / 65 trips out), 161 new vehicular two-way trips during the afternoon peak period (85 trips in / 76 trips out), and 223 new vehicular two-way trips during the Saturday peak period (112 trips in / 111 trips out). Phase 2 site traffic was assigned to the future road network and is illustrated in **Figure 4-2**.

The trip generation for the Phase 3 (2028) site development is summarized in **Table 4.4**.

**Table 4.4 – Phase 3 – Site Trip Generation**

Use / Variable	Parameter	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Residential Single Family Dwelling (68 units)	Gross Trips	14	43	57	47	27	74	37	33	70
	Gross Trip Rates	0.21	0.63	0.84	0.69	0.40	1.09	0.55	0.48	1.03
Residential Townhouses (17 units)	Gross Trips	2	11	13	9	5	14	26	22	48
	Gross Trip Rates	0.13	0.6.3	0.76	0.55	0.27	0.82	1.52	1.30	2.82
Recreation Homes (365 units)	Gross Trips	39	19	58	39	56	95	63	68	131
	Gross Trip Rates	0.11	0.05	0.16	0.11	0.15	0.26	0.17	0.19	0.36
<b>Total</b>	<b>New Trips</b>	<b>55</b>	<b>73</b>	<b>128</b>	<b>95</b>	<b>88</b>	<b>183</b>	<b>126</b>	<b>123</b>	<b>249</b>

Based on the site statistics, the proposed development is expected to generate 128 new vehicular two-way trips during the morning peak period (55 trips in / 73 trips out), 183 new vehicular two-way trips during the afternoon peak period (95 trips in / 88 trips out), and 249 new vehicular two-way trips during the Saturday peak period (126 trips in / 123 trips out). Phase 3 site traffic was assigned to the future road network and is illustrated in **Figure 4-3**.

The details of the trip generation under “Full Build-out” are summarized in **Table 4.5**.

**Table 4.5 – “Full Build-out” – Site Trip Generation**

Phase	Parameter	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Phase 1 Total	New Trips	75	94	169	143	126	269	170	177	347
Phase 2 Total	New Trips	49	65	114	85	76	161	112	111	223
Phase 3 Total	New Trips	55	73	128	95	88	183	126	123	249
<b>“Full Build-out” Total</b>	<b>New Trips</b>	<b>179</b>	<b>232</b>	<b>411</b>	<b>323</b>	<b>290</b>	<b>613</b>	<b>408</b>	<b>411</b>	<b>819</b>

The proposed development at “full build-out” is expected to generate 411 new vehicular two-way trips during the morning peak period (179 trips in / 232 trips out), 613 new vehicular two-way trips during the afternoon peak period (323 trips in / 290 trips out), and 819 new vehicular two-way trips during the Saturday peak period (408 trips in / 411 trips out). The “Full Build-out” total site traffic projections were assigned to the future road networks and are illustrated in **Figure 4-4**.

## 4.2. Trip Distribution

The trip distribution is based on information obtained from the 2006 Transportation Tomorrow Survey (TTS) undertaken by the Data Management Group and the existing traffic patterns. The details of the trip distribution applied to all peak periods are summarized in **Table 4.6**.

**Table 4.6 – Site Trip Distribution**

Direction	Via	AM Peak		PM Peak		SAT Peak	
		Trips In	Trips Out	Trips In	Trips Out	Trips In	Trips Out
North	County Road 7	8%	4%	10%	4%	5%	4%
South	County Road 7	12%	12%	10%	10%	8%	12%
South	3 <sup>rd</sup> Line	4%	3%	3%	3%	3%	4%
East	Highway 26	51%	54%	58%	57%	40%	55%
East	Sideroad 7	0%	0%	0%	1%	2%	0%
West	Highway 26	22%	24%	17%	22%	40%	22%
West	Sideroad 7	3%	3%	2%	3%	2%	3%
<b>Total</b>		<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

## 5.0 Future Total Traffic Conditions

The future total traffic conditions consists the summation of the future background traffic volumes and the expected site traffic volumes. The future lane configuration networks for the 2017, 2022 and 2028 horizons are illustrated in **Figure 5-1**, **Figure 5-2** and **Figure 5-3**, respectively.

### 5.1. Future (2017) Total Traffic Assessment

The future (2017) total traffic operations for the study area intersections were assessed using SYNCHRO 6.0 software. The results of the analysis are summarized in **Table 5.1** and the future (2017) total traffic volumes illustrated in **Figure 5-4** with the detailed analysis sheets provided in **Appendix G**.

For the intersection of Highway 26 and 3<sup>rd</sup> Line, a left turn warrant was undertaken for the westbound movement and is met (see **Appendix L**). Furthermore, signal warrants were undertaken but were found not to be met (see **Appendix M**). However, with the construction of the left turn lanes along Highway 26, it is recommended that conduits for possible signal control are to be implemented during this phase.

**Table 5.1 – Levels of Service –Future (2017) Total Conditions**

Intersections	Movements	AM Peak LOS (v/c)	PM Peak LOS (v/c)	SAT Peak LOS (v/c)
Highway 26-McKibbin Drive-Sykes Street and County Road 7-St Vincent Street (Signalized)	<b>Overall</b>	<b>C (0.30)</b>	<b>C (0.55)</b>	<b>C (0.36)</b>
	EB left-through-right	D (0.14)	D (0.10)	D (0.12)
	NB left-through	A (0.13)	B (0.24)	A (0.17)
	NB right	A (0.01)	B (0.01)	A (0.01)
	SB left-through-right	A (0.11)	B (0.31)	A (0.13)
	SE left	C (0.03)	B (0.11)	C (0.03)
	SE through-right	D (0.73)	C (0.72)	D (0.80)
	NW left	C (0.05)	B (0.14)	C (0.06)
Highway 26 / 3rd Line (Unsignalized – left-turn lanes)	NW through-right	D (0.70)	D (0.87)	C (0.66)
	EB left	A (<0.01)	A (<0.01)	A (<0.01)
	WB left	A (0.04)	A (0.08)	A (0.07)
	NB left-through-right	B (0.19)	C (0.43)	C (0.45)
Highway 26 / 3rd Line (Unsignalized)	SB left-through-right	B (<0.01)	D (0.01)	B (0.01)
	EB left-through-right	A (<0.01)	A (<0.01)	A (<0.01)
	WB left-through-right	A (0.06)	A (0.08)	A (0.07)
	NB left-through-right	B (0.19)	C (0.43)	C (0.45)
Sideroad 7 / 3 <sup>rd</sup> Line (Unsignalized)	SB left-through-right	B (<0.01)	D (0.01)	B (0.01)
	EB left-right	A (0.02)	A (0.03)	A (0.06)
Sideroad 7 / County Road 7 (Unsignalized)	NB left-through	A (<0.01)	-	-
	EB left-through-right	A (0.02)	A (0.01)	B (0.02)
	WB left-through-right	A (0.03)	A (0.03)	B (0.06)
	NB left-through-right	A (0.01)	A (<0.01)	A (<0.01)
3rd Line / Sideroad 10-Site Access 1 (Unsignalized)	SB left-through-right	A (<0.01)	A (0.01)	A (0.02)
	EB left-through-right	A (<0.01)	A (0.01)	A (<0.01)
	WB left-through-right	A (0.04)	B (0.04)	B (0.07)
	NB left-through-right	A (<0.01)	-	A (<0.01)
3 <sup>rd</sup> Line / Site Access 2 (Unsignalized)	SB left-through-right	A (0.01)	A (0.02)	A (0.03)
	WB left-right	A (0.07)	A (0.11)	A (0.15)
	SB left-through	A (0.02)	A (0.06)	A (0.06)

The results indicate that under future (2017) total traffic conditions, the intersections of Highway 26-McKibbin Drive-Sykes Street and County Road 7-St Vincent Street is expected to operate at acceptable levels of service during the peak time period with no individual movements operating above capacity.

All the unsignalized intersections are expected to operate at excellent levels of service during the peak time periods, with no individual movement operating with a volume to capacity (v/c) ratio of 0.85 or greater.

Further road improvements include hard surface treatment for the segment of 3<sup>rd</sup> Line south to Sideroad 7 as well as Sideroad 7 from 3<sup>rd</sup> Line to County Road 7.

## 5.2. Future (2022) Total Traffic Assessment

The future (2022) total traffic operations for the study area intersections were assessed using SYNCHRO 6.0 software. The results of the analysis are summarized in **Table 5.2** and the future (2022) total traffic volumes illustrated in **Figure 5-5** with the detailed analysis sheets provided in **Appendix H**.



The intersection of Highway 26 and 3<sup>rd</sup> Line is expected to operate with a level of service F during the afternoon and Saturday peak hour in the unsignalized configuration. To mitigate this, signal warrants were undertaken and were found to be 103% warranted (see **Appendix M**). The intersection was therefore assessed at both unsignalized and signalized configurations. Under signalized control, the Highway 26 and 3<sup>rd</sup> Line intersection is expected to operate at acceptable levels of service with no individual movement expected to operate above capacity. A northbound left turn lane was not warranted, however, it was required operationally.

**Table 5.2 – Levels of Service –Future (2022) Total Conditions**

Intersections	Movements	AM Peak LOS (v/c)	PM Peak LOS (v/c)	SAT Peak LOS (v/c)
Highway 26-McKibbin Drive-Sykes Street and County Road 7-St Vincent Street (Signalized)	<b>Overall</b>	<b>C (0.33)</b>	<b>C (0.61)</b>	<b>D (0.42)</b>
	EB left-through-right	D (0.14)	D (0.10)	D (0.12)
	NB left-through	B (0.14)	B (0.27)	B (0.19)
	NB right	A (0.01)	B (0.01)	A (0.01)
	SB left-through-right	A (0.12)	B (0.35)	B (0.15)
	SE left	C (0.03)	B (0.04)	C (0.03)
	SE through-right	D (0.78)	C (0.77)	D (0.90)
	NW left	C (0.06)	B (0.17)	C (0.07)
	NW through-right	D (0.76)	D (0.93)	C (0.71)
Highway 26 / 3rd Line (Signalized)	<b>Overall</b>	<b>B (0.34)</b>	<b>B (0.47)</b>	<b>C (0.46)</b>
	EB left	B (<0.01)	B (<0.01)	B (0.01)
	EB through-right	C (0.67)	C (0.74)	C (0.81)
	WB left	B (0.20)	B (0.38)	B (0.44)
	WB through-right	B (0.31)	B (0.49)	B (0.45)
	NB left	B (0.09)	B (0.16)	B (0.15)
	NB through-right	B (0.06)	B (0.08)	B (0.11)
Highway 26 / 3rd Line (Unsignalized – left-turn lanes)	SB left-through-right	B (<0.01)	B (<0.01)	C (<0.01)
	EB left	A (<0.01)	A (<0.01)	A (<0.01)
	WB left	A (0.06)	A (0.14)	A (0.12)
	NB left-through-right	C (0.33)	F (0.79)	F (0.84)
Sideroad 7 / 3 <sup>rd</sup> Line (Unsignalized)	SB left-through-right	C (0.01)	E (0.01)	C (0.02)
	EB left-through	A (0.03)	A (0.05)	A (0.09)
Sideroad 7 / County Road 7 (Unsignalized)	NB left-through	A (<0.01)	-	-
	EB left-through-right	A (0.02)	B (0.01)	B (0.03)
	WB left-through-right	B (0.05)	A (0.05)	B (0.10)
	NB left-through-right	A (0.01)	A (<0.01)	A (<0.01)
3rd Line / Sideroad 10-Site Access 1 (Unsignalized)	SB left-through-right	A (0.01)	A (0.01)	A (0.02)
	EB left-through-right	A (<0.01)	A (<0.01)	A (<0.01)
	WB left-through-right	B (0.09)	B (0.11)	B (0.19)
	NB left-through-right	A (<0.01)	-	A (<0.01)
3 <sup>rd</sup> Line / Site Access 2	SB left-through-right	A (0.03)	A (0.06)	A (0.08)
	WB left-right	A (0.09)	B (0.14)	B (0.22)
	SB left-through	A (0.03)	A (0.07)	A (0.08)

The results indicate that under future (2022) total traffic conditions, the intersection of Highway 26-McKibbin Drive-Sykes Street and County Road 7-St Vincent Street is expected to operate at acceptable overall level of service during the peak hours. However, during the Saturday peak hour, the southeast movement is expected to operate with a level of service “D” with a volume to capacity (v/c) ratios of 0.91. This movement is approaching capacity due to the heavy through volume along Highway 26.

All unsignalized study intersections are expected to operate at good levels of service during the peak time periods, with no individual movement operating above capacity with the exception of Highway 26 and 3<sup>rd</sup> Line. However; as previously mentioned, signalization will mitigate this poor operation and is recommended during this phase of the development.

### 5.3. Future (2028) Total Traffic Assessment

The future (2028) total traffic operations for the study area intersections were assessed using SYNCHRO 6.0 software. The results of the analysis are summarized in **Table 5.3** and the future (2028) total traffic volumes illustrated in **Figure 5-6** with the detailed analysis sheets provided in **Appendix I**.

A signal warrant for the Highway 26 and 3<sup>rd</sup> Line intersection was undertaken and it was found to be 141% warranted which exceeds the 120% threshold for existing intersections with forecasted traffic.

Left turn lane warrants were undertaken for the intersection of 3<sup>rd</sup> Line and Sideroad 10-Site Access 1 and 3<sup>rd</sup> Line site access 2. It was found to be warranted with a recommended storage of 15 meters (see **Appendix L**) for each intersection.

**Table 5.3 – Levels of Service –Future (2028) Total Conditions**

Intersections	Movements	AM Peak LOS (v/c)	PM Peak LOS (v/c)	SAT Peak LOS (v/c)
Highway 26-McKibbin Drive-Sykes Street and County Road 7- St Vincent Street (Signalized)	<b>Overall</b>	<b>D (0.37)</b>	<b>D (0.69)</b>	<b>D (0.49)</b>
	EB left-through-right	D (0.14)	D (0.10)	D (0.12)
	NB left-through	B (0.16)	B (0.31)	B (0.21)
	NB right	A (0.01)	B (0.01)	A (0.01)
	SB left-through-right	B (0.14)	C (0.40)	B (0.17)
	SE left	C (0.04)	C (0.11)	C (0.04)
	SE through-right	D (0.84)	D (0.85)	F (1.06)
	NW left	C (0.07)	C (0.24)	C (0.07)
Highway 26-McKibbin Drive-Sykes Street and County Road 7- St Vincent Street (Signalized – Optimized)	<b>Overall</b>	<b>D (0.36)</b>	<b>D (0.67)</b>	<b>D (0.48)</b>
	EB left-through-right	E (0.18)	E (0.14)	E (0.11)
	NB left-through	B (0.15)	C (0.31)	B (0.23)
	NB right	B (0.01)	C (0.01)	B (0.01)
	SB left-through-right	B (0.13)	C (0.42)	B (0.19)
	SE left	C (0.05)	B (0.14)	C (0.02)
	SE through-right	D (0.84)	C (0.78)	D (0.88)
	NW left	C (0.08)	B (0.17)	C (0.08)
Highway 26 / 3 <sup>rd</sup> Line (Signalized)	<b>Overall</b>	<b>B (0.41)</b>	<b>C (0.55)</b>	<b>C (0.55)</b>
	EB left	B (<0.01)	B (<0.01)	B (0.01)
	EB through-right	C (0.69)	C (0.79)	C (0.86)
	WB left	A (0.26)	B (0.50)	C (0.72)
	WB through-right	A (0.31)	B (0.51)	B (0.47)
	NB left	B (0.15)	B (0.22)	B (0.20)
	NB through-right	B (0.09)	B (0.11)	B (0.16)
	SB left-through-right	B (<0.01)	B (<0.01)	C (<0.01)

**Table 5.3 – Levels of Service – Future (2028) Total Conditions (cont'd)**

Intersections	Movements	AM Peak LOS (v/c)	PM Peak LOS (v/c)	SAT Peak LOS (v/c)
Sideroad 7 / 3 <sup>rd</sup> Line (Unsignalized)	EB left-right NB left-through	A (0.05) A (<0.01)	A (0.07) -	A (0.13) -
Sideroad 7 / County Road 7 (Unsignalized)	EB left-through-right WB left-through-right NB left-through-right SB left-through-right	A (0.02) B (0.08) A (0.01) A (0.01)	B (0.02) A (0.08) A (<0.01) A (0.02)	B (0.04) B (0.15) A (<0.01) A (0.04)
3 <sup>rd</sup> Line / Sideroad 10-Site Access 1 (Unsignalized)	EB left-through-right WB left-through-right NB left SB left	A (<0.01) B (0.13) A (<0.01) A (0.04)	A (<0.01) B (0.16) - A (0.08)	A (<0.01) C (0.28) A (<0.01) A (0.10)
3 <sup>rd</sup> Line / Site Access 2 (Unsignalized)	WB left-right SB left	A (0.10) A (0.03)	B (0.17) A (0.07)	B (0.27) A (0.09)
3 <sup>rd</sup> Line / Site Access 3 (Unsignalized)	WB left-right SB left	A (0.06) A (0.02)	A (0.08) A (0.04)	B (0.12) A (0.05)

The results indicate that under future (2028) total traffic conditions, the intersection of Highway 26-McKibbon Drive-Sykes Street and County Road 7-St Vincent Street is expected to operate at acceptable overall level of service during the peak hours. However, during the Saturday peak hour, the southeast through-right movement is expected to operate with a level of service “F” with a volume to capacity (v/c) ratios of 1.06. This movement is approaching capacity due to the heavy through volume along Highway 26. To mitigate this over-capacity, the intersection cycle length was optimized and resulted in acceptable level of services for peak periods

The intersection of Highway 26 and 3<sup>rd</sup> Line is expected to operate at acceptable levels of service with no individual movement functioning above capacity under signalized control.

All unsignalized study intersections is expected to operate at acceptable levels of service during the peak time periods, with no individual movement operating above capacity.

## 6.0 Recommended Road Improvements

Based on our analysis, the following road improvements are recommended for the ultimate build-out scenario. **Table 6.1** summarizes the proposed improvements.

**Table 6.1 – Roadway and Signal Improvement**

Horizon Period	Intersection – Road	Road Improvement Recommended
2017	3 <sup>rd</sup> Line	Paved Roadway
2017	Sideroad 7	Paved Roadway
2017	Highway 26 and 3 <sup>rd</sup> Line	Exclusive EB left turn lane Exclusive WB left turn lane Underground Conduit for future signalization
2022	Highway 26 and 3 <sup>rd</sup> Line	No Improvements Required
2028	Highway 26 and 3 <sup>rd</sup> Line	Signalization Exclusive NB left turn lane
2028	Highway 26 – McKibbon Drive and St. Vincent Road-County Road 7	Optimize Cycle Length
2028	Sideroad 10-Site Access 1 and 3 <sup>rd</sup> Line	Exclusive SB left turn lane

It is recommended that the gravelled roadway along 3<sup>rd</sup> Line be paved from Highway 26 to Sideroad 7 in the 2017 horizon.

## 7.0 Future Total Traffic Post “Full Build-out” Conditions

### 7.1. Future (2033) Total Traffic Assessment

The future (2033) total traffic operations for the study area intersections were assessed using SYNCHRO 6.0 software. The results of the analysis are summarized in **Table 7.1** and the future (2033) total traffic volumes illustrated in **Figure 7-1** with the detailed analysis sheets provided in **Appendix J**.

**Table 7.1 – Levels of Service –Future (2033) Total Conditions**

Intersections	Movements	AM Peak LOS (v/c)	PM Peak LOS (v/c)	SAT Peak LOS (v/c)
Highway 26-McKibbin Drive-Sykes Street and County Road 7- St Vincent Street (Signalized)	<b>Overall</b>	<b>D (0.39)</b>	<b>D (0.73)</b>	<b>D (0.50)</b>
	EB left-through-right	E (0.18)	E (0.14)	E (0.11)
	NB left-through	B (0.16)	C (0.34)	B (0.24)
	NB right	B (0.01)	C (0.01)	B (0.01)
	SB left-through-right	B (0.14)	C (0.47)	B (0.20)
	SE left	C (0.05)	B (0.14)	C (0.02)
	SE through-right	D (0.85)	C (0.81)	D (0.88)
	NW left	C (0.08)	B (0.20)	C (0.08)
	NW through-right	D (0.83)	D (0.98)	C (0.68)
Highway 26 / 3rd Line (Signalized)	<b>Overall</b>	<b>B (0.43)</b>	<b>B (0.58)</b>	<b>C (0.58)</b>
	EB left	B (<0.01)	B (<0.01)	B (0.01)
	EB through-right	C (0.72)	C (0.82)	D (0.89)
	WB left	A (0.27)	B (0.53)	C (0.76)
	WB through-right	A (0.33)	A (0.55)	B (0.51)
	NB left	B (0.15)	C (0.23)	B (0.21)
	NB through-right	B (0.09)	C (0.11)	B (0.16)
	SB left-through-right	B (<0.01)	B (<0.01)	C (<0.01)
Sideroad 7 / 3 <sup>rd</sup> Line (Unsignalized)	EB left- right	A (0.05)	A (0.07)	A (0.13)
	NB left-through	A (<0.01)	-	-
Sideroad 7 / County Road 7 (Unsignalized)	EB left-through-right	A (0.02)	B (0.02)	B (0.04)
	WB left-through-right	B (0.08)	A (0.08)	B (0.15)
	NB left-through-right	A (0.01)	A (<0.01)	A (<0.01)
	SB left-through-right	A (0.01)	A (0.02)	A (0.04)
3rd Line / Sideroad 10-Site Access 1 (Unsignalized)	EB left-through-right	A (<0.01)	A (<0.01)	A (<0.01)
	WB left-through-right	B (0.13)	B (0.16)	C (0.28)
	NB left	A (<0.01)	-	A (<0.01)
	SB left	A (0.04)	A (0.08)	A (0.10)
3 <sup>rd</sup> Line / Site Access 2 (Unsignalized)	WB left-right	A (0.10)	B (0.17)	B (0.27)
	SB left	A (0.03)	A (0.07)	A (0.09)
3 <sup>rd</sup> Line / Site Access 3 (Unsignalized)	WB left-right	A (0.06)	A (0.08)	B (0.12)
	SB left	A (0.02)	A (0.04)	A (0.05)

The results indicate that under future (2033) total traffic conditions, all unsignalized study intersections is expected to operate at acceptable levels of service during the peak time periods, with no individual movement operating above capacity.

The signalized intersections are expected to operate acceptable overall levels of services during the peak hour periods with no individual movements functioning above capacity.

## 7.2. Future (2038) Total Traffic Assessment

The future (2038) total traffic operations for the study area intersections were assessed using SYNCHRO 6.0 software. The results of the analysis are summarized in **Table 7.2** and the future (2038) total traffic volumes illustrated in **Figure 7-2** with the detailed analysis sheets provided in **Appendix K**.

**Table 7.2 – Levels of Service –Future (2038) Total Conditions**

Intersections	Movements	AM Peak LOS (v/c)	PM Peak LOS (v/c)	SAT Peak LOS (v/c)
Highway 26-McKibbin Drive-Sykes Street and County Road 7-St Vincent Street (Signalized)	<b>Overall</b>	<b>D (0.42)</b>	<b>D (0.79)</b>	<b>D (0.53)</b>
	EB left-through-right	E (0.18)	E (0.14)	E (0.11)
	NB left-through	B (0.17)	C (0.38)	C (0.26)
	NB right	B (0.01)	C (0.01)	B (0.01)
	SB left-through-right	B (0.15)	D (0.54)	B (0.22)
	SE left	C (0.05)	B (0.14)	C (0.02)
	SE through-right	D (0.86)	C (0.83)	D (0.89)
	NW left	C (0.09)	B (0.21)	C (0.09)
Highway 26 / 3rd Line (Signalized)	<b>Overall</b>	<b>B (0.46)</b>	<b>C (0.62)</b>	<b>C (0.61)</b>
	EB left	B (<0.01)	B (<0.01)	B (0.01)
	EB through-right	C (0.74)	C (0.85)	D (0.92)
	WB left	B (0.28)	B (0.57)	C (0.78)
	WB through-right	A (0.36)	A (0.59)	B (0.55)
	NB left	B (0.15)	C (0.24)	B (0.21)
	NB through-right	B (0.09)	C (0.11)	B (0.16)
	SB left-through-right	B (<0.01)	C (<0.01)	C (<0.01)
Sideroad 7 / 3 <sup>rd</sup> Line (Unsignalized)	EB left- right	A (0.05)	A (0.07)	A (0.13)
	NB left-through	A (<0.01)	-	-
Sideroad 7 / County Road 7 (Unsignalized)	EB left-through-right	A (0.02)	B (0.02)	B (0.04)
	WB left-through-right	B (0.08)	A (0.08)	B (0.15)
	NB left-through-right	A (0.01)	A (<0.01)	A (<0.01)
	SB left-through-right	A (0.01)	A (0.02)	A (0.04)
3rd Line / Sideroad 10-Site Access 1 (Unsignalized)	EB left-through-right	A (<0.01)	A (<0.01)	A (<0.01)
	WB left-through-right	B (0.13)	B (0.16)	C (0.28)
	NB left	A (<0.01)	-	A (<0.01)
	SB left	A (0.04)	A (0.08)	A (0.10)
3 <sup>rd</sup> Line / Site Access 2 (Unsignalized)	WB left-right	A (0.10)	B (0.17)	B (0.27)
	SB left	A (0.03)	A (0.07)	A (0.09)
3 <sup>rd</sup> Line / Site Access 3 (Unsignalized)	WB left-right	A (0.06)	A (0.08)	B (0.12)
	SB left	A (0.02)	A (0.04)	A (0.05)

The results indicate that under future (2038) total traffic conditions, all unsignalized study intersections is expected to operate at acceptable levels of service during the peak time periods, with no individual movement operating above capacity.

The signalized intersections are expected to operate acceptable overall levels of services during the peak hour periods with no individual movements functioning above capacity.

## 8.0 Warrants

### 8.1. Left Turn Warrant

Based on the *Geometric Design Standards for Ontario Highways* published by the Ministry of Transportation of Ontario (MTO), left turn warrants and storage lane lengths for two (2) lane highways; the unsignalized intersections were reviewed. The graphs were examined and the left turn lanes were recommended in the study area when warranted. The results are as follows:

- A left turn lane warrant was undertaken at the intersection of Highway 26 and 3<sup>rd</sup> Line for the implementation of a westbound left turn lane. The warrant was undertaken at the peak periods for the different horizons and was met with a recommended storage of 25 meters during the 2017 horizon period.
- A left turn lane warrant was undertaken at the intersection of 3<sup>rd</sup> Line and Sideroad 10-Site Access 1 for the implementation of a southbound left turn lane. The warrant was undertaken at the peak periods for the different horizons and was met with a recommended storage of 15 meters during the 2028 horizon period.

The completed left turn lane warrant analyses are provided in **Appendix L**.

### 8.2. Signal Warrant

At the intersection of Highway 26 and 3rd Line, the northbound movement at the unsignalized intersection is expected to operate at a level of service "F" during the afternoon and Saturday peak hours in the 2022 horizon. In order to mitigate this, the intersection was analyzed under signalized control. The signal warrant analysis at this intersection indicates that the Minimum Vehicle Volume warrant is met at 103% while the delay to cross traffic is 80% fulfilled for the weekday Saturday peak hour.

At the same intersection, the northbound movement at the unsignalized intersection is approaching capacity during the Saturday peak hour in the 2028 horizon. In order to mitigate this, the intersection was analyzed under signalized control. The Minimum Vehicle Volume warrant signal analysis at this intersection is met at 141% while the Delay to Cross Traffic is 123% fulfilled for the weekday Saturday peak hour and therefore warranted.

The signal warrants were calculated based on the Ontario Traffic Manual (OTM) Book 12 Justification 7 which requires the warrant to be 120% satisfied for projected future traffic volumes at existing intersections and 150% satisfied for projected future traffic volumes at future intersections. A copy of the signal warrants are provided in **Appendix M**.

The above signal warrant and related installations required MTO approval.

## 9.0 Site Review

Based on the site plan, there are three (3) main accesses proposed for this development with full movements via 3<sup>rd</sup> Line.

## 9.1. Site Access Design

As assessed, three (3) accesses are proposed to service the site via 3<sup>rd</sup> Line. The following are descriptions of these proposed accesses for the subject development:

- **3<sup>rd</sup> Line / Access 1:** proposed to be a full movement access with one (1) inbound lane and one (1) shared left-right outbound lane; and,
- **3<sup>rd</sup> Line / Access 2:** proposed to be a full movement access with one (1) inbound lane and one (1) shared left-right outbound lane.
- **3<sup>rd</sup> Line / Access 3:** proposed to be a full movement access with one (1) inbound lane and one (1) shared left-right outbound lane.

## 10.0 Conclusions

The findings and conclusions of our analysis are represented as follows:

### Development Proposal

- The development proposal at “full build-out” will consist of:
  - Permanent Residential = 214 units;
  - Seasonal Residential = 863 units;
  - Golf Course = 9 holes;
  - Resort Hotel = 60 rooms;
  - Retail = 20,000 ft<sup>2</sup> (Ancillary); and,
  - Aquatics and Fitness Centre = 32,000 ft<sup>2</sup>.
- Three (3) access points will be provided to service the proposed development via 3<sup>rd</sup> Line.

### Study Approach

- A 5-year (2017), a 10-year (2022) and a 16-year (2028) horizon assessment were completed for the proposed subject development.
- A further 5-year (2033) and 10-year (2038) horizon assessment was completed post “full build-out” of the subject development.
- A 2% annual growth rate was applied to all through movements within the study area.

### Existing Conditions

- The subject lands are currently vacant.
- Sideroad 7 and 3<sup>rd</sup> Line roadways are currently gravelled within the study area.

### Traffic Trip Generation

- The proposed development at “full build-out” is expected to generate 411 new vehicular two-way trips during the morning peak period, 613 new vehicular two-way trips during the afternoon peak period, and 819 new vehicular two-way trips during the Saturday peak period.

### Site Traffic Impacts

- The site traffic volumes generated in 2017 will have minimal impact to the study area intersections with the exception of Highway 26 and 3<sup>rd</sup> Line.
- The intersection of Highway 26 and 3<sup>rd</sup> Line will require signalization under the future (2028) total traffic conditions and meets signal warrant requirements.

- The intersection of Sideroad 10-Site Access 1 and 3<sup>rd</sup> Line will require an exclusive southbound left turn in lane into the site in the 2028 horizon period.
- Similarly, the intersection of Site Access 2 and 3<sup>rd</sup> Line will require an exclusive southbound left turn in lane into the site in the 2028 horizon period.
- Based on the expected new vehicular trips to the development, it is recommended that 3<sup>rd</sup> Line be paved from Highway 26 to Sideroad 7 as well as Sideroad 7 from 3<sup>rd</sup> Line to County Road 7 at completion of the First Phase of Development i.e., 2017.

#### **Future Conditions**

- During the future (2017) total traffic condition, the signalized intersection is expected to function with acceptable levels of service during the peak hour periods with no individual movements exceeding capacity.
- During the future (2022) total traffic condition, the signalized intersection of Highway 26-Skyes Drive-McKibbin Drive and St. Vincent Street-County Road is expected to operate with acceptable levels of service during the peak hour periods with no individual movements exceeding capacity.
- For the future (2028) total traffic condition, the intersection of Highway 26 and 3<sup>rd</sup> Line is warranted to operate as a signal control intersection.
- Similarly, during the future (2028) total traffic condition, all signalized intersections are expected to operate with acceptable levels of service during the peak hour periods with no individual movements exceeding capacity.
- For the future (2033) and (2038) total traffic condition, all signalized intersections are expected to operate with acceptable levels of service during the peak hour periods with no individual movements exceeding capacity.
- All the unsignalized intersections in the 2017, 2022, 2028, 2033 and 2038 horizons are expected to operate at excellent levels of services with no individual movements operating above capacity.

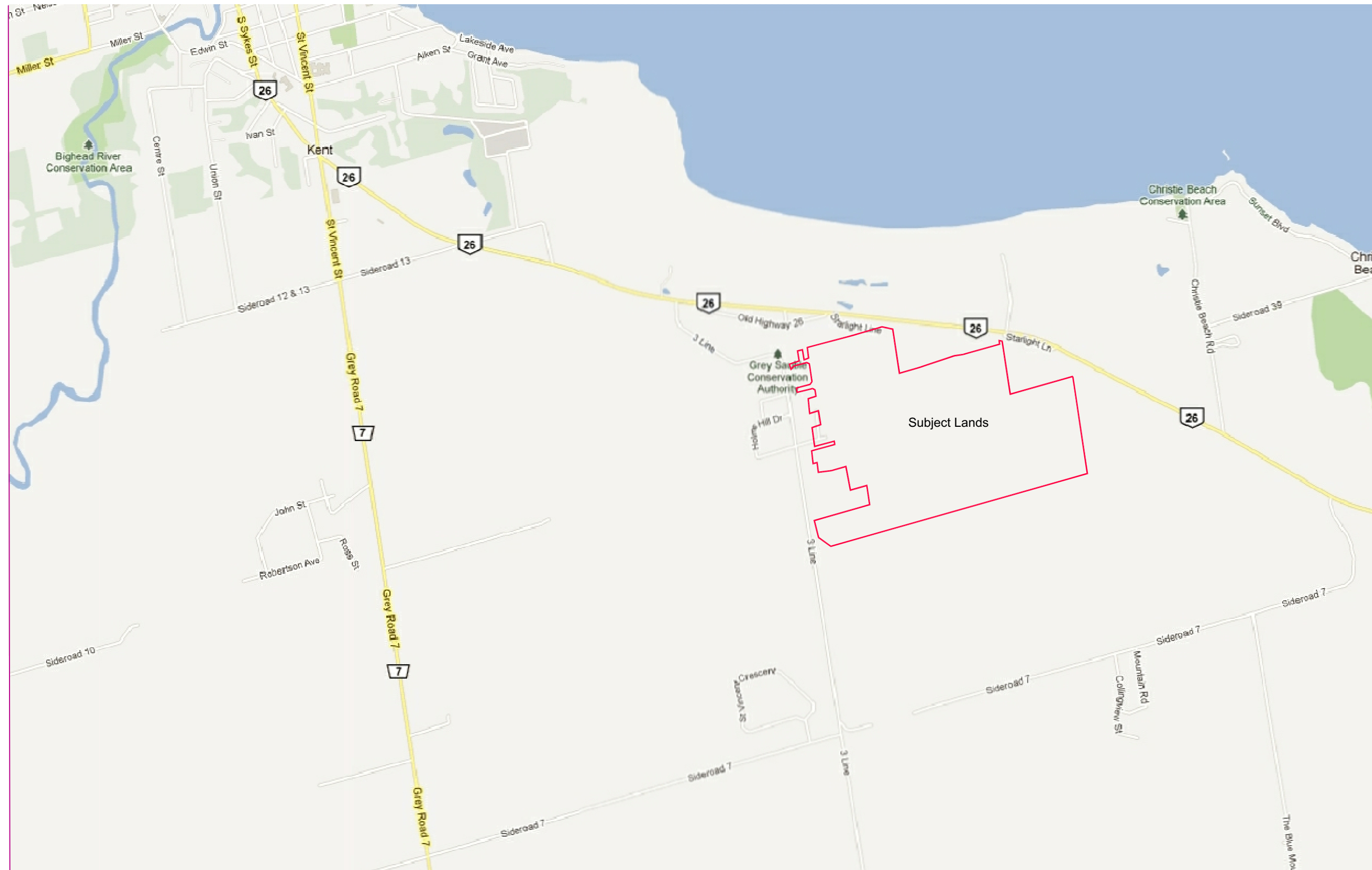
#### **Warrants**

- Eastbound and westbound left turn lanes are warranted at the intersection of Highway 26 and 3rd Line during the 2017 horizon period.
- Southbound left turn lane is warranted at the intersection of Sideroad 10-Site Access 1 and 3<sup>rd</sup> Line during the 2028 horizon period.
- Signal controls are warrants at the intersection of Highway 26 and 3rd Line during the 2028 horizon period.
- Operationally, a northbound left turn lane at the intersection of Highway 26 and 3<sup>rd</sup> Line is recommended in the 2028 horizon period.

#### **Access Design**

- The three (3) proposed site accesses will be full movements with stop control on the minor street.
- Each of the full movement accesses will maintain one (1) inbound lane and one (1) shared outbound lane required for ingress / egress.



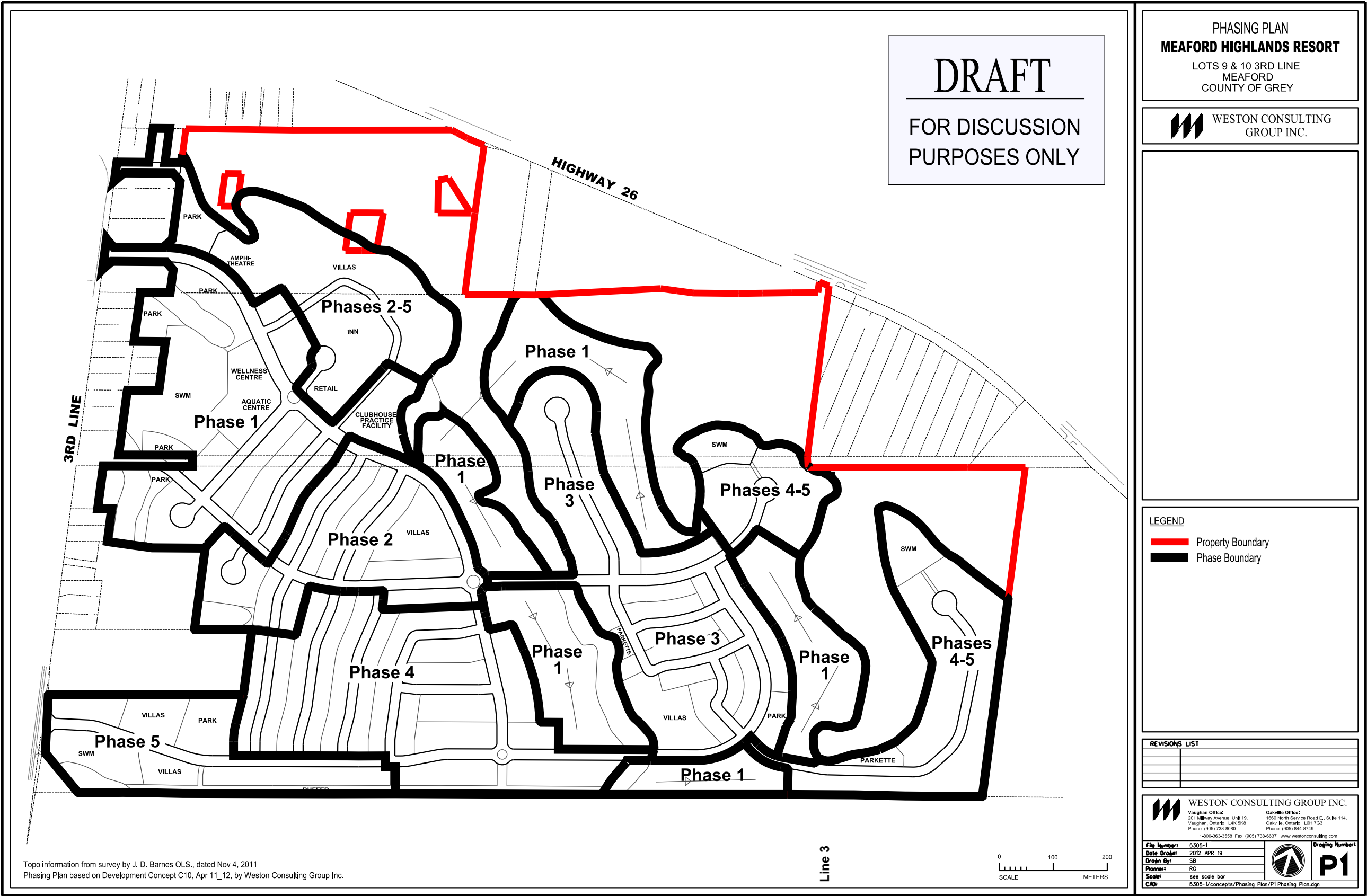


### Figure 1-1 Site Location



Figure 1-2  
Site Concept Plan





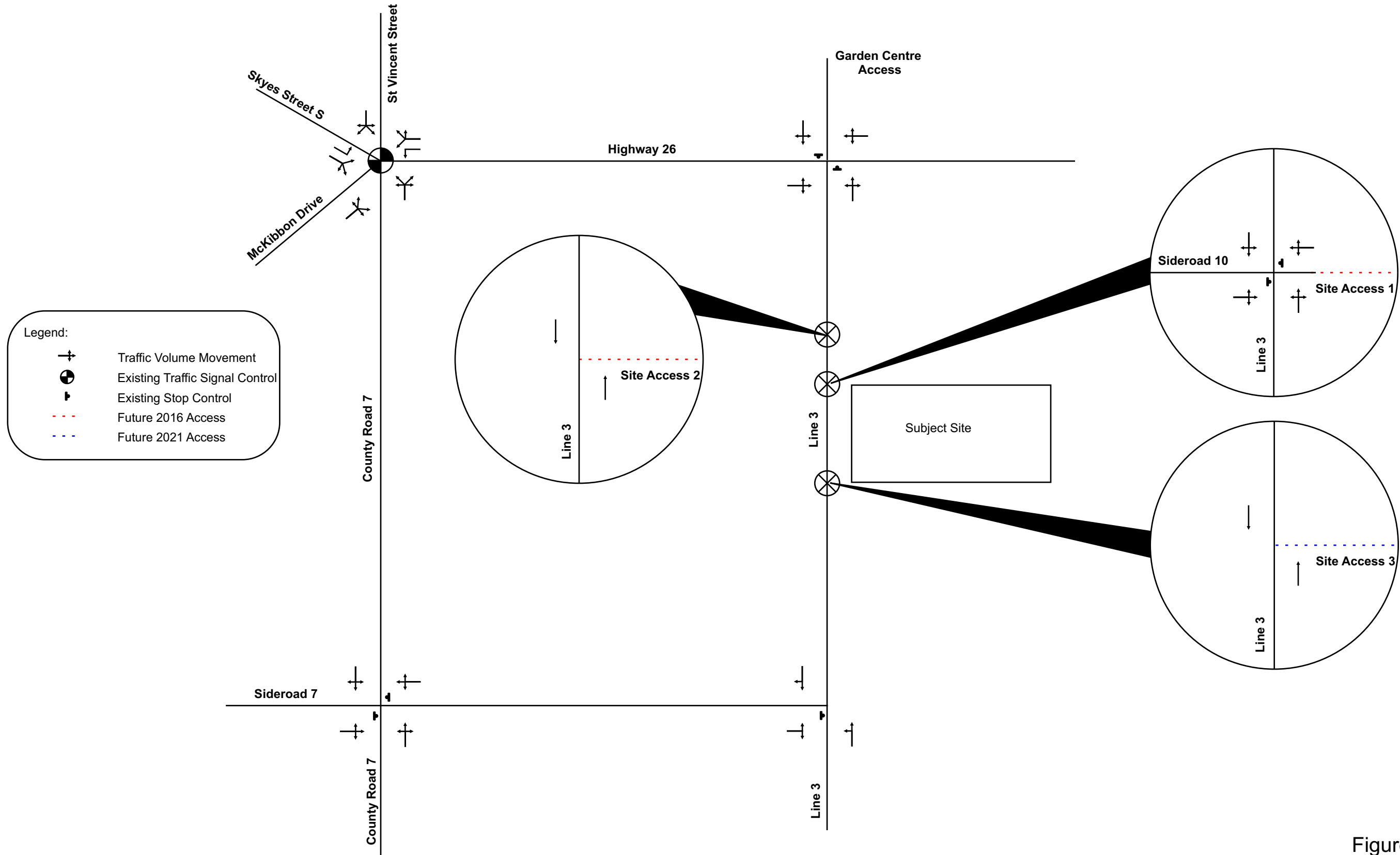


Figure 2-1  
Existing Lane Configuration



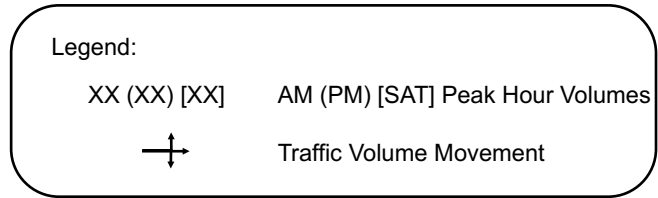


Figure 2-2  
2012 Existing Traffic Volumes

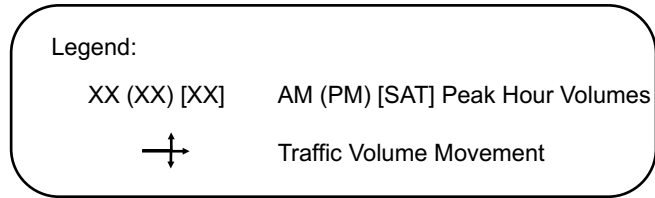


Figure 3-1  
Future (2017) Background Traffic Volumes

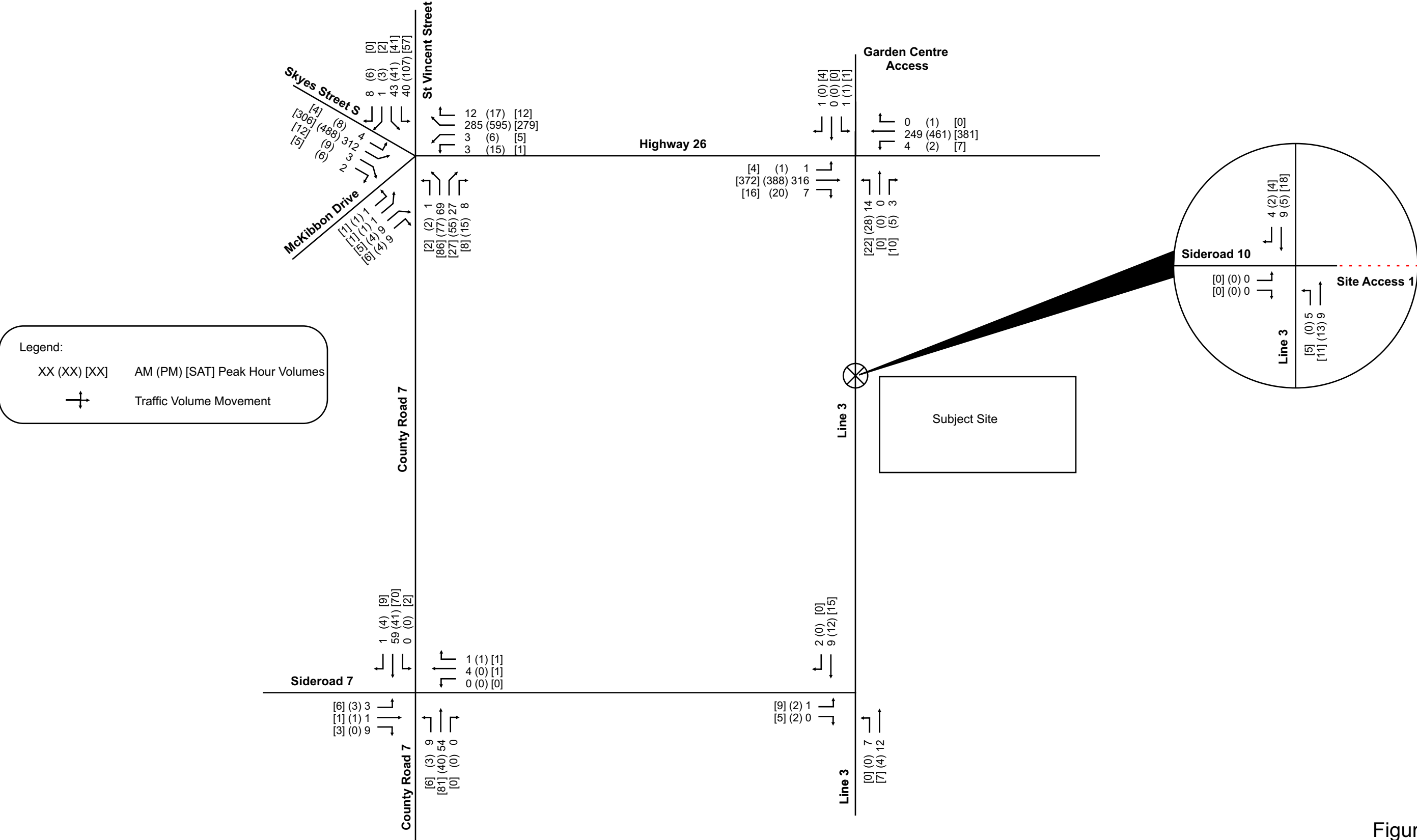


Figure 3-2  
Future (2022) Background Traffic Volumes

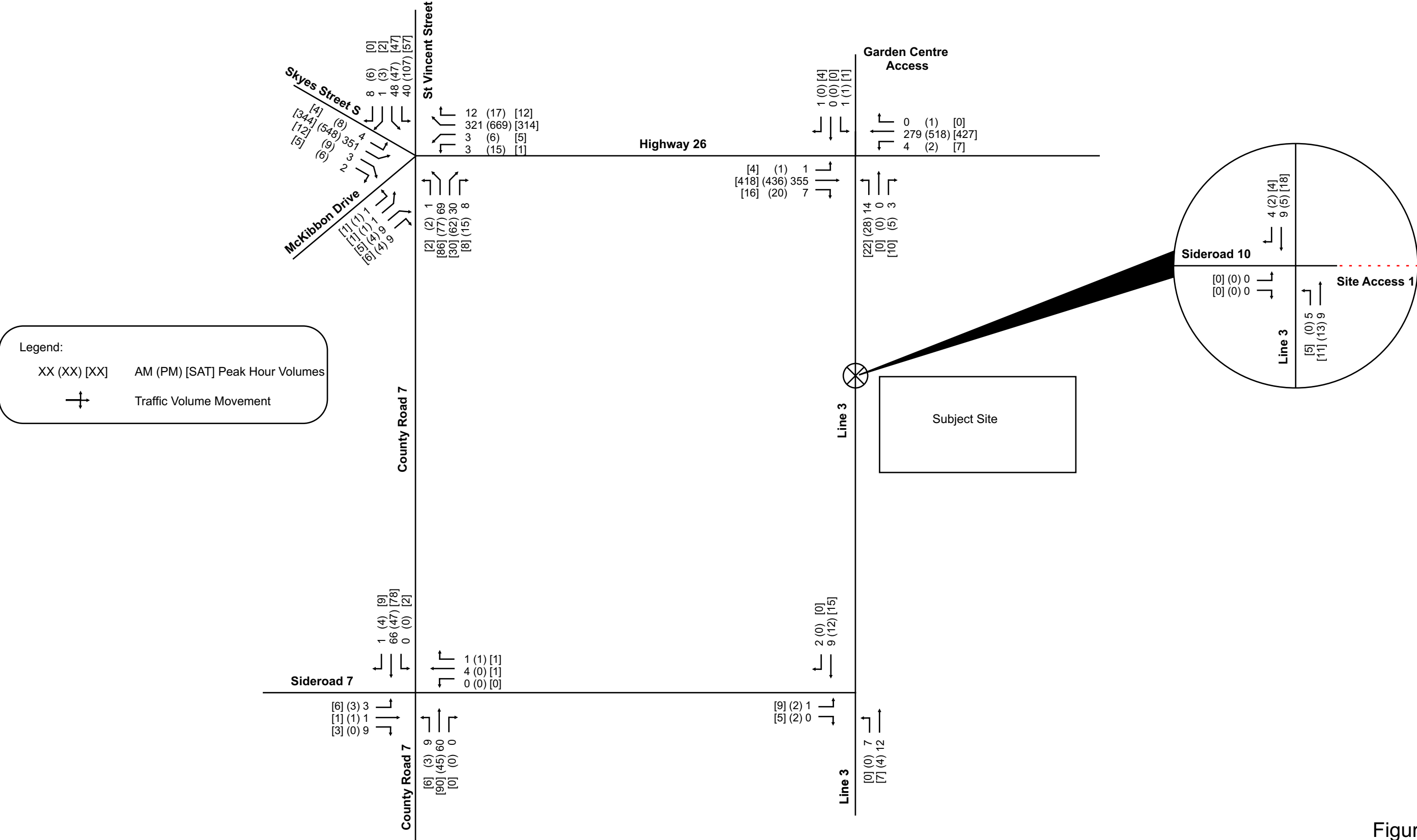


Figure 3-3  
Future (2028) Background Traffic Volumes



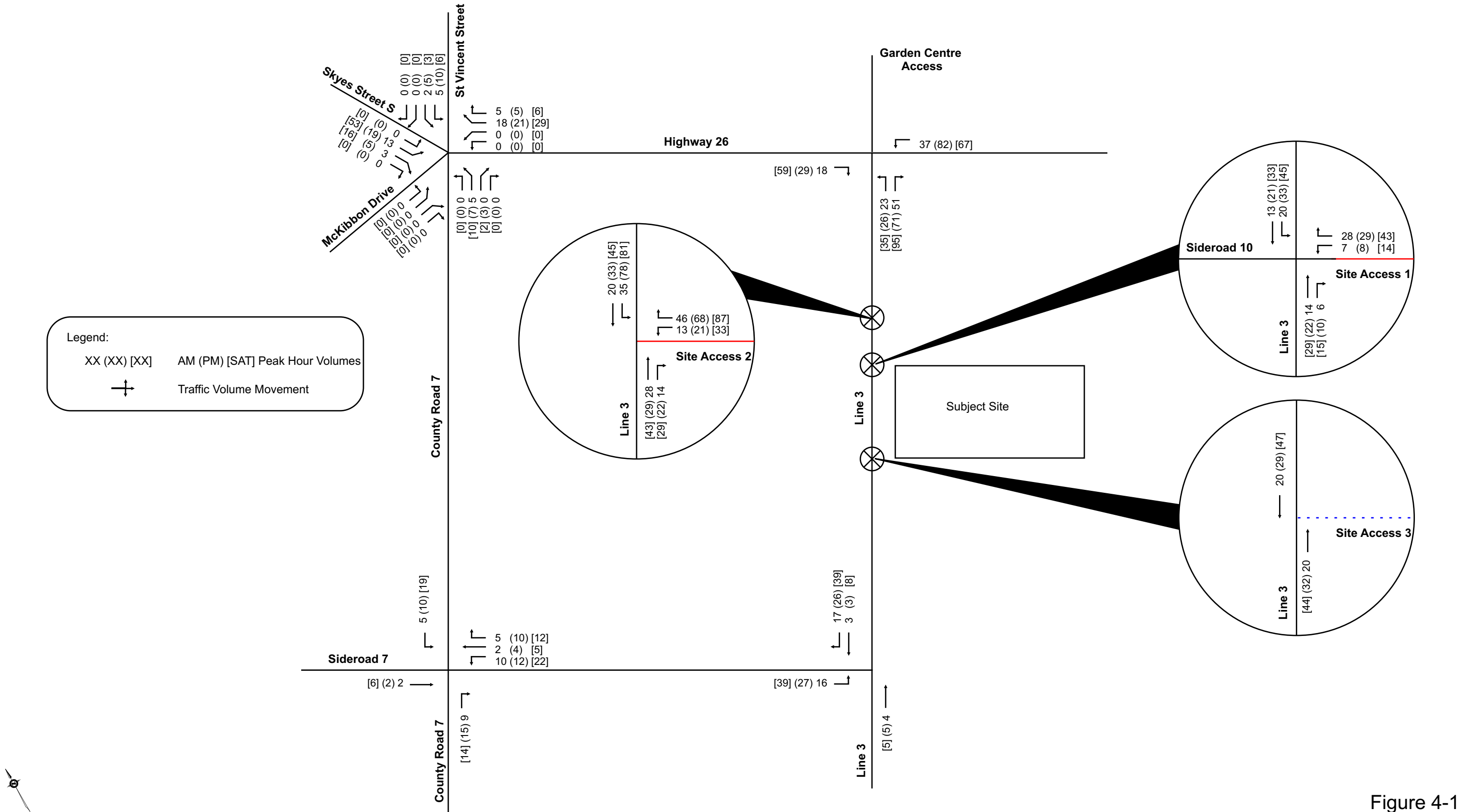


Figure 4-1  
Site Traffic Volumes - Phase 1 (2017)

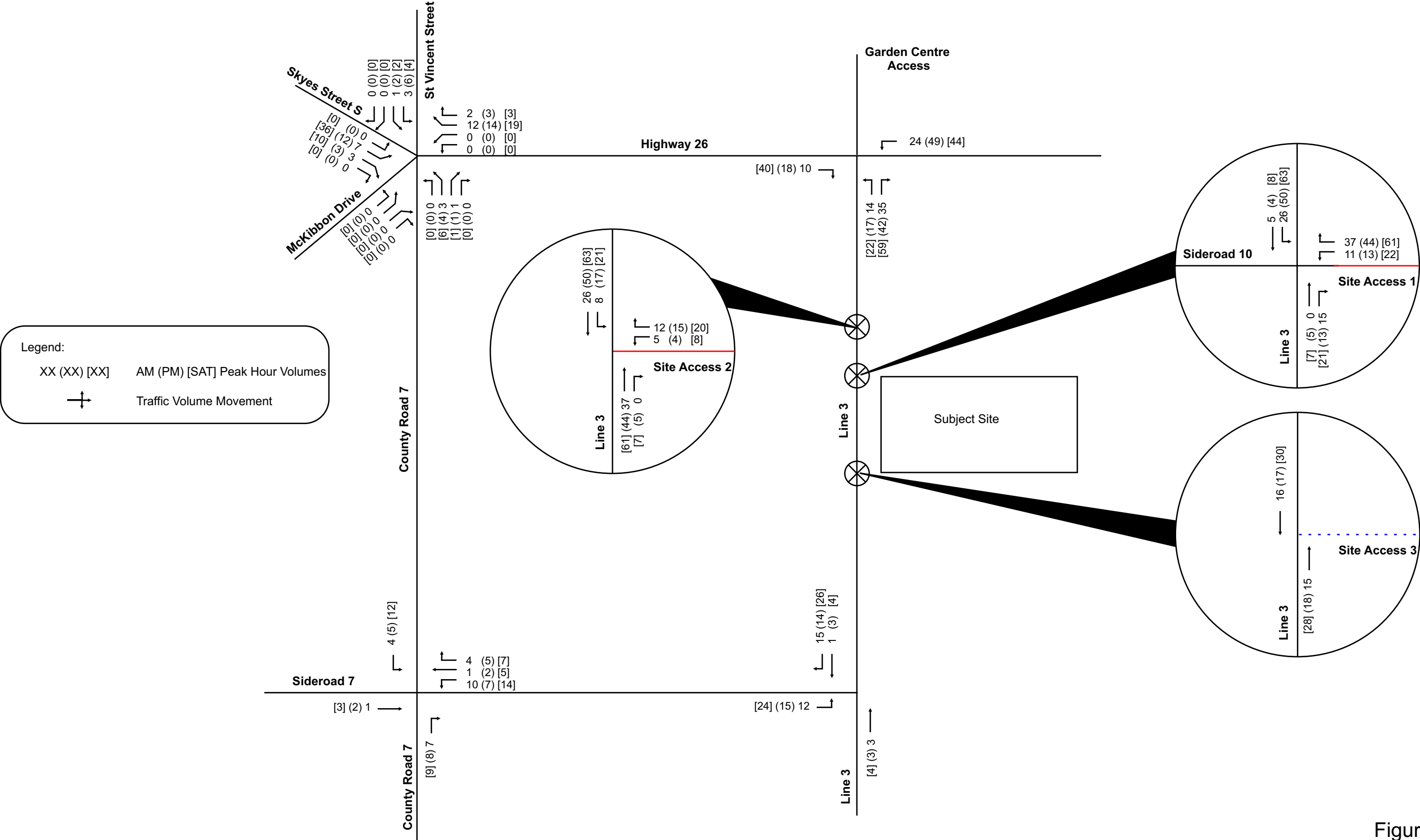


Figure 4-2  
Site Traffic Volumes - Phase 2 (2022)

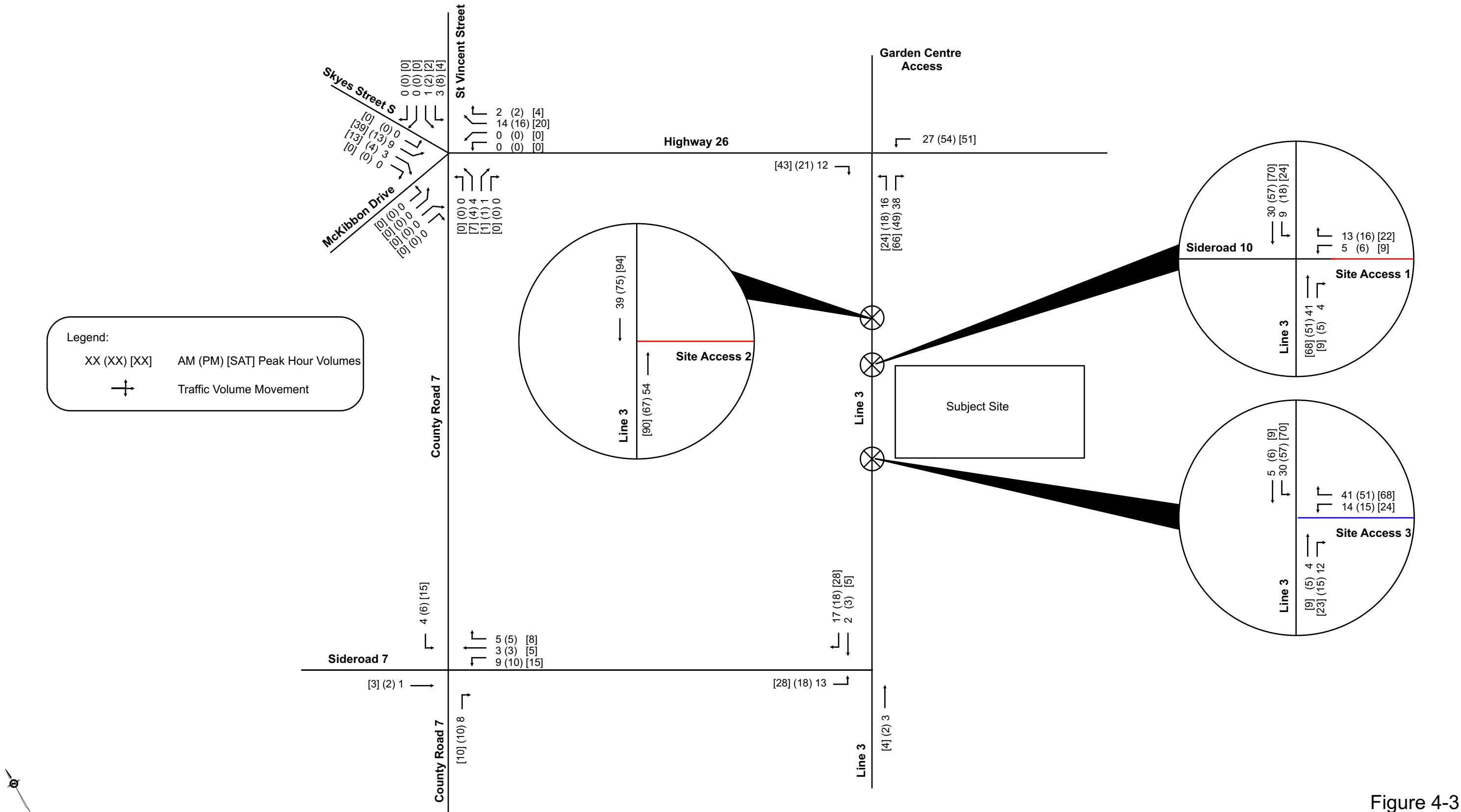
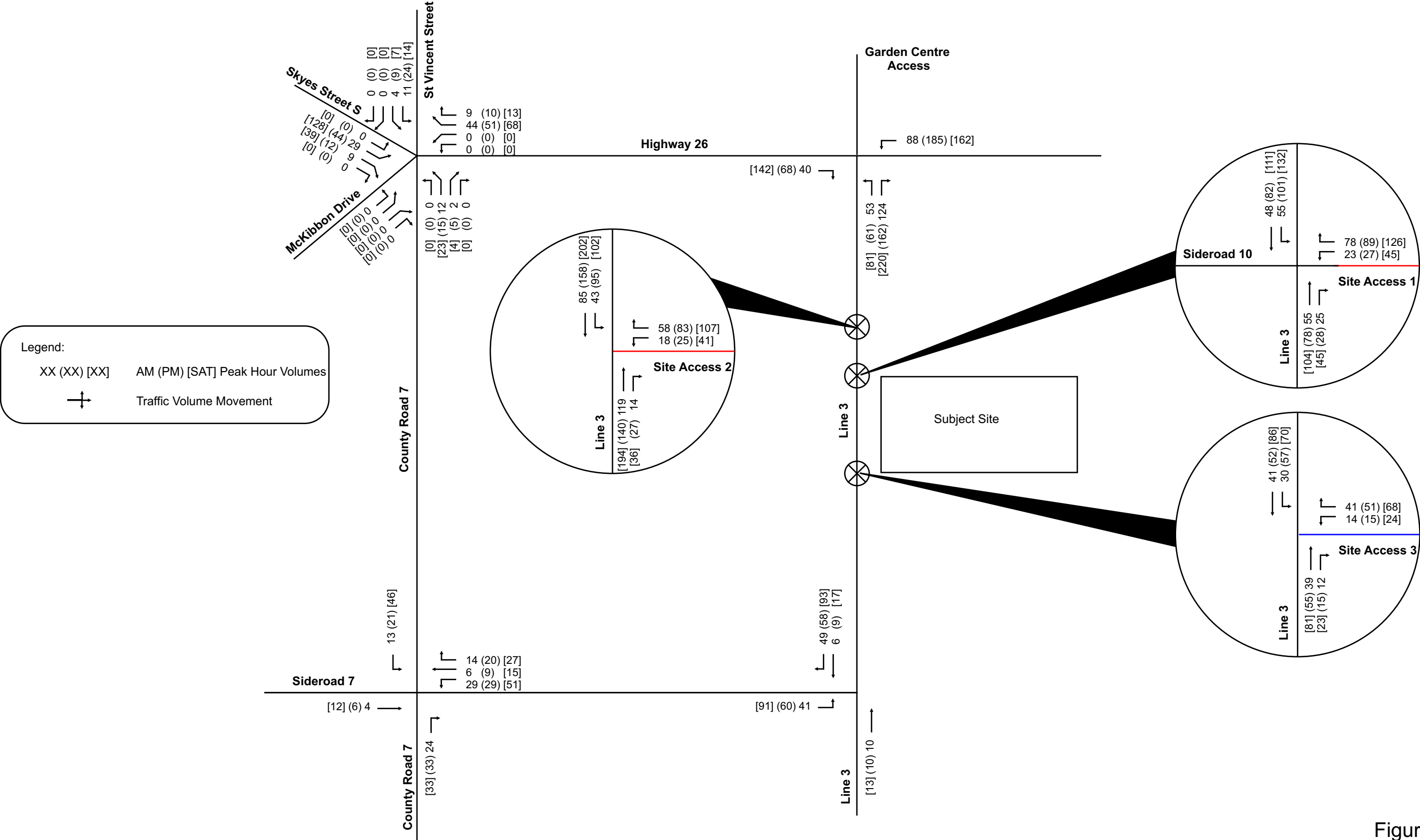


Figure 4-3  
Site Traffic Volumes - Phase 3 (2028)

Figure 4-4  
Total Site Traffic Volumes - "Full Build-Out"

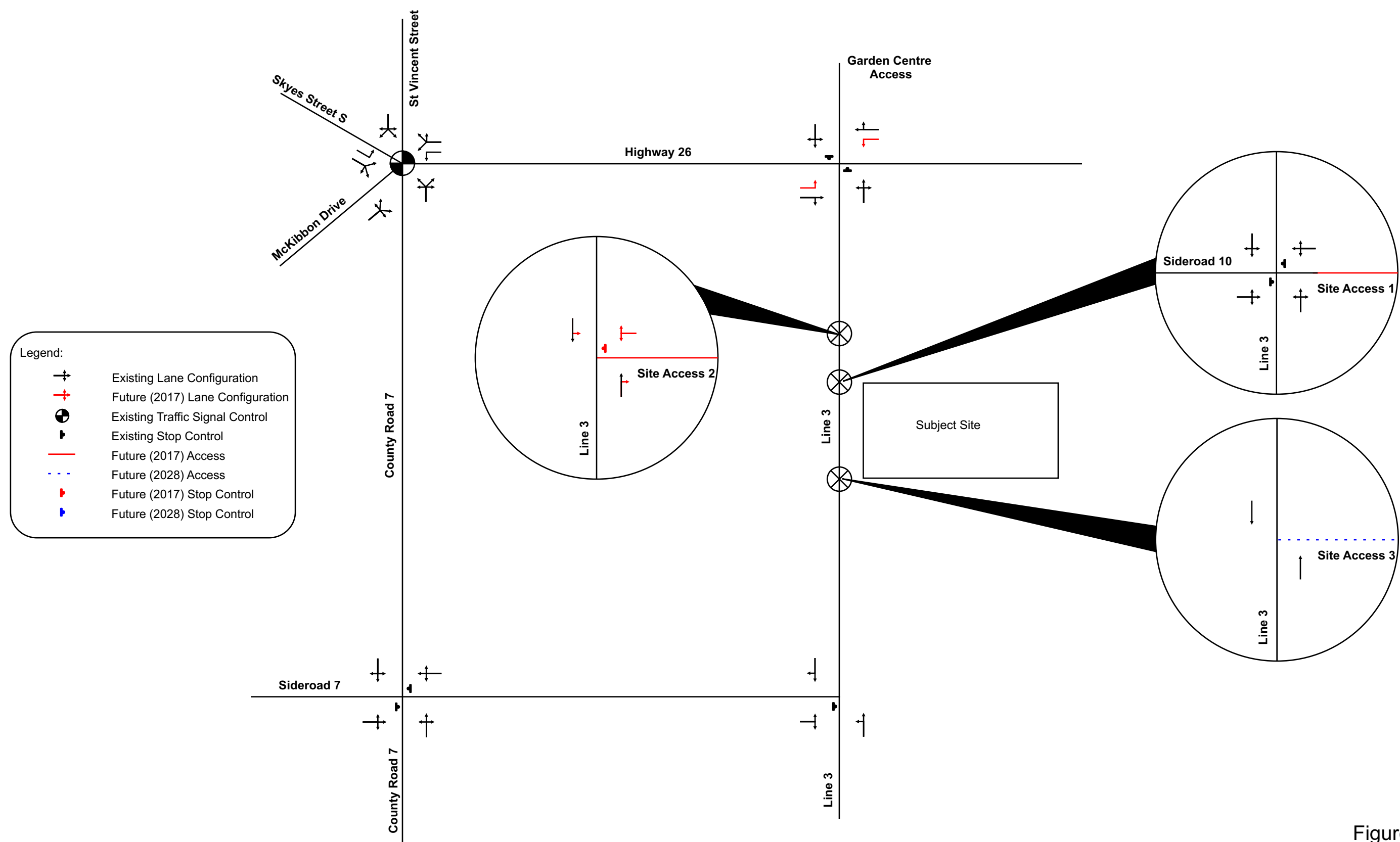


Figure 5-1  
Future (2017) Lane Configuration

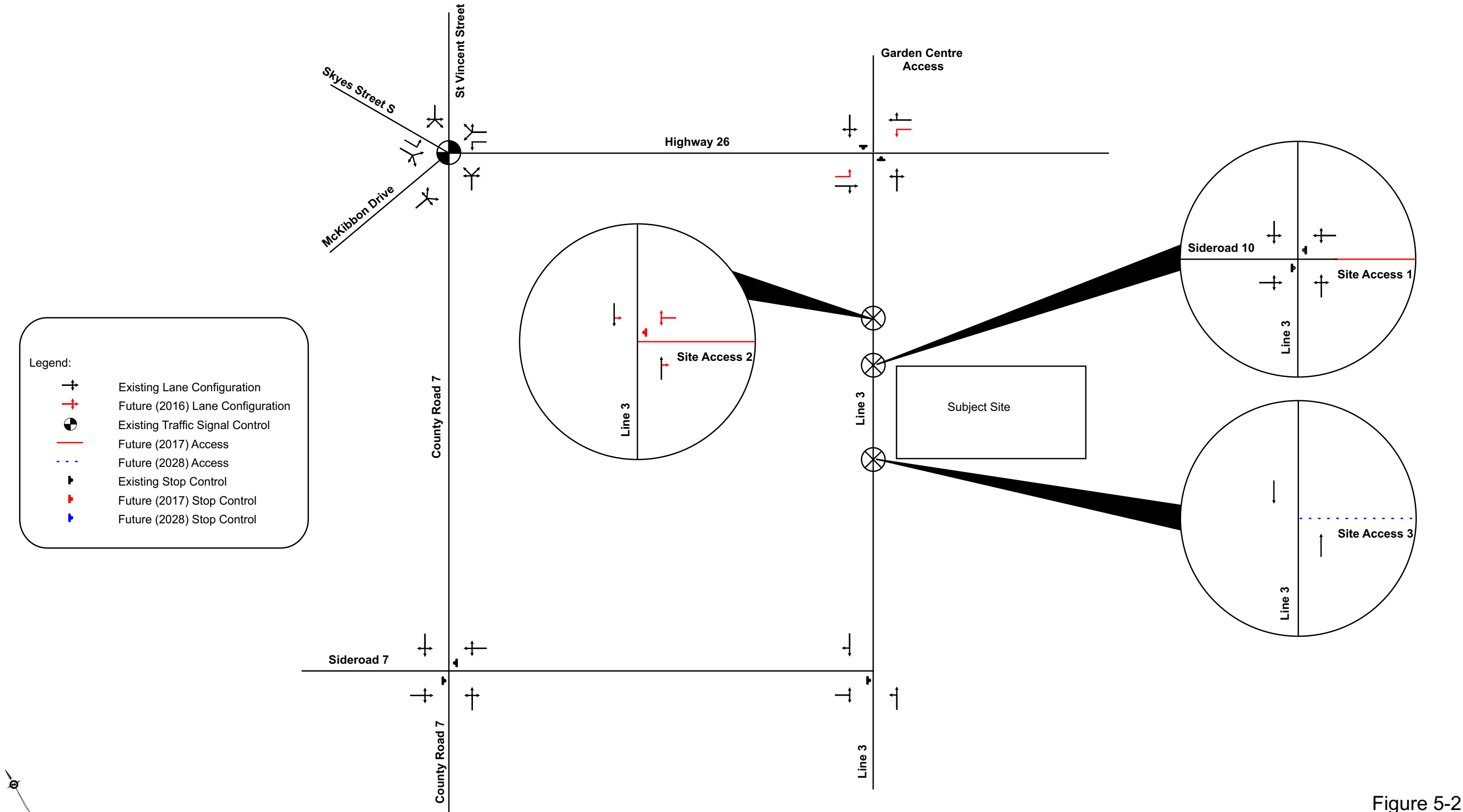


Figure 5-2  
Future (2022) Lane Configuration

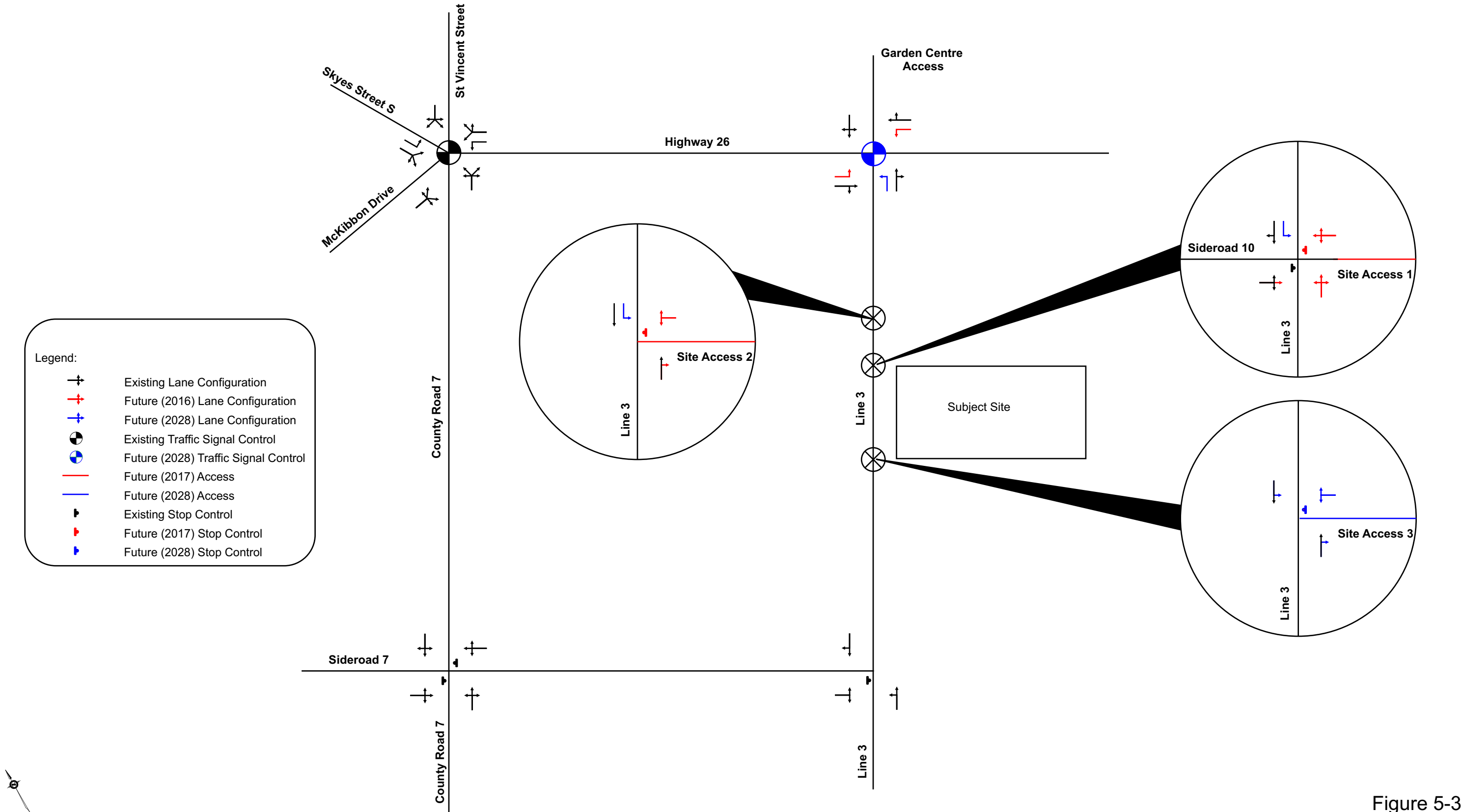


Figure 5-3  
Future (2028) Lane Configuration

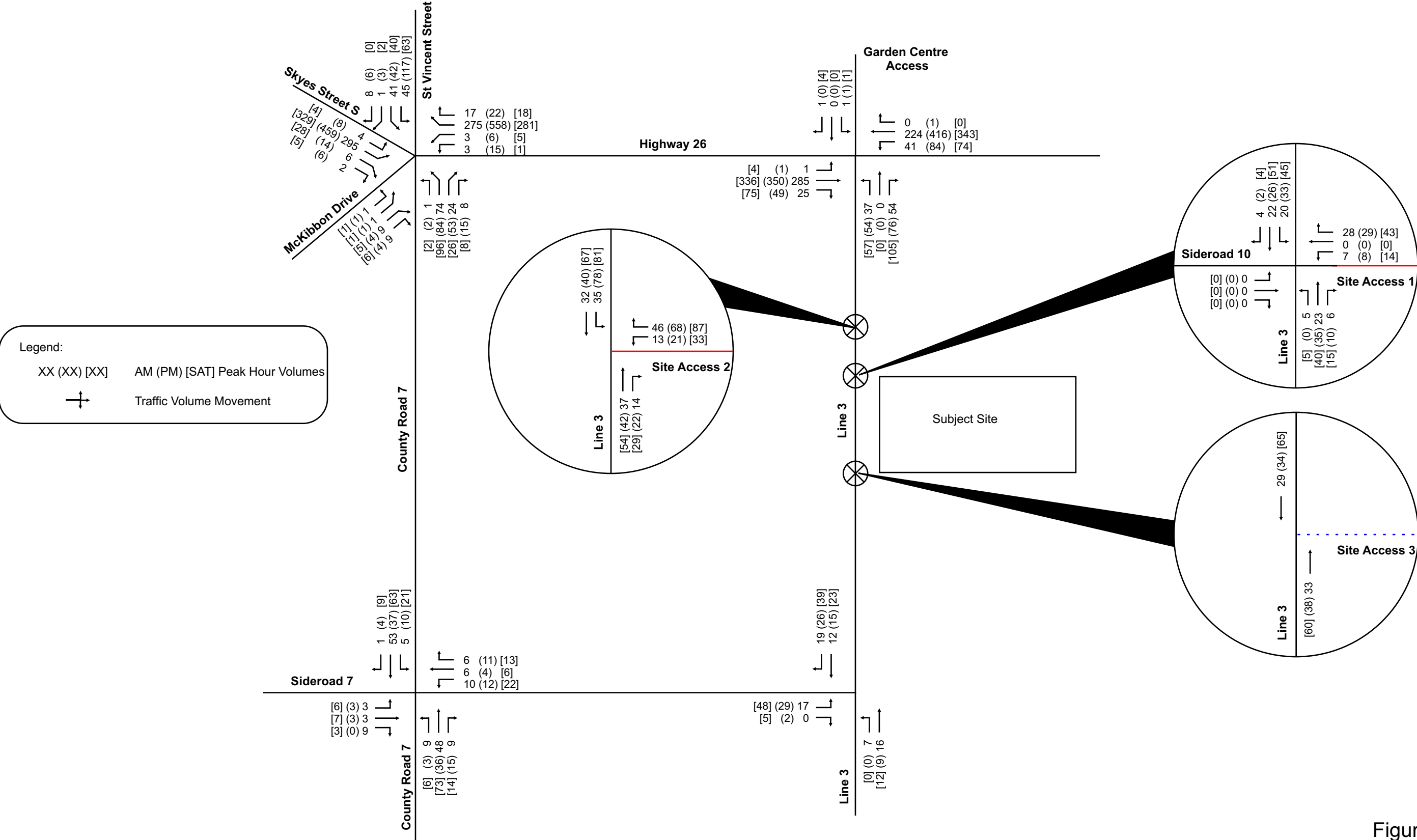


Figure 5-4  
Future (2017) Traffic Volumes



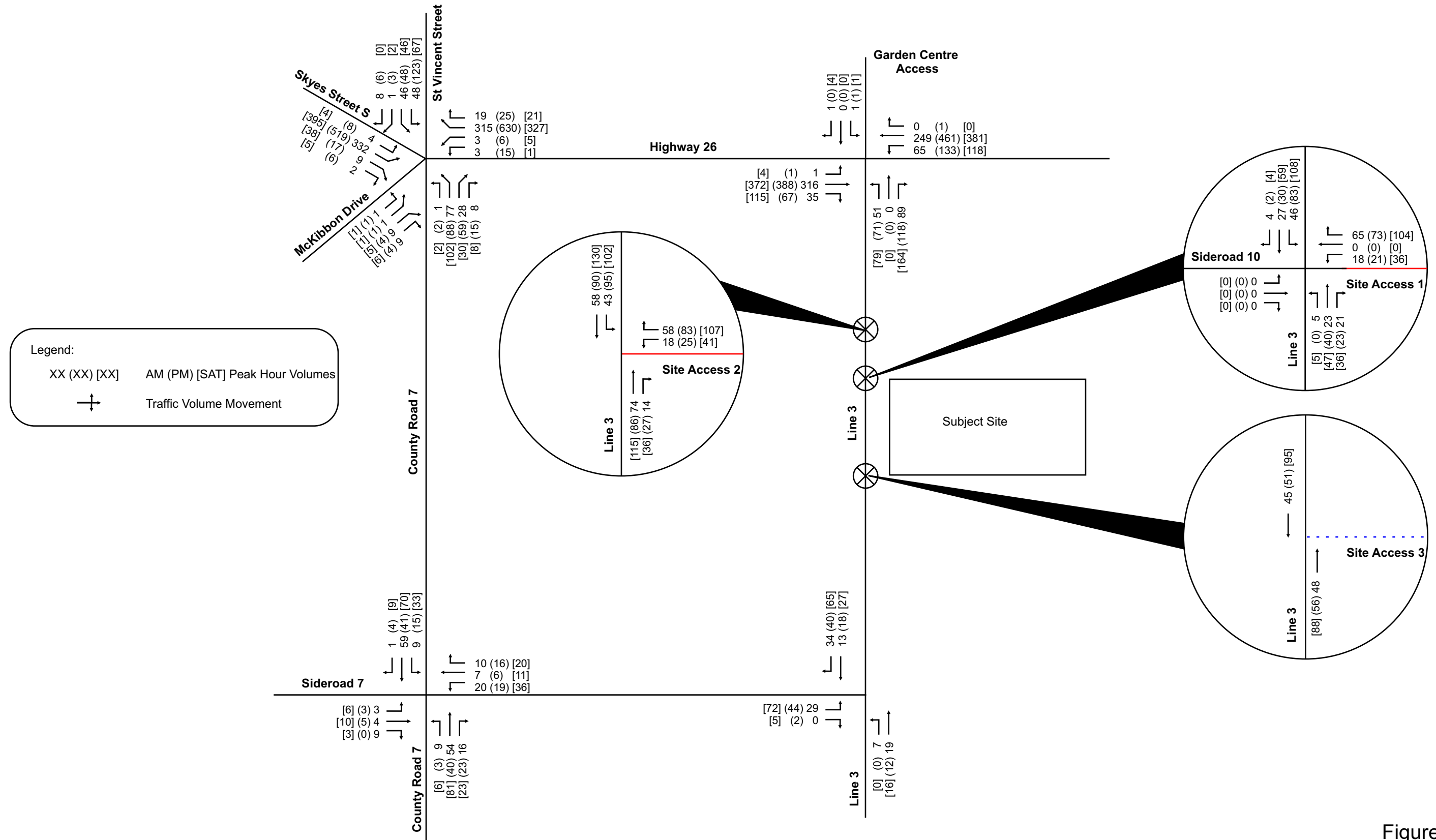


Figure 5-5  
Future (2022) Traffic Volumes

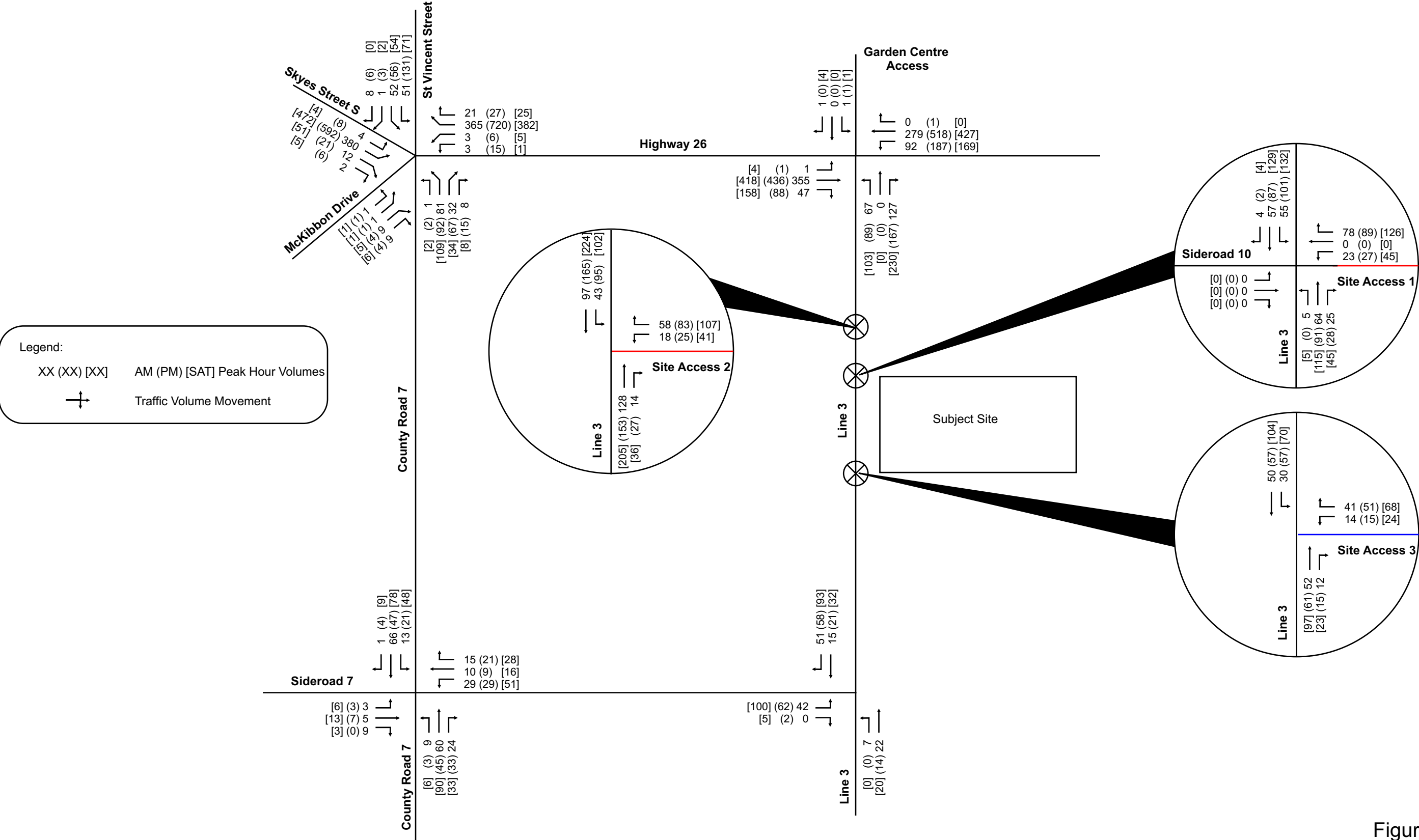


Figure 5-6  
Future (2028) Traffic Volumes

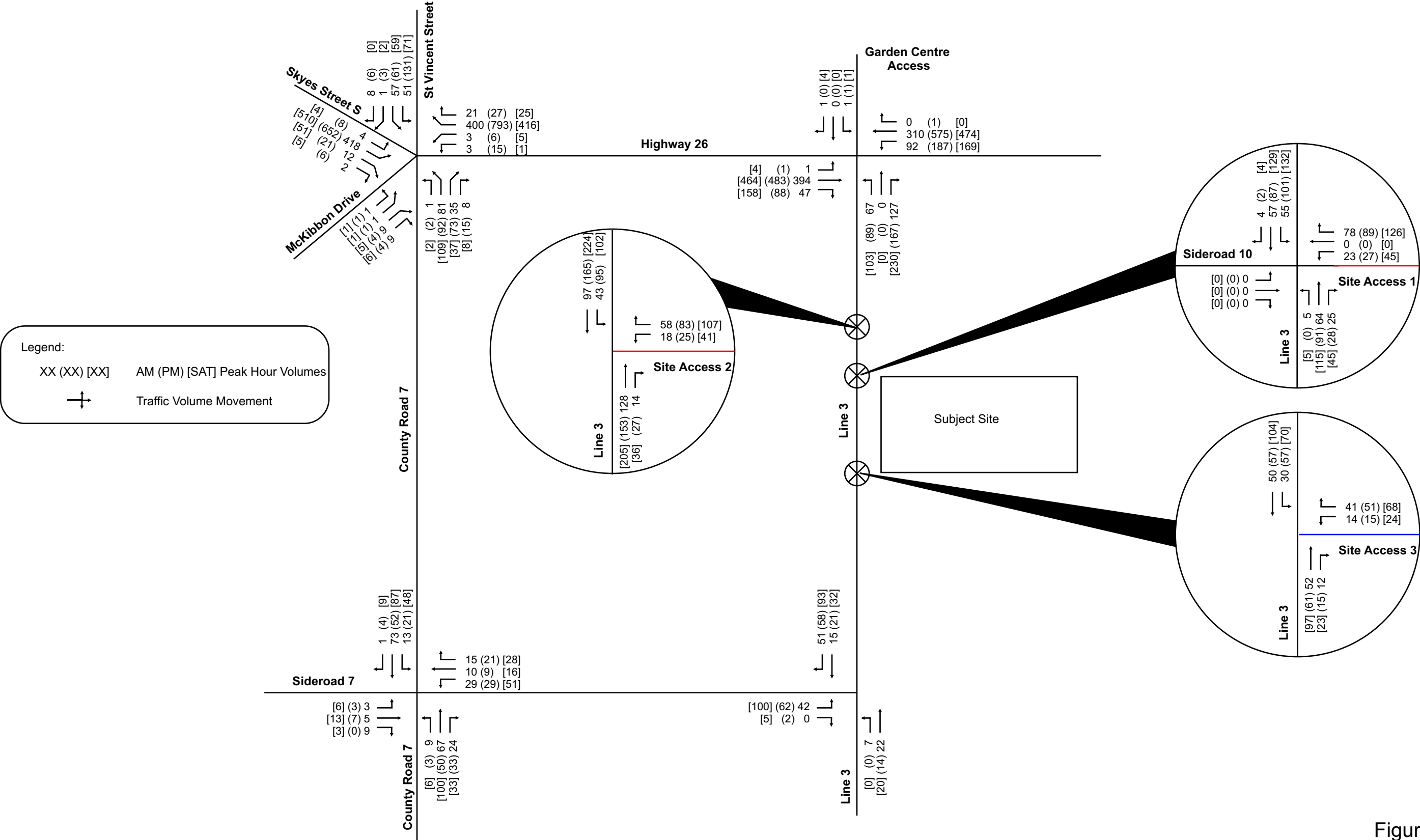


Figure 7-1  
Future (2033) Traffic Volumes

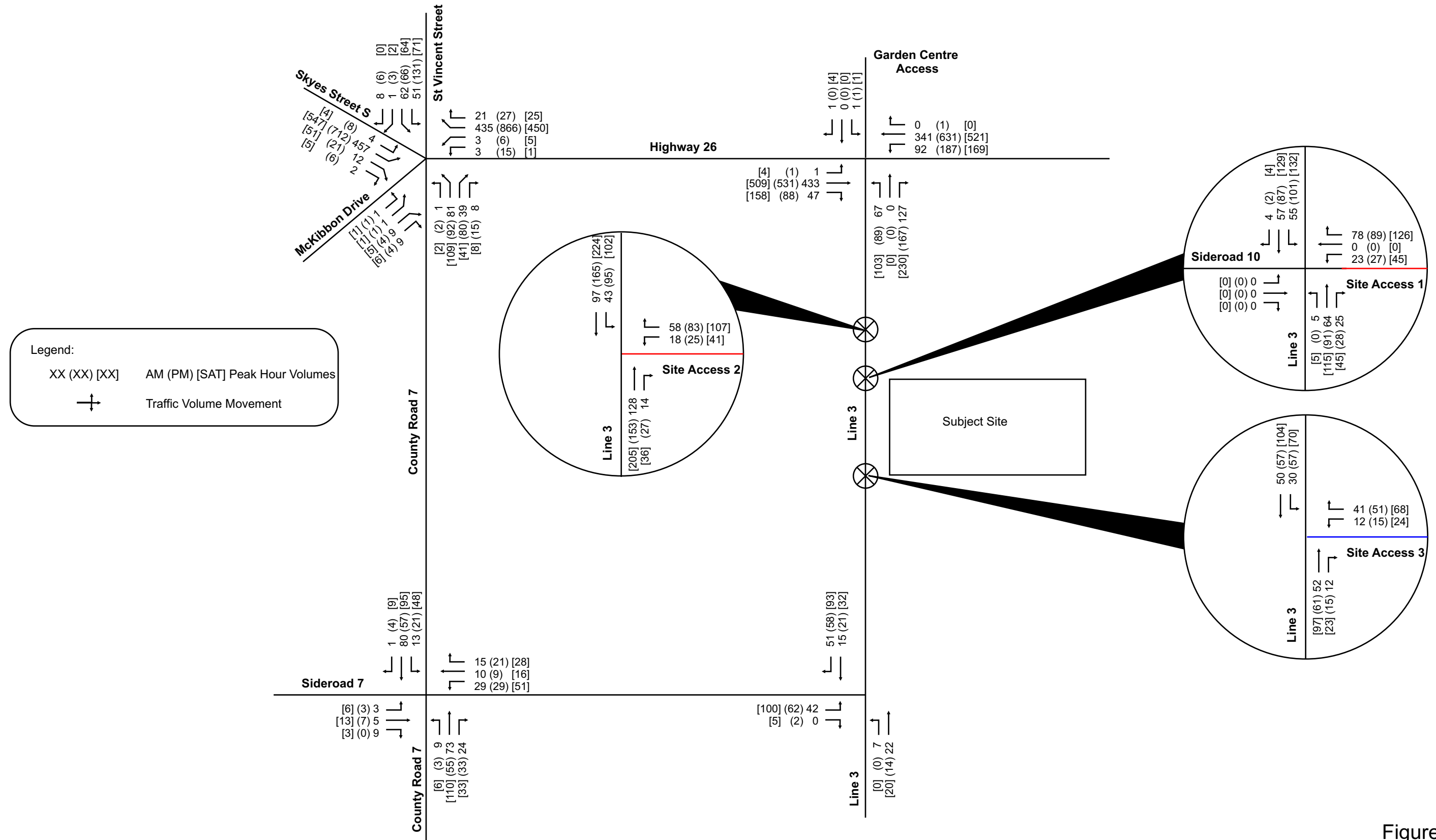


Figure 7-2  
Future (2038) Traffic Volumes

**APPENDIX A**  
**Municipality Of Meaford Official Plan Schedule**



# Municipality of Meaford

## Official Plan

### Schedule C-1

### Transportation



### Legend

- Provincial Highways
- County Roads
- Local Roads
- Seasonal Roads
- Private Roads
- Unassumed Roads
- Unopened Road Allowances
- Federal Lands



Source of Information: County of Grey,  
OMAFRA, Niagara Escarpment Commission,  
GSCA and MNR.



# Municipality of Meaford

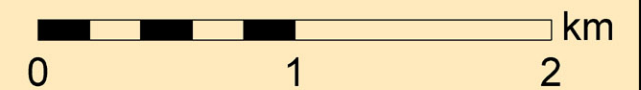
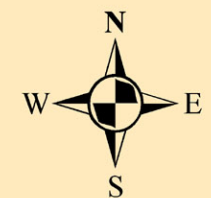
## Official Plan

### Schedule C-2

### Transportation

#### Legend

- Provincial Highways
- County Roads
- Local Roads
- Private Roads
- Unopened Road Allowance



See Schedule C-1

See Schedule C-1

Source of Information: County of Grey,  
OMAFRA, Niagara Escarpment Commission,  
GSCA and MNR.

**APPENDIX B**  
**Existing Traffic Data**



**Intersection:** Highway 26 & St Vincent Street

**Date:** Saturday August 6th, 2011

AM PEAK PERIOD	TOTAL VEHICLES											
	NB			SB			EB			WB		
Interval Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:15 AM	7	5	1	5	3	0	2	45	2	1	42	1
7:30 AM	14	8	3	10	8	0	3	55	3	2	54	3
7:45 AM	12	10	2	11	7	1	1	49	5	1	43	5
8:00 AM	15	10	1	10	11	0	0	55	1	2	49	6
8:15 AM	20	4	4	11	8	4	1	54	0	2	65	2
8:30 AM	15	5	3	7	5	3	2	69	3	0	56	3
8:45 AM	19	3	0	11	10	2	1	73	1	2	59	1
9:00 AM	18	2	2	10	1	2	5	55	0	0	59	2

AM PEAK PERIOD	TOTAL HEAVY VEHICLES											
	NB			SB			EB			WB		
Interval Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:15 AM	2	0	0	0	0	0	1	2	0	0	3	0
7:30 AM	2	0	0	0	0	0	2	4	0	0	4	0
7:45 AM	2	0	0	0	0	0	1	3	0	0	3	0
8:00 AM	0	0	0	0	0	0	0	6	0	0	1	0
8:15 AM	2	0	0	1	0	0	0	5	0	0	3	0
8:30 AM	3	0	0	0	0	0	0	4	0	0	4	0
8:45 AM	1	0	0	0	0	0	0	5	0	0	3	0
9:00 AM	0	0	0	0	0	0	0	3	0	0	5	0

<b>AM PEAK HOUR</b>	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
TOTAL VOLUME	69	22	8	39	34	9	4	251	5	6	229	12
HEAVY VEHICLE %	9%	0%	0%	3%	0%	0%	0%	8%	0%	0%	5%	0%

**Intersection:** Highway 26 & St Vincent Street

**Date:** Friday August 5th, 2011

PM PEAK PERIOD	TOTAL VEHICLES											
	NB			SB			EB			WB		
Interval Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:15 PM	18	6	2	27	5	1	1	101	1	3	104	1
4:30 PM	20	22	3	25	8	1	2	103	1	4	110	4
4:45 PM	22	6	5	30	10	1	3	108	2	5	126	5
5:00 PM	15	10	5	23	10	3	2	80	5	3	138	7
5:15 PM	19	6	2	16	8	0	3	93	6	5	104	8
5:30 PM	12	7	1	14	5	0	4	75	3	1	87	7
5:45 PM	25	10	0	12	8	0	3	61	3	0	99	7
6:00 PM	12	6	0	11	5	0	6	60	2	1	84	3

PM PEAK PERIOD	TOTAL HEAVY VEHICLES											
	NB			SB			EB			WB		
Interval Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	1	0	0
4:45 PM	0	0	0	0	1	0	0	0	0	1	2	0
5:00 PM	0	0	0	0	2	0	0	2	0	1	2	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	2	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	1	0
5:45 PM	0	0	0	0	0	0	0	1	0	0	1	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0

<b>PM PEAK HOUR</b>	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
TOTAL VOLUME	75	44	15	105	33	6	8	392	9	15	478	17
HEAVY VEHICLE %	0%	0%	0%	0%	9%	0%	0%	1%	0%	20%	1%	0%

**Intersection:** Highway 26 & St Vincent Street

**Date:** Saturday August 6th, 2011

SAT PEAK PERIOD	TOTAL VEHICLES											
	NB			SB			EB			WB		
Interval Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
11:15 AM	13	15	1	13	4	0	0	51	5	0	85	5
11:30 AM	16	8	1	12	6	0	1	53	2	0	86	8
11:45 AM	16	6	2	10	5	0	1	70	5	1	89	2
12:00 PM	12	0	2	17	0	1	3	64	7	1	73	3
12:15 PM	23	5	0	12	5	0	0	67	5	6	90	7
12:30 PM	24	3	0	16	0	2	6	82	7	3	79	4
12:45 PM	23	2	0	14	3	0	5	50	1	1	82	5
1:00 PM	18	5	0	13	2	0	2	66	6	1	102	10
1:15 PM	21	11	1	13	2	0	2	68	3	1	101	5
1:30 PM	11	6	0	12	1	0	2	64	4	0	79	5
1:45 PM	9	0	0	15	1	0	3	71	0	0	88	3
2:00 PM	10	1	0	15	0	0	1	57	1	0	68	2
2:15 PM	9	0	0	11	0	0	2	50	1	0	70	1
2:30 PM	9	9	1	12	0	1	1	40	1	0	69	0
2:45 PM	11	8	0	11	1	0	1	45	2	1	66	3
3:00 PM	10	9	0	10	0	0	1	43	2	0	66	1

SAT PEAK PERIOD	TOTAL HEAVY VEHICLES											
	NB			SB			EB			WB		
Interval Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	1	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	1	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	1	1	0	0	2
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	2	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	1	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0

SAT PEAK HOUR	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
TOTAL VOLUME	86	21	1	56	7	2	15	266	17	6	364	24
HEAVY VEHICLE %	1%	0%	0%	0%	0%	0%	0%	0%	6%	0%	0%	8%

**Intersection:** Highway 26 & 3rd Line (Garden Street Access)

**Date:** Friday August 5th, 2011

AM PEAK PERIOD	TOTAL VEHICLES											
	NB			SB			EB			WB		
Interval Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:15 AM	2	0	0	0	0	1	1	69	0	0	70	0
7:30 AM	2	0	0	0	0	0	0	64	3	2	41	0
7:45 AM	4	0	0	0	0	0	0	50	3	0	38	0
8:00 AM	6	0	3	1	0	0	0	71	1	2	51	0
8:15 AM	5	0	0	0	0	0	1	52	7	1	43	0
8:30 AM	3	0	2	0	0	1	0	59	4	0	47	0
8:45 AM	8	0	0	0	0	0	0	65	3	0	53	0
9:00 AM	6	0	0	1	0	0	0	69	4	0	56	0

AM PEAK PERIOD	TOTAL HEAVY VEHICLES											
	NB			SB			EB			WB		
Interval Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:15 AM	0	0	0	0	0	0	0	3	0	0	10	0
7:30 AM	0	0	0	0	0	0	0	4	0	0	1	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	2	0
8:00 AM	0	0	0	0	0	0	0	6	0	0	2	0
8:15 AM	0	0	0	0	0	0	0	4	0	0	2	0
8:30 AM	1	0	0	0	0	0	0	10	0	0	3	0
8:45 AM	0	0	0	0	0	0	0	0	1	0	5	0
9:00 AM	0	0	0	0	0	0	0	3	0	0	3	0

<b>AM PEAK HOUR</b>	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
TOTAL VOLUME	14	0	3	1	0	1	1	254	7	4	200	0
HEAVY VEHICLE %	0%		0%	0%		0%	0%	5%	0%	0%	8%	

**Intersection:** Highway 26 & 3rd Line (Garden Street Access)

**Date:** Friday August 5th, 2011

PM PEAK PERIOD	TOTAL VEHICLES											
	NB			SB			EB			WB		
Interval Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:15 PM	6	0	1	1	0	0	0	73	3	1	76	0
4:30 PM	9	0	1	0	0	0	1	81	2	0	80	0
4:45 PM	6	0	3	0	0	0	0	81	7	0	97	0
5:00 PM	6	0	0	0	0	0	0	77	8	1	118	1
5:15 PM	2	0	2	2	0	0	2	75	8	1	96	0
5:30 PM	5	0	0	0	0	0	0	64	7	1	79	0
5:45 PM	2	0	2	0	1	1	0	59	6	3	97	0
6:00 PM	6	0	2	0	0	0	0	87	3	0	59	0

PM PEAK PERIOD	TOTAL HEAVY VEHICLES											
	NB			SB			EB			WB		
Interval Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	1	0	0	2	0
4:45 PM	0	0	0	0	0	0	0	3	0	0	6	0
5:00 PM	0	0	0	0	0	0	0	1	0	0	3	0
5:15 PM	0	0	0	0	0	0	0	1	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	1	0	0	1	0
5:45 PM	0	0	0	0	0	0	0	1	0	0	0	0
6:00 PM	0	0	1	0	0	0	0	0	0	0	2	0

<b>PM PEAK HOUR</b>	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
TOTAL VOLUME	27	0	5	1	0	0	1	312	20	2	371	1
HEAVY VEHICLE %	0%		0%	0%			0%	2%	0%	0%	3%	0%

**Intersection:** Highway 26 & 3rd Line (Garden Street Access)

**Date:** Saturday August 6th, 2011

SAT PEAK PERIOD	TOTAL VEHICLES											
	NB			SB			EB			WB		
Interval Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
11:15 AM	6	0	5	2	0	0	2	68	7	1	71	1
11:30 AM	5	1	2	3	0	2	1	74	2	4	68	1
11:45 AM	11	0	0	0	0	1	2	70	4	3	82	0
12:00 PM	5	0	6	1	0	2	1	77	6	3	59	0
12:15 PM	4	0	2	0	0	1	0	67	4	0	80	0
12:30 PM	2	0	2	0	0	0	1	85	2	1	85	0
12:45 PM	2	1	0	0	1	1	2	70	2	1	72	1
1:00 PM	5	0	1	0	0	2	0	80	3	1	84	0
1:15 PM	3	0	1	0	0	0	1	67	4	0	69	0
1:30 PM	2	0	1	0	0	1	0	68	8	1	86	0
1:45 PM	7	0	0	1	1	0	0	60	2	3	72	1
2:00 PM	6	1	0	0	0	0	0	70	0	1	80	0
2:15 PM	5	0	1	0	0	0	0	59	5	1	92	0
2:30 PM	2	0	0	0	0	0	1	55	0	0	66	1
2:45 PM	4	1	0	1	0	0	0	60	1	0	70	0
3:00 PM	3	0	1	0	0	1	0	52	1	1	68	0

SAT PEAK PERIOD	TOTAL HEAVY VEHICLES											
	NB			SB			EB			WB		
Interval Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
11:15 AM	0	0	0	0	0	0	0	0	0	0	1	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	1	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	2	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	1	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	1	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	1	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	2	0
2:15 PM	0	0	0	0	0	0	0	1	0	0	1	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0

SAT PEAK HOUR	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
TOTAL VOLUME	22	0	10	1	0	4	4	299	16	7	306	0
HEAVY VEHICLE %	0%		0%	0%		0%	0%	0%	0%	0%	1%	

**Intersection:**     **3rd Line and Sideroad 10**

**Date:**                **Friday August 5th, 2011**

AM PEAK PERIOD	TOTAL VEHICLES											
	NB			SB			EB			WB		
Interval Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:15 AM	0	1	0	0	3	1	0	0	0	0	0	0
7:30 AM	0	0	0	0	4	0	0	0	0	0	0	0
7:45 AM	0	1	0	0	4	1	0	0	0	0	0	0
8:00 AM	0	2	0	0	2	0	0	0	0	0	0	0
8:15 AM	1	0	0	0	2	1	0	0	0	0	0	0
8:30 AM	2	1	0	0	5	1	0	0	0	0	0	0
8:45 AM	0	2	0	0	1	0	0	0	0	0	0	0
9:00 AM	2	6	0	0	1	2	0	0	0	0	0	0

AM PEAK PERIOD	TOTAL HEAVY VEHICLES											
	NB			SB			EB			WB		
Interval Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0

<b>AM PEAK HOUR</b>	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
TOTAL VOLUME	5	9	0	0	9	4	0	0	0	0	0	0
HEAVY VEHICLE %	0%	0%			0%	0%						

**Intersection:**     **3rd Line and Sideroad 10**

**Date:**                **Friday August 5th, 2011**

PM PEAK PERIOD	TOTAL VEHICLES											
	NB			SB			EB			WB		
Interval Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:15 PM	0	1	0	0	4	1	0	0	0	0	0	0
4:30 PM	0	1	0	0	4	1	0	0	0	0	0	0
4:45 PM	0	1	0	0	5	0	0	0	0	0	0	0
5:00 PM	0	2	0	0	2	2	0	0	0	0	0	0
5:15 PM	0	1	0	0	1	0	0	0	0	0	0	0
5:30 PM	0	3	0	0	2	1	0	0	0	0	0	0
5:45 PM	0	4	0	0	1	0	0	0	0	0	0	0
6:00 PM	0	5	0	0	1	1	0	0	0	0	0	0

PM PEAK PERIOD	TOTAL HEAVY VEHICLES											
	NB			SB			EB			WB		
Interval Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0

<b>PM PEAK HOUR</b>	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
TOTAL VOLUME	0	13	0	0	5	2	0	0	0	0	0	0
HEAVY VEHICLE %		0%			0%	0%						



**Intersection:** 3rd Line and Sideroad 10  
**Date:** Saturday August 6th, 2011

SAT PEAK PERIOD	TOTAL VEHICLES											
	NB			SB			EB			WB		
Interval Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
11:15 AM	1	2	0	0	3	1	0	0	0	0	0	0
11:30 AM	0	1	0	0	4	0	0	0	0	0	0	0
11:45 AM	2	3	0	0	4	0	0	0	0	0	0	0
12:00 PM	1	1	0	0	5	1	0	0	0	0	0	0
12:15 PM	1	4	0	0	3	1	0	0	0	0	0	0
12:30 PM	1	3	0	0	6	2	0	0	0	0	0	0
12:45 PM	0	2	0	0	3	0	0	0	0	0	0	0
1:00 PM	0	5	0	0	2	2	0	0	0	0	0	0
1:15 PM	0	2	0	0	4	1	0	0	0	0	0	0
1:30 PM	2	0	0	0	3	1	0	0	0	0	0	0
1:45 PM	1	1	0	0	5	2	0	0	0	0	0	0
2:00 PM	0	1	0	0	2	2	0	0	0	0	0	0
2:15 PM	0	0	0	0	2	1	0	0	0	0	0	0
2:30 PM	1	0	0	0	1	0	0	0	0	0	0	0
2:45 PM	0	1	0	0	0	1	0	0	0	0	0	0
3:00 PM	0	0	0	0	1	0	0	0	0	0	0	0

SAT PEAK PERIOD	TOTAL HEAVY VEHICLES											
	NB			SB			EB			WB		
Interval Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0

SAT PEAK HOUR	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
TOTAL VOLUME	5	11	0	0	18	4	0	0	0	0	0	0
HEAVY VEHICLE %	0%	0%			0%	0%						

**Intersection:** 3rd Line and Sideroad 7

**Date:** Friday August 5th, 2011

AM PEAK PERIOD	TOTAL VEHICLES											
	NB			SB			EB			WB		
Interval Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:15 AM	0	1	0	0	4	1	0	0	0	0	0	0
7:30 AM	0	0	0	0	4	1	0	0	0	0	0	0
7:45 AM	0	1	0	0	5	2	0	0	0	0	0	0
8:00 AM	0	1	0	0	2	1	0	0	0	0	0	0
8:15 AM	1	2	0	0	2	1	0	0	0	0	0	0
8:30 AM	2	3	0	0	5	0	0	0	0	0	0	0
8:45 AM	0	2	0	0	1	0	1	0	0	0	0	0
9:00 AM	4	5	0	0	1	1	0	2	0	0	0	0

AM PEAK PERIOD	TOTAL HEAVY VEHICLES											
	NB			SB			EB			WB		
Interval Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0

<b>AM PEAK HOUR</b>	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
TOTAL VOLUME	7	12	0	0	9	2	1	2	0	0	0	0
HEAVY VEHICLE %	0%	0%			0%	0%						

**Intersection:** 3rd Line and Sideroad 7

**Date:** Friday August 5th, 2011

PM PEAK PERIOD	TOTAL VEHICLES											
	NB			SB			EB			WB		
Interval Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:15 PM	0	2	2	0	4	0	1	0	1	0	0	0
4:30 PM	0	1	1	1	5	0	1	0	2	0	0	0
4:45 PM	0	3	3	1	10	0	0	0	2	0	0	0
5:00 PM	0	1	2	0	4	0	0	0	1	0	0	0
5:15 PM	0	2	0	2	2	0	0	0	1	0	0	0
5:30 PM	0	2	4	0	6	0	1	0	1	0	0	0
5:45 PM	0	0	1	1	2	0	1	0	0	0	0	0
6:00 PM	0	0	2	0	3	0	0	0	0	0	0	0

PM PEAK PERIOD	TOTAL HEAVY VEHICLES											
	NB			SB			EB			WB		
Interval Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0

<b>PM PEAK HOUR</b>	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
TOTAL VOLUME	0	4	7	3	13	0	2	0	2	0	0	0
HEAVY VEHICLE %	#DIV/0!	0%			0%	#DIV/0!						

**Intersection:** 3rd Line and Sideroad 7  
**Date:** Saturday August 6th, 2011

SAT PEAK PERIOD	TOTAL VEHICLES											
	NB			SB			EB			WB		
Interval Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
11:15 AM	0	3	3	1	3	0	2	0	1	0	0	0
11:30 AM	0	3	2	5	2	0	1	0	2	0	0	0
11:45 AM	0	3	2	2	3	0	4	0	1	0	0	0
12:00 PM	0	2	4	2	4	0	2	0	3	0	0	0
12:15 PM	0	1	1	0	4	0	3	0	0	0	0	0
12:30 PM	0	1	0	1	4	0	0	0	1	0	0	0
12:45 PM	0	4	2	2	2	0	1	0	0	0	0	0
1:00 PM	0	1	1	0	4	0	1	0	0	0	0	0
1:15 PM	0	4	1	0	2	0	1	0	2	0	0	0
1:30 PM	0	2	1	1	2	0	3	0	0	0	0	0
1:45 PM	0	3	2	1	0	0	3	0	0	0	0	0
2:00 PM	0	2	1	0	4	0	1	0	1	0	0	0
2:15 PM	0	4	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	1	0	0	2	0	0	0	0	0	0	0
2:45 PM	0	2	1	1	0	0	1	0	0	0	0	0
3:00 PM	0	1	0	0	0	0	0	0	0	0	0	0

SAT PEAK PERIOD	TOTAL HEAVY VEHICLES											
	NB			SB			EB			WB		
Interval Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
1:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
1:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
1:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0

SAT PEAK HOUR	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
TOTAL VOLUME	0	7	7	5	15	0	9	0	5	0	0	0
HEAVY VEHICLE %	#DIV/0!	0%			0%	#DIV/0!						

**Intersection:** County Road 7 - Sideroad 7

**Date:** Friday August 5th, 2011

AM PEAK PERIOD	TOTAL VEHICLES											
	NB			SB			EB			WB		
Interval Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:15 AM	0	6	0	0	4	0	1	0	1	0	1	0
7:30 AM	7	9	0	0	4	0	0	0	2	0	0	0
7:45 AM	2	2	0	1	10	0	0	0	5	0	0	0
8:00 AM	2	10	0	0	11	0	0	0	3	0	0	0
8:15 AM	3	10	0	0	10	1	0	0	2	0	2	1
8:30 AM	2	15	0	0	10	0	1	0	1	0	2	0
8:45 AM	2	8	0	0	16	0	2	1	3	0	0	0
9:00 AM	1	12	0	1	7	0	0	1	3	0	1	0

AM PEAK PERIOD	TOTAL HEAVY VEHICLES											
	NB			SB			EB			WB		
Interval Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	3	1	0	0	0	0	0	0	1	0	0	0
7:45 AM	0	2	0	1	0	0	0	0	2	0	0	0
8:00 AM	0	1	0	0	1	0	0	0	0	0	0	0
8:15 AM	0	2	0	0	2	0	0	0	1	0	0	0
8:30 AM	0	3	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	1	0	0	0	0	0	0	1	0	0	0
9:00 AM	0	0	0	0	1	0	0	0	0	0	0	0

<b>AM PEAK HOUR</b>	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
TOTAL VOLUME	9	43	0	0	47	1	3	1	9	0	4	1
HEAVY VEHICLE %	0%	16%	0%	0%	6%	0%	0%	0%	22%	0%	0%	0%

Date: Friday August 5th, 2011

PM PEAK PERIOD	TOTAL HEAVY VEHICLES											
	NB			SB			EB			WB		
Interval Time	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	1	0	2	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	1	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0

[illegible]

Date: Saturday August 6th, 2011

[illegible][illegible][illegible]

















**APPENDIX C**  
**Existing Traffic Conditions Analysis Outputs**  
Level of Service Calculations



# HCM Signalized Intersection Capacity Analysis

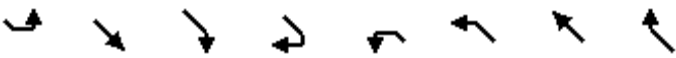




Existing AM

## 1: Highway 26-McKibbin Drive & St Vincent Street-County Road 7

												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SBR2
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0		4.0		
Lane Util. Factor		1.00					1.00	1.00		1.00		
Frt		0.88					1.00	0.85		0.99		
Flt Protected		1.00					0.96	1.00		0.98		
Satd. Flow (prot)		1678					1734	1633		1823		
Flt Permitted		0.97					0.77	1.00		0.86		
Satd. Flow (perm)		1628					1389	1633		1610		
Volume (vph)	1	1	9	9	1	69	22	8	40	35	1	8
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	10	10	1	75	24	9	43	38	1	9
RTOR Reduction (vph)	0	9	0	0	0	0	0	4	0	3	0	0
Lane Group Flow (vph)	0	13	0	0	0	0	100	5	0	89	0	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	9%	0%	0%	3%	0%	0%	0%
Turn Type	Perm				Perm		Perm	Perm	Perm	Perm		
Protected Phases		9					2				6	
Permitted Phases	9				2	2		2	6			
Actuated Green, G (s)		2.9					50.5	50.5		50.5		
Effective Green, g (s)		4.9					52.5	52.5		52.5		
Actuated g/C Ratio		0.05					0.58	0.58		0.58		
Clearance Time (s)		6.0					6.0	6.0		6.0		
Vehicle Extension (s)		3.0					3.0	3.0		3.0		
Lane Grp Cap (vph)		89					810	953		939		
v/s Ratio Prot												
v/s Ratio Perm		c0.01					c0.07	0.00		0.05		
v/c Ratio		0.14					0.12	0.01		0.09		
Uniform Delay, d1		40.5					8.4	7.8		8.3		
Progression Factor		1.00					1.00	1.00		1.00		
Incremental Delay, d2		0.7					0.3	0.0		0.2		
Delay (s)		41.3					8.7	7.8		8.5		
Level of Service		D					A	A		A		
Approach Delay (s)		41.3					8.7			8.5		
Approach LOS		D					A			A		
Intersection Summary												
HCM Average Control Delay		28.8					HCM Level of Service			C		
HCM Volume to Capacity ratio		0.28										
Actuated Cycle Length (s)		90.0					Sum of lost time (s)			12.0		
Intersection Capacity Utilization		38.4%					ICU Level of Service			A		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
1: Highway 26-McKibbin Drive & St Vincent Street-County Road 7

Existing AM

								
Movement	SEL	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations								
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	1.00				1.00	1.00	
Frt	1.00	1.00				1.00	0.99	
Flt Protected	0.95	1.00				0.95	1.00	
Satd. Flow (prot)	1825	1776				1825	1820	
Flt Permitted	0.36	1.00				0.33	1.00	
Satd. Flow (perm)	694	1776				637	1820	
Volume (vph)	4	256	3	2	3	3	234	12
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	278	3	2	3	3	254	13
RTOR Reduction (vph)	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	4	283	0	0	0	6	265	0
Heavy Vehicles (%)	0%	8%	0%	0%	0%	0%	5%	0%
Turn Type	Perm				Perm		Perm	
Protected Phases		4					8	
Permitted Phases	4				8	8		
Actuated Green, G (s)	18.6	18.6				18.6	18.6	
Effective Green, g (s)	20.6	20.6				20.6	20.6	
Actuated g/C Ratio	0.23	0.23				0.23	0.23	
Clearance Time (s)	6.0	6.0				6.0	6.0	
Vehicle Extension (s)	3.0	3.0				3.0	3.0	
Lane Grp Cap (vph)	159	407				146	417	
v/s Ratio Prot		c0.16					0.15	
v/s Ratio Perm	0.01					0.01		
v/c Ratio	0.03	0.70				0.04	0.63	
Uniform Delay, d1	26.9	31.8				27.0	31.3	
Progression Factor	1.00	1.00				1.00	1.00	
Incremental Delay, d2	0.1	5.1				0.1	3.2	
Delay (s)	27.0	36.9				27.1	34.5	
Level of Service	C	D				C	C	
Approach Delay (s)		36.8					34.3	
Approach LOS		D					C	
Intersection Summary								

## Queues

Existing AM

## 1: Highway 26-McKibbin Drive &amp; St Vincent Street-County Road 7



Lane Group	EBL2	EBL	NBL2	NBL	NBT	NBR	SBL	SBT	SEL	SET	NWL2	NWL
Lane Configurations												
Volume (vph)	1	1	1	69	22	8	40	35	4	256	3	3
Lane Group Flow (vph)	0	22	0	0	100	9	0	91	4	283	0	6
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm		Perm	Perm
Protected Phases		9			2			6		4		
Permitted Phases	9		2	2		2	6		4		8	8
Detector Phases	9	9	2	2	2	2	6	6	4	4	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio		0.14			0.12	0.01		0.09	0.02	0.70		0.03
Control Delay		28.2			10.5	6.9		9.7	24.2	40.8		24.7
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay		28.2			10.5	6.9		9.7	24.2	40.8		24.7
Queue Length 50th (m)		2.0			5.3	0.0		4.4	0.5	44.8		0.8
Queue Length 95th (m)		8.8			18.8	2.4		16.3	2.9	65.7		3.6
Internal Link Dist (m)		68.1			3576.0			763.0		331.6		
Turn Bay Length (m)												
Base Capacity (vph)		488			838	1021		984	239	513		226
Starvation Cap Reductn		0			0	0		0	0	0		0
Spillback Cap Reductn		0			0	0		0	0	0		0
Storage Cap Reductn		0			0	0		0	0	0		0
Reduced v/c Ratio		0.05			0.12	0.01		0.09	0.02	0.55		0.03

## Intersection Summary

Cycle Length: 90

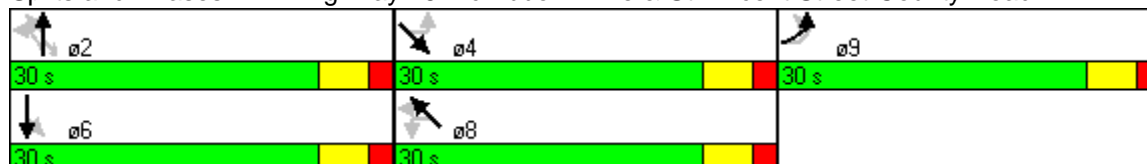
Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Splits and Phases: 1: Highway 26-McKibbin Drive &amp; St Vincent Street-County Road 7



















## 1: Highway 26-McKibbin Drive &amp; St Vincent Street-County Road 7



Lane Group	NWT
Lane Configurations	P
Volume (vph)	234
Lane Group Flow (vph)	267
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	8
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	30.0
Total Split (%)	33.3%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	0.64
Control Delay	37.6
Queue Delay	0.0
Total Delay	37.6
Queue Length 50th (m)	41.1
Queue Length 95th (m)	60.9
Internal Link Dist (m)	393.4
Turn Bay Length (m)	
Base Capacity (vph)	528
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.51
Intersection Summary	

# HCM Unsignalized Intersection Capacity Analysis 2: Highway 26 & Garden Centre Access-3rd Line

















Existing AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	259	7	4	204	0	14	0	3	1	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	282	8	4	222	0	15	0	3	1	0	1
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	222			289			519	518	285	521	522	222
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	222			289			519	518	285	521	522	222
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			97	100	100	100	100	100
cM capacity (veh/h)	1359			1284			468	463	758	466	460	823
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	290	226	18	2								
Volume Left	1	4	15	1								
Volume Right	8	0	3	1								
cSH	1359	1284	502	595								
Volume to Capacity	0.00	0.00	0.04	0.00								
Queue Length 95th (m)	0.0	0.1	0.9	0.1								
Control Delay (s)	0.0	0.2	12.4	11.1								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.0	0.2	12.4	11.1								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization		24.6%		ICU Level of Service					A			
Analysis Period (min)		15										

# HCM Unsignalized Intersection Capacity Analysis

## 3: Sideroad 7 & 3rd Line

















Existing AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	2	0	0	0	0	7	12	0	0	9	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	2	0	0	0	0	8	13	0	0	10	2
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	39	39	11	40	40	13	12			13		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	39	39	11	40	40	13	12			13		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	100	100			100		
cM capacity (veh/h)	967	853	1076	963	852	1073	1620			1619		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	3	0	21	12								
Volume Left	1	0	8	0								
Volume Right	0	0	0	2								
cSH	888	1700	1620	1619								
Volume to Capacity	0.00	0.00	0.00	0.00								
Queue Length 95th (m)	0.1	0.0	0.1	0.0								
Control Delay (s)	9.1	0.0	2.7	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	9.1	0.0	2.7	0.0								
Approach LOS	A	A										
Intersection Summary												
Average Delay			2.4									
Intersection Capacity Utilization			16.8%			ICU Level of Service				A		
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis










## 4: Sideroad 7 & County Road 7

Existing AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	1	9	0	4	1	9	44	0	0	48	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	1	10	0	4	1	10	48	0	0	52	1
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	123	120	53	130	121	48	53			48		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	123	120	53	130	121	48	53			48		
tC, single (s)	7.1	6.5	6.4	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.5	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	99	100	99	100	99			100		
cM capacity (veh/h)	847	769	961	833	769	1027	1565			1572		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	14	5	58	53								
Volume Left	3	0	10	0								
Volume Right	10	1	0	1								
cSH	915	809	1565	1572								
Volume to Capacity	0.02	0.01	0.01	0.00								
Queue Length 95th (m)	0.4	0.2	0.1	0.0								
Control Delay (s)	9.0	9.5	1.3	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	9.0	9.5	1.3	0.0								
Approach LOS	A	A										
Intersection Summary												
Average Delay			1.9									
Intersection Capacity Utilization			19.6%		ICU Level of Service					A		
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis 5: Sideroad 10 & 3rd Line

Existing AM






						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	0	5	9	9	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	5	10	10	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	33	12	14			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	33	12	14			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	983	1075	1617			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	15	14			
Volume Left	0	5	0			
Volume Right	0	0	4			
cSH	1700	1617	1700			
Volume to Capacity	0.00	0.00	0.01			
Queue Length 95th (m)	0.0	0.1	0.0			
Control Delay (s)	0.0	2.6	0.0			
Lane LOS	A	A				
Approach Delay (s)	0.0	2.6	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			8.2%	ICU Level of Service	A	
Analysis Period (min)			15			



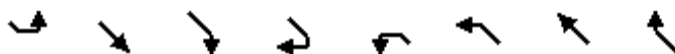
# HCM Signalized Intersection Capacity Analysis

Existing PM

## 1: Highway 26-McKibbin Drive & St Vincent Street-Grey County Road 7

												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SBR2
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0		4.0		
Lane Util. Factor		1.00					1.00	1.00		1.00		
Frt		0.89					1.00	0.85		0.99		
Flt Protected		0.99					0.97	1.00		0.97		
Satd. Flow (prot)		1697					1862	1633		1803		
Flt Permitted		0.92					0.75	1.00		0.73		
Satd. Flow (perm)		1584					1448	1633		1364		
Volume (vph)	1	1	4	4	2	77	45	15	107	34	3	6
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	4	4	2	84	49	16	116	37	3	7
RTOR Reduction (vph)	0	4	0	0	0	0	0	8	0	1	0	0
Lane Group Flow (vph)	0	6	0	0	0	0	135	8	0	162	0	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	0%	0%
Turn Type	Perm				Perm		Perm	Perm	Perm	Perm		
Protected Phases		9					2			6		
Permitted Phases	9				2	2		2	6			
Actuated Green, G (s)		1.4					41.2	41.2		41.2		
Effective Green, g (s)		3.4					43.2	43.2		43.2		
Actuated g/C Ratio		0.04					0.48	0.48		0.48		
Clearance Time (s)		6.0					6.0	6.0		6.0		
Vehicle Extension (s)		3.0					3.0	3.0		3.0		
Lane Grp Cap (vph)		60					695	784		655		
v/s Ratio Prot												
v/s Ratio Perm		c0.00					0.09	0.00		c0.12		
v/c Ratio		0.10					0.19	0.01		0.25		
Uniform Delay, d1		41.8					13.4	12.2		13.8		
Progression Factor		1.00					1.00	1.00		1.00		
Incremental Delay, d2		0.8					0.6	0.0		0.9		
Delay (s)		42.6					14.0	12.2		14.7		
Level of Service		D					B	B		B		
Approach Delay (s)		42.6					13.9			14.7		
Approach LOS		D					B			B		
<b>Intersection Summary</b>												
HCM Average Control Delay		27.7					HCM Level of Service			C		
HCM Volume to Capacity ratio		0.47										
Actuated Cycle Length (s)		90.0					Sum of lost time (s)			12.0		
Intersection Capacity Utilization		55.0%					ICU Level of Service			A		
Analysis Period (min)		15										
c Critical Lane Group												

1: Highway 26-McKibbin Drive & St Vincent Street-Grey County Road 7



Movement	SEL	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations								
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	1.00				1.00	1.00	
Frt	1.00	0.99				1.00	1.00	
Flt Protected	0.95	1.00				0.95	1.00	
Satd. Flow (prot)	1825	1892				1720	1893	
Flt Permitted	0.14	1.00				0.25	1.00	
Satd. Flow (perm)	274	1892				456	1893	
Volume (vph)	8	400	9	6	15	6	488	17
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	435	10	7	16	7	530	18
RTOR Reduction (vph)	0	1	0	0	0	0	1	0
Lane Group Flow (vph)	9	451	0	0	0	23	547	0
Heavy Vehicles (%)	0%	1%	0%	0%	0%	20%	1%	0%
Turn Type	Perm				Perm		Perm	
Protected Phases		4					8	
Permitted Phases	4				8	8		
Actuated Green, G (s)	29.4	29.4				29.4	29.4	
Effective Green, g (s)	31.4	31.4				31.4	31.4	
Actuated g/C Ratio	0.35	0.35				0.35	0.35	
Clearance Time (s)	6.0	6.0				6.0	6.0	
Vehicle Extension (s)	3.0	3.0				3.0	3.0	
Lane Grp Cap (vph)	96	660				159	660	
v/s Ratio Prot		0.24					c0.29	
v/s Ratio Perm	0.03					0.05		
v/c Ratio	0.09	0.68				0.14	0.83	
Uniform Delay, d1	19.7	25.1				20.1	26.8	
Progression Factor	1.00	1.00				1.00	1.00	
Incremental Delay, d2	0.4	2.9				0.4	8.4	
Delay (s)	20.1	28.0				20.5	35.3	
Level of Service	C	C				C	D	
Approach Delay (s)		27.8					34.7	
Approach LOS		C					C	

Intersection Summary

## Queues

Existing PM

## 1: Highway 26-McKibbon Drive &amp; St Vincent Street-Grey County Road 7



Lane Group	EBL2	EBL	NBL2	NBL	NBT	NBR	SBL	SBT	SEL	SET	NWL2	NWL
Lane Configurations												
Volume (vph)	1	1	2	77	45	15	107	34	8	400	15	6
Lane Group Flow (vph)	0	10	0	0	135	16	0	163	9	452	0	23
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm		Perm	Perm
Protected Phases		9			2			6		4		
Permitted Phases	9		2	2		2	6		4		8	8
Detector Phases	9	9	2	2	2	2	6	6	4	4	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	22.0	22.0	26.0	26.0	26.0	26.0	26.0	26.0	42.0	42.0	42.0	42.0
Total Split (%)	24.4%	24.4%	28.9%	28.9%	28.9%	28.9%	28.9%	28.9%	46.7%	46.7%	46.7%	46.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio		0.07			0.18	0.02		0.25	0.06	0.68		0.11
Control Delay		31.4			14.9	8.1		15.7	17.5	30.1		18.7
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay		31.4			14.9	8.1		15.7	17.5	30.1		18.7
Queue Length 50th (m)		1.0			10.7	0.0		13.3	1.0	65.2		2.6
Queue Length 95th (m)		5.7			30.6	4.1		37.8	3.8	86.4		7.2
Internal Link Dist (m)		68.1			774.4			763.0		331.6		
Turn Bay Length (m)												
Base Capacity (vph)		335			770	879		656	189	799		248
Starvation Cap Reductn		0			0	0		0	0	0		0
Spillback Cap Reductn		0			0	0		0	0	0		0
Storage Cap Reductn		0			0	0		0	0	0		0
Reduced v/c Ratio		0.03			0.18	0.02		0.25	0.05	0.57		0.09

## Intersection Summary

Cycle Length: 90

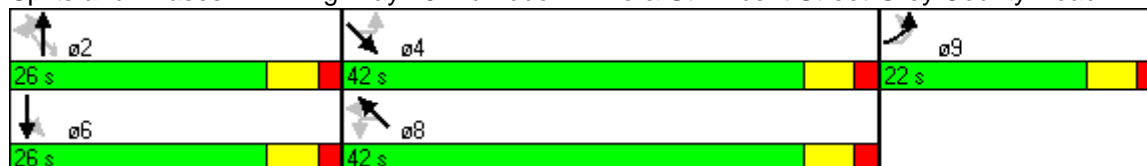
Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Splits and Phases: 1: Highway 26-McKibbon Drive &amp; St Vincent Street-Grey County Road 7



## 1: Highway 26-McKibbin Drive &amp; St Vincent Street-Grey County Road 7



















Lane Group	NWT
Lane Configurations	P
Volume (vph)	488
Lane Group Flow (vph)	548
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	8
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	42.0
Total Split (%)	46.7%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	0.83
Control Delay	37.7
Queue Delay	0.0
Total Delay	37.7
Queue Length 50th (m)	84.5
Queue Length 95th (m)	110.8
Internal Link Dist (m)	393.4
Turn Bay Length (m)	
Base Capacity (vph)	800
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.69
Intersection Summary	

# HCM Unsignalized Intersection Capacity Analysis
















## 2: Highway 26 & Garden Centre Access-3rd Line

Existing PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	318	20	2	378	1	28	0	5	1	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	346	22	2	411	1	30	0	5	1	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								None			
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	412			367			774	775	357	780	785	411
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	412			367			774	775	357	780	785	411
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			90	100	99	100	100	100
cM capacity (veh/h)	1158			1202			317	330	692	312	326	645
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	368	414	36	1								
Volume Left	1	2	30	1								
Volume Right	22	1	5	0								
cSH	1158	1202	346	312								
Volume to Capacity	0.00	0.00	0.10	0.00								
Queue Length 95th (m)	0.0	0.0	2.6	0.1								
Control Delay (s)	0.0	0.1	16.6	16.6								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.0	0.1	16.6	16.6								
Approach LOS			C	C								
Intersection Summary												
Average Delay			0.8									
Intersection Capacity Utilization		31.4%		ICU Level of Service		A						
Analysis Period (min)		15										

# HCM Unsignalized Intersection Capacity Analysis 3: Sideroad 7 & 3rd Line

















Existing PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	2	0	2	0	0	0	0	4	7	3	12	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	0	2	0	0	0	0	4	8	3	13	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	28	32	13	30	28	8	13			12		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	28	32	13	30	28	8	13			12		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	100	100			100		
cM capacity (veh/h)	986	863	1073	980	868	1080	1619			1620		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	4	0	12	16								
Volume Left	2	0	0	3								
Volume Right	2	0	8	0								
cSH	1027	1700	1619	1620								
Volume to Capacity	0.00	0.00	0.00	0.00								
Queue Length 95th (m)	0.1	0.0	0.0	0.0								
Control Delay (s)	8.5	0.0	0.0	1.5								
Lane LOS	A	A		A								
Approach Delay (s)	8.5	0.0	0.0	1.5								
Approach LOS	A	A										
Intersection Summary												
Average Delay			1.9									
Intersection Capacity Utilization			13.3%		ICU Level of Service					A		
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis





## 4: Sideroad 7 & Grey County 7

Existing PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	1	0	0	0	1	3	33	0	0	34	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	1	0	0	0	1	3	36	0	0	37	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	83	82	39	82	84	36	41			36		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	83	82	39	82	84	36	41			36		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	100	100			100		
cM capacity (veh/h)	907	811	1038	908	809	1043	1581			1588		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	4	1	39	41								
Volume Left	3	0	3	0								
Volume Right	0	1	0	4								
cSH	881	1043	1581	1588								
Volume to Capacity	0.00	0.00	0.00	0.00								
Queue Length 95th (m)	0.1	0.0	0.0	0.0								
Control Delay (s)	9.1	8.5	0.6	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	9.1	8.5	0.6	0.0								
Approach LOS	A	A										
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization			14.2%	ICU Level of Service				A				
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis 5: Sideroad 10 & 3rd Line

Existing PM







						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	0	0	13	5	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	14	5	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	21	7	8			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	21	7	8			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	1001	1082	1626			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	14	8			
Volume Left	0	0	0			
Volume Right	0	0	2			
cSH	1700	1626	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service	A	
Analysis Period (min)			15			



# HCM Signalized Intersection Capacity Analysis

Existing SAT

## 1: Highway 12-McKibbin Drive & St Vincent Street-Grey County Road 7

												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SEL
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0		4.0		4.0
Lane Util. Factor		1.00					1.00	1.00		1.00		1.00
Frt		0.88					1.00	0.85		1.00		1.00
Flt Protected		0.99					0.96	1.00		0.97		0.95
Satd. Flow (prot)		1687					1833	1633		1859		1825
Flt Permitted		0.95					0.75	1.00		0.80		0.36
Satd. Flow (perm)		1610					1421	1633		1541		699
Volume (vph)	1	1	5	6	2	86	22	8	57	34	2	4
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	5	7	2	93	24	9	62	37	2	4
RTOR Reduction (vph)	0	7	0	0	0	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	7	0	0	0	0	119	5	0	101	0	4
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%
Turn Type	Perm				Perm	Perm		Perm	Perm			Perm
Protected Phases		9					2			6		
Permitted Phases	9				2	2		2	6			4
Actuated Green, G (s)		1.4					52.4	52.4		52.4		18.2
Effective Green, g (s)		3.4					54.4	54.4		54.4		20.2
Actuated g/C Ratio		0.04					0.60	0.60		0.60		0.22
Clearance Time (s)		6.0					6.0	6.0		6.0		6.0
Vehicle Extension (s)		3.0					3.0	3.0		3.0		3.0
Lane Grp Cap (vph)		61					859	987		931		157
v/s Ratio Prot												
v/s Ratio Perm		c0.00					c0.08	0.00		0.07		0.01
v/c Ratio		0.12					0.14	0.01		0.11		0.03
Uniform Delay, d1		41.9					7.7	7.1		7.5		27.2
Progression Factor		1.00					1.00	1.00		1.00		1.00
Incremental Delay, d2		0.9					0.3	0.0		0.2		0.1
Delay (s)		42.7					8.0	7.1		7.8		27.3
Level of Service		D					A	A		A		C
Approach Delay (s)		42.7					8.0			7.8		
Approach LOS		D					A			A		
<b>Intersection Summary</b>												
HCM Average Control Delay		27.5					HCM Level of Service			C		
HCM Volume to Capacity ratio		0.28										
Actuated Cycle Length (s)		90.0					Sum of lost time (s)			12.0		
Intersection Capacity Utilization		39.3%					ICU Level of Service			A		
Analysis Period (min)		15										
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 1: Highway 12-McKibbin Drive & St Vincent Street-Grey County Road 7

Existing SAT



Movement	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations	P				P	P	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0				4.0	4.0	
Lane Util. Factor	1.00				1.00	1.00	
Frt	0.99				1.00	0.99	
Flt Protected	1.00				0.95	1.00	
Satd. Flow (prot)	1898				1825	1899	
Flt Permitted	1.00				0.31	1.00	
Satd. Flow (perm)	1898				594	1899	
Volume (vph)	251	12	5	1	5	229	12
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	273	13	5	1	5	249	13
RTOR Reduction (vph)	1	0	0	0	0	2	0
Lane Group Flow (vph)	290	0	0	0	6	260	0
Heavy Vehicles (%)	0%	6%	0%	0%	0%	0%	8%
Turn Type				Perm	Perm		
Protected Phases	4					8	
Permitted Phases				8	8		
Actuated Green, G (s)	18.2				18.2	18.2	
Effective Green, g (s)	20.2				20.2	20.2	
Actuated g/C Ratio	0.22				0.22	0.22	
Clearance Time (s)	6.0				6.0	6.0	
Vehicle Extension (s)	3.0				3.0	3.0	
Lane Grp Cap (vph)	426				133	426	
v/s Ratio Prot	0.15					0.14	
v/s Ratio Perm					0.01		
v/c Ratio	0.68				0.05	0.61	
Uniform Delay, d1	32.0				27.3	31.4	
Progression Factor	1.00				1.00	1.00	
Incremental Delay, d2	4.5				0.1	2.5	
Delay (s)	36.4				27.5	33.8	
Level of Service	D				C	C	
Approach Delay (s)	36.3					33.7	
Approach LOS	D					C	

### Intersection Summary

## Queues

Existing SAT

## 1: Highway 12-McKibbon Drive &amp; St Vincent Street-Grey County Road 7



Lane Group	EBL2	EBL	NBL2	NBL	NBT	NBR	SBL	SBT	SEL	SET	NWL2	NWL
Lane Configurations												
Volume (vph)	1	1	2	86	22	8	57	34	4	251	1	5
Lane Group Flow (vph)	0	14	0	0	119	9	0	101	4	291	0	6
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm		Perm	Perm
Protected Phases		9			2			6		4		
Permitted Phases	9		2	2		2	6		4		8	8
Detector Phases	9	9	2	2	2	2	6	6	4	4	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	29.0	29.0	28.0	28.0	28.0	28.0	28.0	28.0	33.0	33.0	33.0	33.0
Total Split (%)	32.2%	32.2%	31.1%	31.1%	31.1%	31.1%	31.1%	31.1%	36.7%	36.7%	36.7%	36.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio		0.09			0.13	0.01		0.10	0.02	0.68		0.03
Control Delay		28.5			8.6	5.9		8.5	24.2	39.8		24.7
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay		28.5			8.6	5.9		8.5	24.2	39.8		24.7
Queue Length 50th (m)		1.1			6.1	0.0		5.1	0.5	46.2		0.8
Queue Length 95th (m)		6.6			21.6	2.4		18.6	2.9	65.5		3.5
Internal Link Dist (m)		68.1			781.4			763.0		331.6		
Turn Bay Length (m)												
Base Capacity (vph)		468			925	1077		979	288	613		264
Starvation Cap Reductn		0			0	0		0	0	0		0
Spillback Cap Reductn		0			0	0		0	0	0		0
Storage Cap Reductn		0			0	0		0	0	0		0
Reduced v/c Ratio		0.03			0.13	0.01		0.10	0.01	0.47		0.02

## Intersection Summary

Cycle Length: 90

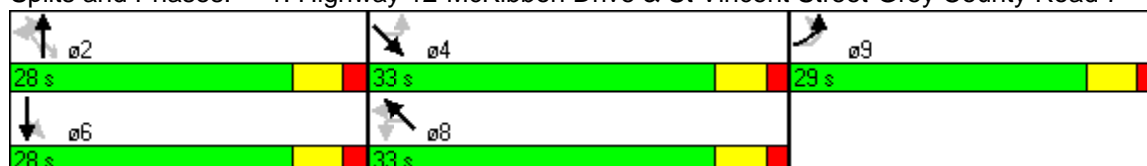
Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Splits and Phases: 1: Highway 12-McKibbon Drive &amp; St Vincent Street-Grey County Road 7



## 1: Highway 12-McKibbin Drive &amp; St Vincent Street-Grey County Road 7



















Lane Group	NWT
Lane Configurations	P
Volume (vph)	229
Lane Group Flow (vph)	262
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	8
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	33.0
Total Split (%)	36.7%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	0.61
Control Delay	36.6
Queue Delay	0.0
Total Delay	36.6
Queue Length 50th (m)	40.5
Queue Length 95th (m)	58.5
Internal Link Dist (m)	393.4
Turn Bay Length (m)	
Base Capacity (vph)	614
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.43
Intersection Summary	

# HCM Unsignalized Intersection Capacity Analysis

## 2: Highway 26 & Garden Centre Access-3rd Line
















Existing SAT

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	4	305	16	7	312	0	22	0	10	1	0	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	332	17	8	339	0	24	0	11	1	0	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	339			349			708	703	340	714	712	339
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	339			349			708	703	340	714	712	339
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			93	100	98	100	100	99
cM capacity (veh/h)	1231			1221			348	361	707	341	357	708
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	353	347	35	5								
Volume Left	4	8	24	1								
Volume Right	17	0	11	4								
cSH	1231	1221	413	582								
Volume to Capacity	0.00	0.01	0.08	0.01								
Queue Length 95th (m)	0.1	0.1	2.1	0.2								
Control Delay (s)	0.1	0.2	14.5	11.2								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	14.5	11.2								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization		32.3%		ICU Level of Service						A		
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

Existing SAT

















## 3: Sideroad 7 & 3rd Line

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Sign Control		Stop			Stop			Free			Free			
Grade		0%			0%			0%			0%			
Volume (veh/h)	9	0	5	0	0	0	0	7	7	5	15	0		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Hourly flow rate (vph)	10	0	5	0	0	0	0	8	8	5	16	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	39	42	16	44	39	11	16			15				
vC1, stage 1 conf vol														
vC2, stage 2 conf vol														
vCu, unblocked vol	39	42	16	44	39	11	16			15				
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1				
tC, 2 stage (s)														
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2				
p0 queue free %	99	100	99	100	100	100	100			100				
cM capacity (veh/h)	969	851	1069	956	855	1075	1614			1616				
Direction, Lane #	EB 1	WB 1	NB 1	SB 1										
Volume Total	15	0	15	22										
Volume Left	10	0	0	5										
Volume Right	5	0	8	0										
cSH	1002	1700	1614	1616										
Volume to Capacity	0.02	0.00	0.00	0.00										
Queue Length 95th (m)	0.4	0.0	0.0	0.1										
Control Delay (s)	8.6	0.0	0.0	1.8										
Lane LOS	A	A		A										
Approach Delay (s)	8.6	0.0	0.0	1.8										
Approach LOS	A	A												
Intersection Summary														
Average Delay			3.3											
Intersection Capacity Utilization			15.2%		ICU Level of Service						A			
Analysis Period (min)			15											

# HCM Unsignalized Intersection Capacity Analysis





## 4: Sideroad 7 & Grey County 7

Existing SAT

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	6	1	3	0	1	1	6	66	0	2	57	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	1	3	0	1	1	7	72	0	2	62	10
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	158	156	67	160	161	72	72			72		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	158	156	67	160	161	72	72			72		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	100	100	100	100			100		
cM capacity (veh/h)	808	735	1002	803	731	996	1541			1541		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	11	2	78	74								
Volume Left	7	0	7	2								
Volume Right	3	1	0	10								
cSH	849	843	1541	1541								
Volume to Capacity	0.01	0.00	0.00	0.00								
Queue Length 95th (m)	0.3	0.1	0.1	0.0								
Control Delay (s)	9.3	9.3	0.6	0.2								
Lane LOS	A	A	A	A								
Approach Delay (s)	9.3	9.3	0.6	0.2								
Approach LOS	A	A										
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization			18.7%	ICU Level of Service						A		
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis 5: Sideroad 10 & 3rd Line

Existing SAT

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	0	5	11	18	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	5	12	20	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	45	22	24			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	45	22	24			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	968	1061	1604			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	17	24			
Volume Left	0	5	0			
Volume Right	0	0	4			
cSH	1700	1604	1700			
Volume to Capacity	0.00	0.00	0.01			
Queue Length 95th (m)	0.0	0.1	0.0			
Control Delay (s)	0.0	2.3	0.0			
Lane LOS	A	A				
Approach Delay (s)	0.0	2.3	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			8.3%	ICU Level of Service	A	
Analysis Period (min)			15			








**APPENDIX D**  
**Future (2017) Background Traffic Conditions**  
**Analysis Outputs**  
Level of Service Calculations

# HCM Signalized Intersection Capacity Analysis

Future (2017) Background AM

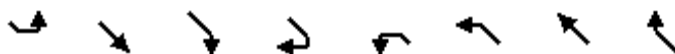
## 1: Highway 26-McKibbin Drive & St Vincent Street-County Road 7

												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SBR2
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0		4.0		
Lane Util. Factor		1.00					1.00	1.00		1.00		
Frt		0.88					1.00	0.85		0.99		
Flt Protected		1.00					0.96	1.00		0.98		
Satd. Flow (prot)		1678					1737	1633		1827		
Flt Permitted		0.97					0.77	1.00		0.87		
Satd. Flow (perm)		1628					1392	1633		1619		
Volume (vph)	1	1	9	9	1	69	24	8	40	39	1	8
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	10	10	1	75	26	9	43	42	1	9
RTOR Reduction (vph)	0	9	0	0	0	0	0	4	0	3	0	0
Lane Group Flow (vph)	0	13	0	0	0	0	102	5	0	92	0	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	9%	0%	0%	3%	0%	0%	0%
Turn Type	Perm				Perm		Perm	Perm	Perm	Perm		
Protected Phases		9					2			6		
Permitted Phases	9				2	2		2	6			
Actuated Green, G (s)		2.9					49.5	49.5		49.5		
Effective Green, g (s)		4.9					51.5	51.5		51.5		
Actuated g/C Ratio		0.05					0.57	0.57		0.57		
Clearance Time (s)		6.0					6.0	6.0		6.0		
Vehicle Extension (s)		3.0					3.0	3.0		3.0		
Lane Grp Cap (vph)		89					797	934		926		
v/s Ratio Prot												
v/s Ratio Perm		c0.01					c0.07	0.00		0.06		
v/c Ratio		0.14					0.13	0.01		0.10		
Uniform Delay, d1		40.5					8.9	8.3		8.7		
Progression Factor		1.00					1.00	1.00		1.00		
Incremental Delay, d2		0.7					0.3	0.0		0.2		
Delay (s)		41.3					9.2	8.3		8.9		
Level of Service		D					A	A		A		
Approach Delay (s)		41.3					9.1			8.9		
Approach LOS		D					A			A		
<b>Intersection Summary</b>												
HCM Average Control Delay		29.7					HCM Level of Service			C		
HCM Volume to Capacity ratio		0.30										
Actuated Cycle Length (s)		90.0					Sum of lost time (s)			12.0		
Intersection Capacity Utilization		40.0%					ICU Level of Service			A		
Analysis Period (min)		15										
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

Future (2017) Background AM

## 1: Highway 26-McKibbin Drive & St Vincent Street-County Road 7






















Movement	SEL	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations								
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	1.00				1.00	1.00	
Frt	1.00	1.00				1.00	0.99	
Flt Protected	0.95	1.00				0.95	1.00	
Satd. Flow (prot)	1825	1777				1825	1821	
Flt Permitted	0.33	1.00				0.30	1.00	
Satd. Flow (perm)	639	1777				571	1821	
Volume (vph)	4	282	3	2	3	3	257	12
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	307	3	2	3	3	279	13
RTOR Reduction (vph)	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	4	312	0	0	0	6	290	0
Heavy Vehicles (%)	0%	8%	0%	0%	0%	0%	5%	0%
Turn Type	Perm		Perm			Perm		
Protected Phases	4					8		
Permitted Phases	4		8			8		
Actuated Green, G (s)	19.6	19.6				19.6	19.6	
Effective Green, g (s)	21.6	21.6				21.6	21.6	
Actuated g/C Ratio	0.24	0.24				0.24	0.24	
Clearance Time (s)	6.0	6.0				6.0	6.0	
Vehicle Extension (s)	3.0	3.0				3.0	3.0	
Lane Grp Cap (vph)	153	426				137	437	
v/s Ratio Prot	c0.18					0.16		
v/s Ratio Perm	0.01					0.01		
v/c Ratio	0.03	0.73				0.04	0.66	
Uniform Delay, d1	26.2	31.5				26.3	30.9	
Progression Factor	1.00	1.00				1.00	1.00	
Incremental Delay, d2	0.1	6.4				0.1	3.8	
Delay (s)	26.2	37.9				26.4	34.7	
Level of Service	C	D				C	C	
Approach Delay (s)	37.8					34.5		
Approach LOS	D					C		

### Intersection Summary

## Queues

Future (2017) Background AM

## 1: Highway 26-McKibbin Drive &amp; St Vincent Street-County Road 7

												
Lane Group	EBL2	EBL	NBL2	NBL	NBT	NBR	SBL	SBT	SEL	SET	NWL2	NWL
Lane Configurations												
Volume (vph)	1	1	1	69	24	8	40	39	4	282	3	3
Lane Group Flow (vph)	0	22	0	0	102	9	0	95	4	312	0	6
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm		Perm	Perm
Protected Phases		9			2			6		4		
Permitted Phases	9		2	2		2	6		4		8	8
Detector Phases	9	9	2	2	2	2	6	6	4	4	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio		0.14			0.12	0.01		0.10	0.02	0.73		0.04
Control Delay		28.2			10.9	7.0		10.1	24.0	41.6		24.3
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay		28.2			10.9	7.0		10.1	24.0	41.6		24.3
Queue Length 50th (m)		2.0			5.6	0.0		4.8	0.5	49.5		0.8
Queue Length 95th (m)		8.8			19.1	2.4		16.8	2.9	72.9		3.6
Internal Link Dist (m)		68.1			3576.0			763.0		331.6		
Turn Bay Length (m)												
Base Capacity (vph)		488			829	1003		973	219	513		202
Starvation Cap Reductn		0			0	0		0	0	0		0
Spillback Cap Reductn		0			0	0		0	0	0		0
Storage Cap Reductn		0			0	0		0	0	0		0
Reduced v/c Ratio		0.05			0.12	0.01		0.10	0.02	0.61		0.03

## Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Splits and Phases: 1: Highway 26-McKibbin Drive &amp; St Vincent Street-County Road 7



















## 1: Highway 26-McKibbin Drive &amp; St Vincent Street-County Road 7



Lane Group	NWT
Lane Configurations	8
Volume (vph)	257
Lane Group Flow (vph)	292
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	8
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	30.0
Total Split (%)	33.3%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	0.66
Control Delay	37.8
Queue Delay	0.0
Total Delay	37.8
Queue Length 50th (m)	45.0
Queue Length 95th (m)	67.0
Internal Link Dist (m)	393.4
Turn Bay Length (m)	
Base Capacity (vph)	528
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.55
Intersection Summary	










## HCM Unsignalized Intersection Capacity Analysis 2: Highway 26 & Garden Centre Access-3rd Line

Future (2017) Background AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	285	7	4	224	0	14	0	3	1	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	310	8	4	243	0	15	0	3	1	0	1
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	243			317			569	568	314	571	572	243
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	243			317			569	568	314	571	572	243
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			96	100	100	100	100	100
cM capacity (veh/h)	1335			1254			434	433	731	431	431	800
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	318	248	18	2								
Volume Left	1	4	15	1								
Volume Right	8	0	3	1								
cSH	1335	1254	468	560								
Volume to Capacity	0.00	0.00	0.04	0.00								
Queue Length 95th (m)	0.0	0.1	0.9	0.1								
Control Delay (s)	0.0	0.2	13.0	11.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.0	0.2	13.0	11.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.5									
Intersection Capacity Utilization			25.9%		ICU Level of Service					A		
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis 3: Sideroad 7 & 3rd Line

















Future (2017) Background AM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	1	0	7	12	9	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	0	8	13	10	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	39	11	12			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	39	11	12			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	973	1076	1620			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	1	21	12			
Volume Left	1	8	0			
Volume Right	0	0	2			
cSH	973	1620	1700			
Volume to Capacity	0.00	0.00	0.01			
Queue Length 95th (m)	0.0	0.1	0.0			
Control Delay (s)	8.7	2.7	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.7	2.7	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		1.9				
Intersection Capacity Utilization		16.8%		ICU Level of Service		A
Analysis Period (min)		15				

# HCM Unsignalized Intersection Capacity Analysis

## 4: Sideroad 7 & County Road 7










Future (2017) Background AM

















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	1	9	0	4	1	9	48	0	0	53	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	1	10	0	4	1	10	52	0	0	58	1
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	133	130	58	140	130	52	59			52		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	133	130	58	140	130	52	59			52		
tC, single (s)	7.1	6.5	6.4	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.5	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	99	100	99	100	99			100		
cM capacity (veh/h)	835	760	954	821	759	1021	1558			1567		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	14	5	62	59								
Volume Left	3	0	10	0								
Volume Right	10	1	0	1								
cSH	906	800	1558	1567								
Volume to Capacity	0.02	0.01	0.01	0.00								
Queue Length 95th (m)	0.4	0.2	0.1	0.0								
Control Delay (s)	9.0	9.5	1.2	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	9.0	9.5	1.2	0.0								
Approach LOS	A	A										
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization			19.9%		ICU Level of Service					A		
Analysis Period (min)			15									



# HCM Unsignalized Intersection Capacity Analysis 5: Sideroad 10 & 3rd Line

Future (2017) Background AM

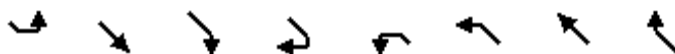
						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	0	5	9	9	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	5	10	10	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	33	12	14			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	33	12	14			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	983	1075	1617			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	15	14			
Volume Left	0	5	0			
Volume Right	0	0	4			
cSH	1700	1617	1700			
Volume to Capacity	0.00	0.00	0.01			
Queue Length 95th (m)	0.0	0.1	0.0			
Control Delay (s)	0.0	2.6	0.0			
Lane LOS	A	A				
Approach Delay (s)	0.0	2.6	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			8.2%		ICU Level of Service	
Analysis Period (min)			15			

												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SBR2
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0		4.0		
Lane Util. Factor		1.00					1.00	1.00		1.00		
Frt		0.89					1.00	0.85		0.99		
Flt Protected		0.99					0.97	1.00		0.97		
Satd. Flow (prot)		1697					1864	1633		1802		
Flt Permitted		0.92					0.76	1.00		0.73		
Satd. Flow (perm)		1584					1455	1633		1361		
Volume (vph)	1	1	4	4	2	77	50	15	107	37	3	6
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	4	4	2	84	54	16	116	40	3	7
RTOR Reduction (vph)	0	4	0	0	0	0	0	9	0	1	0	0
Lane Group Flow (vph)	0	6	0	0	0	0	140	7	0	165	0	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	0%	0%
Turn Type	Perm				Perm	Perm		Perm	Perm			
Protected Phases		9					2			6		
Permitted Phases	9				2	2		2	6			
Actuated Green, G (s)		1.4					39.4	39.4		39.4		
Effective Green, g (s)		3.4					41.4	41.4		41.4		
Actuated g/C Ratio		0.04					0.46	0.46		0.46		
Clearance Time (s)		6.0					6.0	6.0		6.0		
Vehicle Extension (s)		3.0					3.0	3.0		3.0		
Lane Grp Cap (vph)		60					669	751		626		
v/s Ratio Prot												
v/s Ratio Perm		c0.00					0.10	0.00		c0.12		
v/c Ratio		0.10					0.21	0.01		0.26		
Uniform Delay, d1		41.8					14.5	13.2		14.9		
Progression Factor		1.00					1.00	1.00		1.00		
Incremental Delay, d2		0.8					0.7	0.0		1.0		
Delay (s)		42.6					15.2	13.2		16.0		
Level of Service		D					B	B		B		
Approach Delay (s)		42.6					15.0			16.0		
Approach LOS		D					B			B		
<b>Intersection Summary</b>												
HCM Average Control Delay		28.5					HCM Level of Service			C		
HCM Volume to Capacity ratio		0.51										
Actuated Cycle Length (s)		90.0					Sum of lost time (s)			12.0		
Intersection Capacity Utilization		57.7%					ICU Level of Service			B		
Analysis Period (min)		15										
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

Future (2017) Background PM

## 1: Highway 26-McKibbin Drive & St Vincent Street-Grey County Road 7






















Movement	SEL	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations								
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	1.00				1.00	1.00	
Frt	1.00	0.99				1.00	1.00	
Flt Protected	0.95	1.00				0.95	1.00	
Satd. Flow (prot)	1825	1893				1720	1894	
Flt Permitted	0.12	1.00				0.23	1.00	
Satd. Flow (perm)	231	1893				412	1894	
Volume (vph)	8	440	9	6	15	6	537	17
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	478	10	7	16	7	584	18
RTOR Reduction (vph)	0	1	0	0	0	0	1	0
Lane Group Flow (vph)	9	494	0	0	0	23	601	0
Heavy Vehicles (%)	0%	1%	0%	0%	0%	20%	1%	0%
Turn Type	Perm				Perm		Perm	
Protected Phases		4					8	
Permitted Phases	4				8	8		
Actuated Green, G (s)	31.2	31.2				31.2	31.2	
Effective Green, g (s)	33.2	33.2				33.2	33.2	
Actuated g/C Ratio	0.37	0.37				0.37	0.37	
Clearance Time (s)	6.0	6.0				6.0	6.0	
Vehicle Extension (s)	3.0	3.0				3.0	3.0	
Lane Grp Cap (vph)	85	698				152	699	
v/s Ratio Prot		0.26					c0.32	
v/s Ratio Perm	0.04					0.06		
v/c Ratio	0.11	0.71				0.15	0.86	
Uniform Delay, d1	18.7	24.3				19.0	26.2	
Progression Factor	1.00	1.00				1.00	1.00	
Incremental Delay, d2	0.6	3.3				0.5	10.3	
Delay (s)	19.2	27.6				19.4	36.5	
Level of Service	B	C				B	D	
Approach Delay (s)		27.4					35.9	
Approach LOS		C					D	

### Intersection Summary

## Queues

Future (2017) Background PM

## 1: Highway 26-McKibbon Drive &amp; St Vincent Street-Grey County Road 7

												
Lane Group	EBL2	EBL	NBL2	NBL	NBT	NBR	SBL	SBT	SEL	SET	NWL2	NWL
Lane Configurations												
Volume (vph)	1	1	2	77	50	15	107	37	8	440	15	6
Lane Group Flow (vph)	0	10	0	0	140	16	0	166	9	495	0	23
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm		Perm	Perm
Protected Phases		9			2			6		4		
Permitted Phases	9		2	2		2	6		4		8	8
Detector Phases	9	9	2	2	2	2	6	6	4	4	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	22.0	22.0	26.0	26.0	26.0	26.0	26.0	26.0	42.0	42.0	42.0	42.0
Total Split (%)	24.4%	24.4%	28.9%	28.9%	28.9%	28.9%	28.9%	28.9%	46.7%	46.7%	46.7%	46.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio		0.07			0.19	0.02		0.27	0.07	0.71		0.12
Control Delay		31.4			15.7	8.2		16.7	17.5	29.7		18.4
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay		31.4			15.7	8.2		16.7	17.5	29.7		18.4
Queue Length 50th (m)		1.0			12.0	0.0		14.7	1.0	69.6		2.5
Queue Length 95th (m)		5.7			31.7	4.1		38.6	3.9	96.8		7.4
Internal Link Dist (m)		68.1			774.4			763.0		331.6		
Turn Bay Length (m)												
Base Capacity (vph)		335			744	846		623	148	800		216
Starvation Cap Reductn		0			0	0		0	0	0		0
Spillback Cap Reductn		0			0	0		0	0	0		0
Storage Cap Reductn		0			0	0		0	0	0		0
Reduced v/c Ratio		0.03			0.19	0.02		0.27	0.06	0.62		0.11

## Intersection Summary

Cycle Length: 90






Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Splits and Phases: 1: Highway 26-McKibbon Drive &amp; St Vincent Street-Grey County Road 7

















		
ø2	ø4	ø9
26 s	42 s	22 s
		
ø6	ø8	
26 s	42 s	



Lane Group	NWT
Lane Configurations	8
Volume (vph)	537
Lane Group Flow (vph)	602
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	8
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	42.0
Total Split (%)	46.7%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	0.86
Control Delay	38.9
Queue Delay	0.0
Total Delay	38.9
Queue Length 50th (m)	91.5
Queue Length 95th (m)	125.9
Internal Link Dist (m)	393.4
Turn Bay Length (m)	
Base Capacity (vph)	801
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.75
Intersection Summary	

## HCM Unsignalized Intersection Capacity Analysis 2: Highway 26 & Garden Centre Access-3rd Line










Future (2017) Background PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	350	20	2	416	1	28	0	5	1	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	380	22	2	452	1	30	0	5	1	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	453			402			851	851	391	856	861	453
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	453			402			851	851	391	856	861	453
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			89	100	99	100	100	100
cM capacity (veh/h)	1118			1167			282	298	662	277	294	611
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	403	455	36	1								
Volume Left	1	2	30	1								
Volume Right	22	1	5	0								
cSH	1118	1167	309	277								
Volume to Capacity	0.00	0.00	0.12	0.00								
Queue Length 95th (m)	0.0	0.0	3.0	0.1								
Control Delay (s)	0.0	0.1	18.2	18.0								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.0	0.1	18.2	18.0								
Approach LOS			C	C								
Intersection Summary												
Average Delay			0.8									
Intersection Capacity Utilization		33.4%		ICU Level of Service		A						
Analysis Period (min)		15										

# HCM Unsignalized Intersection Capacity Analysis

## 3: Sideroad 7 & 3rd Line
















Future (2017) Background PM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	2	2	0	4	12	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	2	0	4	13	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	17	13	13			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	17	13	13			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	1006	1073	1619			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	4	4	13			
Volume Left	2	0	0			
Volume Right	2	0	0			
cSH	1038	1619	1700			
Volume to Capacity	0.00	0.00	0.01			
Queue Length 95th (m)	0.1	0.0	0.0			
Control Delay (s)	8.5	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	8.5	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.7			
Intersection Capacity Utilization			13.3%		ICU Level of Service	
Analysis Period (min)			15		A	

# HCM Unsignalized Intersection Capacity Analysis

## 4: Sideroad 7 & Grey County 7










Future (2017) Background PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	1	0	0	0	1	3	36	0	0	37	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	1	0	0	0	1	3	39	0	0	40	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	89	88	42	89	90	39	45			39		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	89	88	42	89	90	39	45			39		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	100	100			100		
cM capacity (veh/h)	898	804	1034	899	802	1038	1577			1584		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	4	1	42	45								
Volume Left	3	0	3	0								
Volume Right	0	1	0	4								
cSH	873	1038	1577	1584								
Volume to Capacity	0.00	0.00	0.00	0.00								
Queue Length 95th (m)	0.1	0.0	0.0	0.0								
Control Delay (s)	9.1	8.5	0.6	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	9.1	8.5	0.6	0.0								
Approach LOS	A	A										
Intersection Summary												
Average Delay			0.8									
Intersection Capacity Utilization			14.4%		ICU Level of Service					A		
Analysis Period (min)			15									



# HCM Unsignalized Intersection Capacity Analysis 5: Sideroad 10 & 3rd Line


















Future (2017) Background PM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	0	0	13	5	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	14	5	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	21	7	8			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	21	7	8			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	1001	1082	1626			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	14	8			
Volume Left	0	0	0			
Volume Right	0	0	2			
cSH	1700	1626	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service	A	
Analysis Period (min)			15			

# HCM Signalized Intersection Capacity Analysis

Future (2017) Background SAT

## 1: Highway 12-McKibbin Drive & St Vincent Street-Grey County Road 7

												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SEL
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0		4.0		4.0
Lane Util. Factor		1.00					1.00	1.00		1.00		1.00
Frt		0.88					1.00	0.85		1.00		1.00
Flt Protected		0.99					0.96	1.00		0.97		0.95
Satd. Flow (prot)		1687					1834	1633		1861		1825
Flt Permitted		0.95					0.75	1.00		0.81		0.33
Satd. Flow (perm)		1610					1423	1633		1547		640
Volume (vph)	1	1	5	6	2	86	24	8	57	37	2	4
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	5	7	2	93	26	9	62	40	2	4
RTOR Reduction (vph)	0	7	0	0	0	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	7	0	0	0	0	121	5	0	104	0	4
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%
Turn Type	Perm				Perm	Perm		Perm	Perm			Perm
Protected Phases		9					2			6		
Permitted Phases	9				2	2		2	6			4
Actuated Green, G (s)		1.4					51.5	51.5		51.5		19.1
Effective Green, g (s)		3.4					53.5	53.5		53.5		21.1
Actuated g/C Ratio		0.04					0.59	0.59		0.59		0.23
Clearance Time (s)		6.0					6.0	6.0		6.0		6.0
Vehicle Extension (s)		3.0					3.0	3.0		3.0		3.0
Lane Grp Cap (vph)		61					846	971		920		150
v/s Ratio Prot												
v/s Ratio Perm		c0.00					c0.09	0.00		0.07		0.01
v/c Ratio		0.12					0.14	0.01		0.11		0.03
Uniform Delay, d1		41.9					8.1	7.4		7.9		26.5
Progression Factor		1.00					1.00	1.00		1.00		1.00
Incremental Delay, d2		0.9					0.4	0.0		0.2		0.1
Delay (s)		42.7					8.4	7.4		8.2		26.6
Level of Service		D					A	A		A		C
Approach Delay (s)		42.7					8.4			8.2		
Approach LOS		D					A			A		
<b>Intersection Summary</b>												
HCM Average Control Delay		28.2					HCM Level of Service			C		
HCM Volume to Capacity ratio		0.30										
Actuated Cycle Length (s)		90.0					Sum of lost time (s)			12.0		
Intersection Capacity Utilization		40.8%					ICU Level of Service			A		
Analysis Period (min)		15										
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

Future (2017) Background SAT

## 1: Highway 12-McKibbin Drive & St Vincent Street-Grey County Road 7



Movement	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations	PT				PT	PT	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0				4.0	4.0	
Lane Util. Factor	1.00				1.00	1.00	
Frt	0.99				1.00	0.99	
Flt Protected	1.00				0.95	1.00	
Satd. Flow (prot)	1900				1825	1901	
Flt Permitted	1.00				0.28	1.00	
Satd. Flow (perm)	1900				533	1901	
Volume (vph)	276	12	5	1	5	252	12
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	300	13	5	1	5	274	13
RTOR Reduction (vph)	1	0	0	0	0	2	0
Lane Group Flow (vph)	317	0	0	0	6	285	0
Heavy Vehicles (%)	0%	6%	0%	0%	0%	0%	8%
Turn Type				Perm	Perm		
Protected Phases	4					8	
Permitted Phases				8	8		
Actuated Green, G (s)	19.1				19.1	19.1	
Effective Green, g (s)	21.1				21.1	21.1	
Actuated g/C Ratio	0.23				0.23	0.23	
Clearance Time (s)	6.0				6.0	6.0	
Vehicle Extension (s)	3.0				3.0	3.0	
Lane Grp Cap (vph)	445				125	446	
v/s Ratio Prot	c0.17					0.15	
v/s Ratio Perm					0.01		
v/c Ratio	0.71				0.05	0.64	
Uniform Delay, d1	31.7				26.7	31.0	
Progression Factor	1.00				1.00	1.00	
Incremental Delay, d2	5.3				0.2	3.0	
Delay (s)	37.0				26.8	34.0	
Level of Service	D				C	C	
Approach Delay (s)	36.9					33.9	
Approach LOS	D					C	

### Intersection Summary

## Queues

Future (2017) Background SAT

## 1: Highway 12-McKibbin Drive &amp; St Vincent Street-Grey County Road 7



Lane Group	EBL2	EBL	NBL2	NBL	NBT	NBR	SBL	SBT	SEL	SET	NWL2	NWL
Lane Configurations												
Volume (vph)	1	1	2	86	24	8	57	37	4	276	1	5
Lane Group Flow (vph)	0	14	0	0	121	9	0	104	4	318	0	6
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm		Perm	Perm
Protected Phases		9			2			6		4		
Permitted Phases	9		2	2		2	6		4		8	8
Detector Phases	9	9	2	2	2	2	6	6	4	4	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio		0.09			0.13	0.01		0.11	0.02	0.71		0.04
Control Delay		28.5			8.8	5.9		8.7	24.2	40.2		24.7
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay		28.5			8.8	5.9		8.7	24.2	40.2		24.7
Queue Length 50th (m)		1.1			6.6	0.0		5.6	0.5	50.1		0.8
Queue Length 95th (m)		6.6			21.7	2.4		18.8	2.9	72.9		3.6
Internal Link Dist (m)		68.1			781.4			763.0		331.6		
Turn Bay Length (m)												
Base Capacity (vph)		487			919	1059		972	222	550		197
Starvation Cap Reductn		0			0	0		0	0	0		0
Spillback Cap Reductn		0			0	0		0	0	0		0
Storage Cap Reductn		0			0	0		0	0	0		0
Reduced v/c Ratio		0.03			0.13	0.01		0.11	0.02	0.58		0.03

## Intersection Summary

Cycle Length: 90

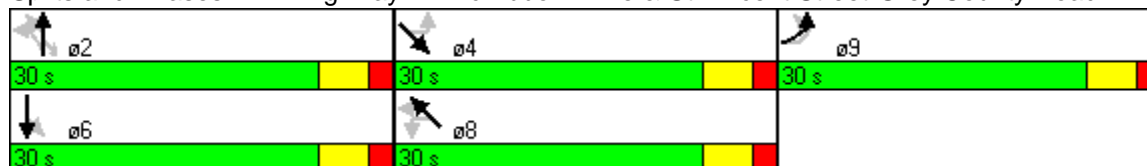
Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Splits and Phases: 1: Highway 12-McKibbin Drive &amp; St Vincent Street-Grey County Road 7



















## 1: Highway 12-McKibbin Drive &amp; St Vincent Street-Grey County Road 7



Lane Group	NWT
Lane Configurations	P
Volume (vph)	252
Lane Group Flow (vph)	287
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	8
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	30.0
Total Split (%)	33.3%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	0.64
Control Delay	36.9
Queue Delay	0.0
Total Delay	36.9
Queue Length 50th (m)	44.1
Queue Length 95th (m)	64.9
Internal Link Dist (m)	393.4
Turn Bay Length (m)	
Base Capacity (vph)	551
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.52
Intersection Summary	










## HCM Unsignalized Intersection Capacity Analysis 2: Highway 26 & Garden Centre Access-3rd Line

Future (2017) Background SAT

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	4	336	16	7	343	0	22	0	10	1	0	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	365	17	8	373	0	24	0	11	1	0	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	373			383			775	771	374	782	779	373
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	373			383			775	771	374	782	779	373
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			92	100	98	100	100	99
cM capacity (veh/h)	1197			1187			313	330	677	307	326	678
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	387	380	35	5								
Volume Left	4	8	24	1								
Volume Right	17	0	11	4								
cSH	1197	1187	376	546								
Volume to Capacity	0.00	0.01	0.09	0.01								
Queue Length 95th (m)	0.1	0.1	2.3	0.2								
Control Delay (s)	0.1	0.2	15.5	11.7								
Lane LOS	A	A	C	B								
Approach Delay (s)	0.1	0.2	15.5	11.7								
Approach LOS			C	B								
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization			34.0%	ICU Level of Service						A		
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis 3: Sideroad 7 & 3rd Line
















Future (2017) Background SAT

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	9	5	0	7	15	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	5	0	8	16	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	24	16	16			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	24	16	16			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	997	1069	1614			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	15	8	16			
Volume Left	10	0	0			
Volume Right	5	0	0			
cSH	1022	1614	1700			
Volume to Capacity	0.01	0.00	0.01			
Queue Length 95th (m)	0.3	0.0	0.0			
Control Delay (s)	8.6	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	8.6	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			3.3			
Intersection Capacity Utilization		13.3%		ICU Level of Service	A	
Analysis Period (min)		15				

# HCM Unsignalized Intersection Capacity Analysis

## 4: Sideroad 7 & Grey County 7





Future (2017) Background SAT

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	6	1	3	0	1	1	6	73	0	2	63	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	1	3	0	1	1	7	79	0	2	68	10
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	172	170	73	174	175	79	78			79		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	172	170	73	174	175	79	78			79		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	100	100	100	100			100		
cM capacity (veh/h)	791	722	994	786	718	987	1533			1532		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	11	2	86	80								
Volume Left	7	0	7	2								
Volume Right	3	1	0	10								
cSH	834	831	1533	1532								
Volume to Capacity	0.01	0.00	0.00	0.00								
Queue Length 95th (m)	0.3	0.1	0.1	0.0								
Control Delay (s)	9.4	9.3	0.6	0.2								
Lane LOS	A	A	A	A								
Approach Delay (s)	9.4	9.3	0.6	0.2								
Approach LOS	A	A										
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization			19.1%		ICU Level of Service					A		
Analysis Period (min)			15									



# HCM Unsignalized Intersection Capacity Analysis 5: Sideroad 10 & 3rd Line

Future (2017) Background SAT






						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	0	5	11	18	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	5	12	20	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	45	22	24			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	45	22	24			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	968	1061	1604			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	17	24			
Volume Left	0	5	0			
Volume Right	0	0	4			
cSH	1700	1604	1700			
Volume to Capacity	0.00	0.00	0.01			
Queue Length 95th (m)	0.0	0.1	0.0			
Control Delay (s)	0.0	2.3	0.0			
Lane LOS	A	A				
Approach Delay (s)	0.0	2.3	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			8.3%	ICU Level of Service	A	
Analysis Period (min)			15			

**APPENDIX E**  
**Future (2022) Background Traffic Conditions**  
**Analysis Outputs**  
Level of Service Calculations

# HCM Signalized Intersection Capacity Analysis

Future (2022) Background AM

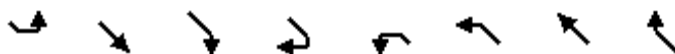
## 1: Highway 26-McKibbin Drive & St Vincent Street-County Road 7

												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SBR2
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0		4.0		
Lane Util. Factor		1.00					1.00	1.00		1.00		
Frt		0.88					1.00	0.85		0.99		
Flt Protected		1.00					0.97	1.00		0.98		
Satd. Flow (prot)		1678					1742	1633		1832		
Flt Permitted		0.97					0.77	1.00		0.87		
Satd. Flow (perm)		1628					1398	1633		1629		
Volume (vph)	1	1	9	9	1	69	27	8	40	43	1	8
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	10	10	1	75	29	9	43	47	1	9
RTOR Reduction (vph)	0	9	0	0	0	0	0	4	0	3	0	0
Lane Group Flow (vph)	0	13	0	0	0	0	105	5	0	97	0	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	9%	0%	0%	3%	0%	0%	0%
Turn Type	Perm				Perm	Perm		Perm	Perm			
Protected Phases		9					2			6		
Permitted Phases	9				2	2		2	6			
Actuated Green, G (s)		2.9					48.4	48.4		48.4		
Effective Green, g (s)		4.9					50.4	50.4		50.4		
Actuated g/C Ratio		0.05					0.56	0.56		0.56		
Clearance Time (s)		6.0					6.0	6.0		6.0		
Vehicle Extension (s)		3.0					3.0	3.0		3.0		
Lane Grp Cap (vph)		89					783	914		912		
v/s Ratio Prot												
v/s Ratio Perm		c0.01					c0.08	0.00		0.06		
v/c Ratio		0.14					0.13	0.01		0.11		
Uniform Delay, d1		40.5					9.4	8.7		9.3		
Progression Factor		1.00					1.00	1.00		1.00		
Incremental Delay, d2		0.7					0.4	0.0		0.2		
Delay (s)		41.3					9.8	8.7		9.5		
Level of Service		D					A	A		A		
Approach Delay (s)		41.3					9.7			9.5		
Approach LOS		D					A			A		
<b>Intersection Summary</b>												
HCM Average Control Delay		30.6					HCM Level of Service			C		
HCM Volume to Capacity ratio		0.32										
Actuated Cycle Length (s)		90.0					Sum of lost time (s)			12.0		
Intersection Capacity Utilization		41.7%					ICU Level of Service			A		
Analysis Period (min)		15										
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

Future (2022) Background AM

## 1: Highway 26-McKibbin Drive & St Vincent Street-County Road 7






















Movement	SEL	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations								
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	1.00				1.00	1.00	
Frt	1.00	1.00				1.00	0.99	
Flt Protected	0.95	1.00				0.95	1.00	
Satd. Flow (prot)	1825	1777				1825	1822	
Flt Permitted	0.30	1.00				0.26	1.00	
Satd. Flow (perm)	573	1777				507	1822	
Volume (vph)	4	312	3	2	3	3	285	12
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	339	3	2	3	3	310	13
RTOR Reduction (vph)	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	4	344	0	0	0	6	322	0
Heavy Vehicles (%)	0%	8%	0%	0%	0%	0%	5%	0%
Turn Type	Perm				Perm		Perm	
Protected Phases	4						8	
Permitted Phases	4				8		8	
Actuated Green, G (s)	20.7	20.7				20.7	20.7	
Effective Green, g (s)	22.7	22.7				22.7	22.7	
Actuated g/C Ratio	0.25	0.25				0.25	0.25	
Clearance Time (s)	6.0	6.0				6.0	6.0	
Vehicle Extension (s)	3.0	3.0				3.0	3.0	
Lane Grp Cap (vph)	145	448				128	460	
v/s Ratio Prot		c0.19					0.18	
v/s Ratio Perm	0.01					0.01		
v/c Ratio	0.03	0.77				0.05	0.70	
Uniform Delay, d1	25.3	31.2				25.5	30.5	
Progression Factor	1.00	1.00				1.00	1.00	
Incremental Delay, d2	0.1	7.7				0.2	4.6	
Delay (s)	25.4	38.9				25.6	35.2	
Level of Service	C	D				C	D	
Approach Delay (s)		38.8					35.0	
Approach LOS		D					C	

### Intersection Summary

## Queues

Future (2022) Background AM

## 1: Highway 26-McKibbin Drive &amp; St Vincent Street-County Road 7

												
Lane Group	EBL2	EBL	NBL2	NBL	NBT	NBR	SBL	SBT	SEL	SET	NWL2	NWL
Lane Configurations												
Volume (vph)	1	1	1	69	27	8	40	43	4	312	3	3
Lane Group Flow (vph)	0	22	0	0	105	9	0	100	4	344	0	6
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm		Perm	Perm
Protected Phases		9			2			6		4		
Permitted Phases	9		2	2		2	6		4		8	8
Detector Phases	9	9	2	2	2	2	6	6	4	4	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio		0.14			0.13	0.01		0.10	0.02	0.77		0.04
Control Delay		28.2			11.2	7.1		10.4	23.8	43.0		24.2
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay		28.2			11.2	7.1		10.4	23.8	43.0		24.2
Queue Length 50th (m)		2.0			6.2	0.0		5.5	0.5	54.2		0.8
Queue Length 95th (m)		8.8			19.6	2.4		17.7	2.9	81.2		3.6
Internal Link Dist (m)		68.1			3576.0			763.0		331.6		
Turn Bay Length (m)												
Base Capacity (vph)		488			834	984		961	193	513		176
Starvation Cap Reductn		0			0	0		0	0	0		0
Spillback Cap Reductn		0			0	0		0	0	0		0
Storage Cap Reductn		0			0	0		0	0	0		0
Reduced v/c Ratio		0.05			0.13	0.01		0.10	0.02	0.67		0.03

## Intersection Summary

Cycle Length: 90

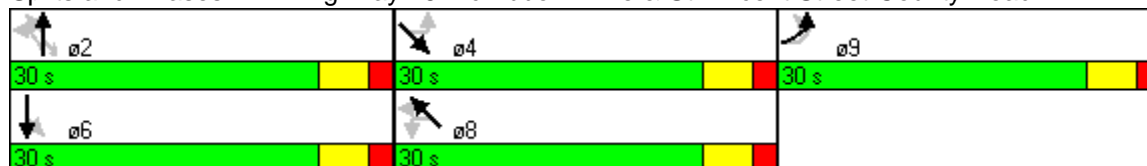
Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Splits and Phases: 1: Highway 26-McKibbin Drive &amp; St Vincent Street-County Road 7



















## 1: Highway 26-McKibbin Drive &amp; St Vincent Street-County Road 7



Lane Group	NWT
Lane Configurations	P
Volume (vph)	285
Lane Group Flow (vph)	323
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	8
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	30.0
Total Split (%)	33.3%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	0.70
Control Delay	38.7
Queue Delay	0.0
Total Delay	38.7
Queue Length 50th (m)	49.5
Queue Length 95th (m)	74.8
Internal Link Dist (m)	393.4
Turn Bay Length (m)	
Base Capacity (vph)	528
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.61
Intersection Summary	

## HCM Unsignalized Intersection Capacity Analysis 2: Highway 26 & Garden Centre Access-3rd Line










Future (2022) Background AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	316	7	4	249	0	14	0	3	1	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	343	8	4	271	0	15	0	3	1	0	1
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	271			351			630	629	347	632	633	271
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	271			351			630	629	347	632	633	271
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			96	100	100	100	100	100
cM capacity (veh/h)	1304			1219			395	400	700	393	398	773
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	352	275	18	2								
Volume Left	1	4	15	1								
Volume Right	8	0	3	1								
cSH	1304	1219	428	521								
Volume to Capacity	0.00	0.00	0.04	0.00								
Queue Length 95th (m)	0.0	0.1	1.0	0.1								
Control Delay (s)	0.0	0.2	13.8	11.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.0	0.2	13.8	11.9								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.5									
Intersection Capacity Utilization			27.6%	ICU Level of Service					A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 3: Sideroad 7 & 3rd Line

Future (2022) Background AM

















						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	1	0	7	12	9	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	0	8	13	10	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	39	11	12			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	39	11	12			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	973	1076	1620			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	1	21	12			
Volume Left	1	8	0			
Volume Right	0	0	2			
cSH	973	1620	1700			
Volume to Capacity	0.00	0.00	0.01			
Queue Length 95th (m)	0.0	0.1	0.0			
Control Delay (s)	8.7	2.7	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.7	2.7	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		1.9				
Intersection Capacity Utilization		16.8%		ICU Level of Service		A
Analysis Period (min)		15				



# HCM Unsignalized Intersection Capacity Analysis










## 4: Sideroad 7 & County Road 7

Future (2022) Background AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	1	9	0	4	1	9	54	0	0	59	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	1	10	0	4	1	10	59	0	0	64	1
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	146	143	65	153	143	59	65			59		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	146	143	65	153	143	59	65			59		
tC, single (s)	7.1	6.5	6.4	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.5	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	99	100	99	100	99			100		
cM capacity (veh/h)	819	747	946	805	747	1013	1550			1558		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	14	5	68	65								
Volume Left	3	0	10	0								
Volume Right	10	1	0	1								
cSH	896	788	1550	1558								
Volume to Capacity	0.02	0.01	0.01	0.00								
Queue Length 95th (m)	0.4	0.2	0.1	0.0								
Control Delay (s)	9.1	9.6	1.1	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	9.1	9.6	1.1	0.0								
Approach LOS	A	A										
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization		20.2%		ICU Level of Service						A		
Analysis Period (min)		15										

# HCM Unsignalized Intersection Capacity Analysis 5: Sideroad 10 & 3rd Line

















Future (2022) Background AM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	0	5	9	9	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	5	10	10	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	33	12	14			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	33	12	14			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	983	1075	1617			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	15	14			
Volume Left	0	5	0			
Volume Right	0	0	4			
cSH	1700	1617	1700			
Volume to Capacity	0.00	0.00	0.01			
Queue Length 95th (m)	0.0	0.1	0.0			
Control Delay (s)	0.0	2.6	0.0			
Lane LOS	A	A				
Approach Delay (s)	0.0	2.6	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			8.2%	ICU Level of Service	A	
Analysis Period (min)			15			

# HCM Signalized Intersection Capacity Analysis

Future (2022) Background PM

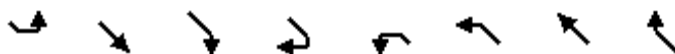
## 1: Highway 26-McKibbin Drive & St Vincent Street-Grey County Road 7

												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SBR2
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0		4.0		
Lane Util. Factor		1.00					1.00	1.00		1.00		
Frt		0.89					1.00	0.85		0.99		
Flt Protected		0.99					0.97	1.00		0.97		
Satd. Flow (prot)		1697					1866	1633		1801		
Flt Permitted		0.92					0.76	1.00		0.73		
Satd. Flow (perm)		1584					1462	1633		1360		
Volume (vph)	1	1	4	4	2	77	55	15	107	41	3	6
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	4	4	2	84	60	16	116	45	3	7
RTOR Reduction (vph)	0	4	0	0	0	0	0	9	0	1	0	0
Lane Group Flow (vph)	0	6	0	0	0	0	146	7	0	170	0	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	0%	0%
Turn Type	Perm				Perm	Perm		Perm	Perm			
Protected Phases		9					2			6		
Permitted Phases	9				2	2		2	6			
Actuated Green, G (s)		1.4					37.3	37.3		37.3		
Effective Green, g (s)		3.4					39.3	39.3		39.3		
Actuated g/C Ratio		0.04					0.44	0.44		0.44		
Clearance Time (s)		6.0					6.0	6.0		6.0		
Vehicle Extension (s)		3.0					3.0	3.0		3.0		
Lane Grp Cap (vph)		60					638	713		594		
v/s Ratio Prot												
v/s Ratio Perm		c0.00					0.10	0.00		c0.12		
v/c Ratio		0.10					0.23	0.01		0.29		
Uniform Delay, d1		41.8					15.9	14.3		16.3		
Progression Factor		1.00					1.00	1.00		1.00		
Incremental Delay, d2		0.8					0.8	0.0		1.2		
Delay (s)		42.6					16.7	14.4		17.5		
Level of Service		D					B	B		B		
Approach Delay (s)		42.6					16.5			17.5		
Approach LOS		D					B			B		
<b>Intersection Summary</b>												
HCM Average Control Delay		29.8					HCM Level of Service			C		
HCM Volume to Capacity ratio		0.55										
Actuated Cycle Length (s)		90.0					Sum of lost time (s)			12.0		
Intersection Capacity Utilization		61.0%					ICU Level of Service			B		
Analysis Period (min)		15										
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

Future (2022) Background PM

## 1: Highway 26-McKibbin Drive & St Vincent Street-Grey County Road 7






















Movement	SEL	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations								
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	1.00				1.00	1.00	
Frt	1.00	1.00				1.00	1.00	
Flt Protected	0.95	1.00				0.95	1.00	
Satd. Flow (prot)	1825	1894				1720	1895	
Flt Permitted	0.11	1.00				0.20	1.00	
Satd. Flow (perm)	218	1894				364	1895	
Volume (vph)	8	488	9	6	15	6	595	17
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	530	10	7	16	7	647	18
RTOR Reduction (vph)	0	1	0	0	0	0	1	0
Lane Group Flow (vph)	9	546	0	0	0	23	664	0
Heavy Vehicles (%)	0%	1%	0%	0%	0%	20%	1%	0%
Turn Type	Perm		Perm			Perm		
Protected Phases	4					8		
Permitted Phases	4		8			8		
Actuated Green, G (s)	33.3	33.3				33.3	33.3	
Effective Green, g (s)	35.3	35.3				35.3	35.3	
Actuated g/C Ratio	0.39	0.39				0.39	0.39	
Clearance Time (s)	6.0	6.0				6.0	6.0	
Vehicle Extension (s)	3.0	3.0				3.0	3.0	
Lane Grp Cap (vph)	86	743				143	743	
v/s Ratio Prot		0.29					c0.35	
v/s Ratio Perm	0.04					0.06		
v/c Ratio	0.10	0.74				0.16	0.89	
Uniform Delay, d1	17.3	23.4				17.7	25.6	
Progression Factor	1.00	1.00				1.00	1.00	
Incremental Delay, d2	0.5	3.8				0.5	13.1	
Delay (s)	17.9	27.2				18.3	38.7	
Level of Service	B	C				B	D	
Approach Delay (s)		27.0					38.0	
Approach LOS		C					D	

### Intersection Summary

## Queues

Future (2022) Background PM

## 1: Highway 26-McKibbon Drive &amp; St Vincent Street-Grey County Road 7

												
Lane Group	EBL2	EBL	NBL2	NBL	NBT	NBR	SBL	SBT	SEL	SET	NWL2	NWL
Lane Configurations												
Volume (vph)	1	1	2	77	55	15	107	41	8	488	15	6
Lane Group Flow (vph)	0	10	0	0	146	16	0	171	9	547	0	23
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm		Perm	Perm
Protected Phases		9			2			6		4		
Permitted Phases	9		2	2		2	6		4		8	8
Detector Phases	9	9	2	2	2	2	6	6	4	4	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	22.0	22.0	26.0	26.0	26.0	26.0	26.0	26.0	42.0	42.0	42.0	42.0
Total Split (%)	24.4%	24.4%	28.9%	28.9%	28.9%	28.9%	28.9%	28.9%	46.7%	46.7%	46.7%	46.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio		0.07			0.21	0.02		0.29	0.10	0.74		0.14
Control Delay		31.4			16.5	8.2		17.8	18.8	29.6		18.7
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay		31.4			16.5	8.2		17.8	18.8	29.6		18.7
Queue Length 50th (m)		1.0			13.7	0.0		16.6	0.9	74.6		2.4
Queue Length 95th (m)		5.7			33.0	4.1		39.8	4.1	110.5		7.6
Internal Link Dist (m)		68.1			774.4			763.0		331.6		
Turn Bay Length (m)												
Base Capacity (vph)		335			712	808		588	101	800		179
Starvation Cap Reductn		0			0	0		0	0	0		0
Spillback Cap Reductn		0			0	0		0	0	0		0
Storage Cap Reductn		0			0	0		0	0	0		0
Reduced v/c Ratio		0.03			0.21	0.02		0.29	0.09	0.68		0.13

## Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

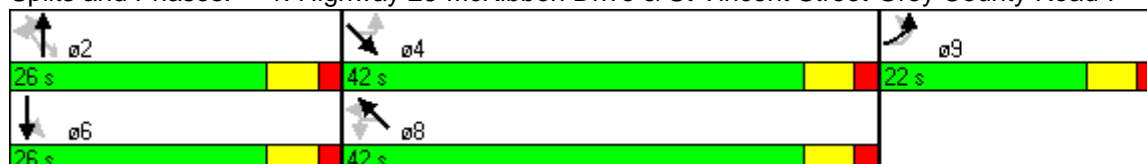
Natural Cycle: 80

Control Type: Actuated-Coordinated

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Highway 26-McKibbon Drive &amp; St Vincent Street-Grey County Road 7



















## 1: Highway 26-McKibbin Drive &amp; St Vincent Street-Grey County Road 7



Lane Group	NWT
Lane Configurations	P
Volume (vph)	595
Lane Group Flow (vph)	665
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	8
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	42.0
Total Split (%)	46.7%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	0.89
Control Delay	41.1
Queue Delay	0.0
Total Delay	41.1
Queue Length 50th (m)	99.3
Queue Length 95th (m)	159.8
Internal Link Dist (m)	393.4
Turn Bay Length (m)	
Base Capacity (vph)	801
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.83
Intersection Summary	










## HCM Unsignalized Intersection Capacity Analysis 2: Highway 26 & Garden Centre Access-3rd Line

Future (2022) Background PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	388	20	2	461	1	28	0	5	1	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	422	22	2	501	1	30	0	5	1	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								None			
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	502			443			941	941	433	946	952	502
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	502			443			941	941	433	946	952	502
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			88	100	99	100	100	100
cM capacity (veh/h)	1073			1127			245	264	627	241	261	574
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	445	504	36	1								
Volume Left	1	2	30	1								
Volume Right	22	1	5	0								
cSH	1073	1127	270	241								
Volume to Capacity	0.00	0.00	0.13	0.00								
Queue Length 95th (m)	0.0	0.0	3.4	0.1								
Control Delay (s)	0.0	0.1	20.4	20.0								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.0	0.1	20.4	20.0								
Approach LOS			C	C								
Intersection Summary												
Average Delay			0.8									
Intersection Capacity Utilization	35.8%		ICU Level of Service				A					
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis 3: Sideroad 7 & 3rd Line

















Future (2022) Background PM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	2	2	0	4	12	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	2	0	4	13	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	17	13	13			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	17	13	13			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	1006	1073	1619			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	4	4	13			
Volume Left	2	0	0			
Volume Right	2	0	0			
cSH	1038	1619	1700			
Volume to Capacity	0.00	0.00	0.01			
Queue Length 95th (m)	0.1	0.0	0.0			
Control Delay (s)	8.5	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	8.5	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		1.7				
Intersection Capacity Utilization		13.3%		ICU Level of Service		A
Analysis Period (min)		15				







# HCM Unsignalized Intersection Capacity Analysis 4: Sideroad 7 & Grey County 7

Future (2022) Background PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	1	0	0	0	1	3	40	0	0	41	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	1	0	0	0	1	3	43	0	0	45	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	98	97	47	97	99	43	49			43		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	98	97	47	97	99	43	49			43		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	100	100			100		
cM capacity (veh/h)	887	795	1028	887	793	1033	1571			1578		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	4	1	47	49								
Volume Left	3	0	3	0								
Volume Right	0	1	0	4								
cSH	862	1033	1571	1578								
Volume to Capacity	0.01	0.00	0.00	0.00								
Queue Length 95th (m)	0.1	0.0	0.0	0.0								
Control Delay (s)	9.2	8.5	0.5	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	9.2	8.5	0.5	0.0								
Approach LOS	A	A										
Intersection Summary												
Average Delay			0.7									
Intersection Capacity Utilization	14.6%			ICU Level of Service				A				
Analysis Period (min)	15											

# HCM Unsignalized Intersection Capacity Analysis 5: Sideroad 10 & 3rd Line







Future (2022) Background PM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	0	0	13	5	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	14	5	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	21	7	8			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	21	7	8			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	1001	1082	1626			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	14	8			
Volume Left	0	0	0			
Volume Right	0	0	2			
cSH	1700	1626	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service	A	
Analysis Period (min)			15			

# HCM Signalized Intersection Capacity Analysis

Future (2017) Background SAT

## 1: Highway 12-McKibbin Drive & St Vincent Street-Grey County Road 7

												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SEL
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0		4.0		4.0
Lane Util. Factor		1.00					1.00	1.00		1.00		1.00
Frt		0.88					1.00	0.85		1.00		1.00
Flt Protected		0.99					0.96	1.00		0.97		0.95
Satd. Flow (prot)		1687					1836	1633		1863		1825
Flt Permitted		0.95					0.75	1.00		0.81		0.30
Satd. Flow (perm)		1610					1425	1633		1557		579
Volume (vph)	1	1	5	6	2	86	27	8	57	41	2	4
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	5	7	2	93	29	9	62	45	2	4
RTOR Reduction (vph)	0	7	0	0	0	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	7	0	0	0	0	124	5	0	109	0	4
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%
Turn Type	Perm				Perm	Perm		Perm	Perm			Perm
Protected Phases		9					2			6		
Permitted Phases	9				2	2		2	6			4
Actuated Green, G (s)		1.4					50.4	50.4		50.4		20.2
Effective Green, g (s)		3.4					52.4	52.4		52.4		22.2
Actuated g/C Ratio		0.04					0.58	0.58		0.58		0.25
Clearance Time (s)		6.0					6.0	6.0		6.0		6.0
Vehicle Extension (s)		3.0					3.0	3.0		3.0		3.0
Lane Grp Cap (vph)		61					830	951		907		143
v/s Ratio Prot												
v/s Ratio Perm		c0.00					c0.09	0.00		0.07		0.01
v/c Ratio		0.12					0.15	0.01		0.12		0.03
Uniform Delay, d1		41.9					8.6	7.9		8.4		25.7
Progression Factor		1.00					1.00	1.00		1.00		1.00
Incremental Delay, d2		0.9					0.4	0.0		0.3		0.1
Delay (s)		42.7					9.0	7.9		8.7		25.8
Level of Service		D					A	A		A		C
Approach Delay (s)		42.7					8.9			8.7		
Approach LOS		D					A			A		
<b>Intersection Summary</b>												
HCM Average Control Delay		29.0					HCM Level of Service			C		
HCM Volume to Capacity ratio		0.32										
Actuated Cycle Length (s)		90.0					Sum of lost time (s)			12.0		
Intersection Capacity Utilization		42.6%					ICU Level of Service			A		
Analysis Period (min)		15										
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

Future (2017) Background SAT

## 1: Highway 12-McKibbin Drive & St Vincent Street-Grey County Road 7



Movement	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations							
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0				4.0	4.0	
Lane Util. Factor	1.00				1.00	1.00	
Frt	0.99				1.00	0.99	
Flt Protected	1.00				0.95	1.00	
Satd. Flow (prot)	1902				1825	1903	
Flt Permitted	1.00				0.24	1.00	
Satd. Flow (perm)	1902				466	1903	
Volume (vph)	306	12	5	1	5	279	12
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	333	13	5	1	5	303	13
RTOR Reduction (vph)	1	0	0	0	0	2	0
Lane Group Flow (vph)	350	0	0	0	6	314	0
Heavy Vehicles (%)	0%	6%	0%	0%	0%	0%	8%
Turn Type				Perm	Perm		
Protected Phases	4					8	
Permitted Phases				8	8		
Actuated Green, G (s)	20.2				20.2	20.2	
Effective Green, g (s)	22.2				22.2	22.2	
Actuated g/C Ratio	0.25				0.25	0.25	
Clearance Time (s)	6.0				6.0	6.0	
Vehicle Extension (s)	3.0				3.0	3.0	
Lane Grp Cap (vph)	469				115	469	
v/s Ratio Prot	0.18					0.17	
v/s Ratio Perm					0.01		
v/c Ratio	0.75				0.05	0.67	
Uniform Delay, d1	31.3				25.9	30.6	
Progression Factor	1.00				1.00	1.00	
Incremental Delay, d2	6.4				0.2	3.7	
Delay (s)	37.7				26.1	34.3	
Level of Service	D				C	C	
Approach Delay (s)	37.6					34.2	
Approach LOS	D					C	

### Intersection Summary

## Queues

Future (2017) Background SAT

## 1: Highway 12-McKibbin Drive &amp; St Vincent Street-Grey County Road 7



Lane Group	EBL2	EBL	NBL2	NBL	NBT	NBR	SBL	SBT	SEL	SET	NWL2	NWL
Lane Configurations												
Volume (vph)	1	1	2	86	27	8	57	41	4	306	1	5
Lane Group Flow (vph)	0	14	0	0	124	9	0	109	4	351	0	6
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm		Perm	Perm
Protected Phases		9			2			6		4		
Permitted Phases	9		2	2		2	6		4		8	8
Detector Phases	9	9	2	2	2	2	6	6	4	4	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio		0.09			0.14	0.01		0.11	0.02	0.75		0.04
Control Delay		28.5			9.2	6.0		9.1	23.8	41.1		24.3
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay		28.5			9.2	6.0		9.1	23.8	41.1		24.3
Queue Length 50th (m)		1.1			7.1	0.0		6.2	0.5	55.4		0.8
Queue Length 95th (m)		6.6			22.1	2.4		19.6	2.9	80.9		3.6
Internal Link Dist (m)		68.1			781.4			763.0		331.6		
Turn Bay Length (m)												
Base Capacity (vph)		487			902	1039		963	199	550		170
Starvation Cap Reductn		0			0	0		0	0	0		0
Spillback Cap Reductn		0			0	0		0	0	0		0
Storage Cap Reductn		0			0	0		0	0	0		0
Reduced v/c Ratio		0.03			0.14	0.01		0.11	0.02	0.64		0.04

## Intersection Summary

Cycle Length: 90

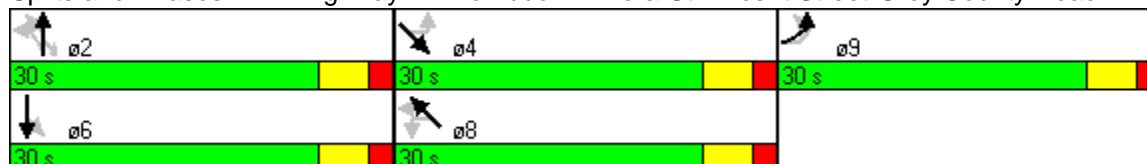
Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Splits and Phases: 1: Highway 12-McKibbin Drive &amp; St Vincent Street-Grey County Road 7



















## 1: Highway 12-McKibbin Drive &amp; St Vincent Street-Grey County Road 7



Lane Group	NWT
Lane Configurations	P
Volume (vph)	279
Lane Group Flow (vph)	316
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	8
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	30.0
Total Split (%)	33.3%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	0.67
Control Delay	37.3
Queue Delay	0.0
Total Delay	37.3
Queue Length 50th (m)	48.5
Queue Length 95th (m)	72.1
Internal Link Dist (m)	393.4
Turn Bay Length (m)	
Base Capacity (vph)	551
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.57
Intersection Summary	

## HCM Unsignalized Intersection Capacity Analysis 2: Highway 26 & Garden Centre Access-3rd Line










Future (2017) Background SAT

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	4	372	16	7	381	0	22	0	10	1	0	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	404	17	8	414	0	24	0	11	1	0	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	414			422			855	851	413	862	860	414
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	414			422			855	851	413	862	860	414
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			91	100	98	100	100	99
cM capacity (veh/h)	1156			1148			276	296	643	271	293	642
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	426	422	35	5								
Volume Left	4	8	24	1								
Volume Right	17	0	11	4								
cSH	1156	1148	336	504								
Volume to Capacity	0.00	0.01	0.10	0.01								
Queue Length 95th (m)	0.1	0.2	2.6	0.2								
Control Delay (s)	0.1	0.2	16.9	12.2								
Lane LOS	A	A	C	B								
Approach Delay (s)	0.1	0.2	16.9	12.2								
Approach LOS			C	B								
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization			36.1%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 3: Sideroad 7 & 3rd Line

Future (2017) Background SAT

















						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	9	5	0	7	15	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	5	0	8	16	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	24	16	16			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	24	16	16			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	997	1069	1614			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	15	8	16			
Volume Left	10	0	0			
Volume Right	5	0	0			
cSH	1022	1614	1700			
Volume to Capacity	0.01	0.00	0.01			
Queue Length 95th (m)	0.3	0.0	0.0			
Control Delay (s)	8.6	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	8.6	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		3.3				
Intersection Capacity Utilization		13.3%		ICU Level of Service		A
Analysis Period (min)		15				



# HCM Unsignalized Intersection Capacity Analysis










## 4: Sideroad 7 & Grey County 7

Future (2017) Background SAT

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	6	1	3	0	1	1	6	81	0	2	70	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	1	3	0	1	1	7	88	0	2	76	10
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	188	186	81	190	191	88	86			88		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	188	186	81	190	191	88	86			88		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	100	100	100	100			100		
cM capacity (veh/h)	772	708	985	767	703	976	1523			1520		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	11	2	95	88								
Volume Left	7	0	7	2								
Volume Right	3	1	0	10								
cSH	817	817	1523	1520								
Volume to Capacity	0.01	0.00	0.00	0.00								
Queue Length 95th (m)	0.3	0.1	0.1	0.0								
Control Delay (s)	9.5	9.4	0.5	0.2								
Lane LOS	A	A	A	A								
Approach Delay (s)	9.5	9.4	0.5	0.2								
Approach LOS	A	A										
Intersection Summary												
Average Delay			1.0									
Intersection Capacity Utilization			19.7%		ICU Level of Service					A		
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis 5: Sideroad 10 & 3rd Line

Future (2017) Background SAT






						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	0	5	11	18	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	5	12	20	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	45	22	24			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	45	22	24			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	968	1061	1604			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	17	24			
Volume Left	0	5	0			
Volume Right	0	0	4			
cSH	1700	1604	1700			
Volume to Capacity	0.00	0.00	0.01			
Queue Length 95th (m)	0.0	0.1	0.0			
Control Delay (s)	0.0	2.3	0.0			
Lane LOS	A	A				
Approach Delay (s)	0.0	2.3	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			8.3%	ICU Level of Service	A	
Analysis Period (min)			15			

**APPENDIX F**  
**Future (2028) Total Traffic Background Conditions**  
**Analysis Outputs**  
Level of Service Calculations

# HCM Signalized Intersection Capacity Analysis

Future (2028) Background AM

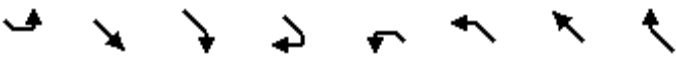




## 1: Highway 26-McKibbin Drive & St Vincent Street-County Road 7

												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SBR2
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0		4.0		
Lane Util. Factor		1.00					1.00	1.00		1.00		
Frt		0.88					1.00	0.85		0.99		
Flt Protected		1.00					0.97	1.00		0.98		
Satd. Flow (prot)		1678					1748	1633		1836		
Flt Permitted		0.97					0.78	1.00		0.87		
Satd. Flow (perm)		1628					1406	1633		1637		
Volume (vph)	1	1	9	9	1	69	30	8	40	48	1	8
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	10	10	1	75	33	9	43	52	1	9
RTOR Reduction (vph)	0	9	0	0	0	0	0	4	0	2	0	0
Lane Group Flow (vph)	0	13	0	0	0	0	109	5	0	103	0	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	9%	0%	0%	3%	0%	0%	0%
Turn Type	Perm				Perm		Perm	Perm	Perm	Perm		
Protected Phases		9					2			6		
Permitted Phases	9				2	2		2	6			
Actuated Green, G (s)		2.9					47.2	47.2		47.2		
Effective Green, g (s)		4.9					49.2	49.2		49.2		
Actuated g/C Ratio		0.05					0.55	0.55		0.55		
Clearance Time (s)		6.0					6.0	6.0		6.0		
Vehicle Extension (s)		3.0					3.0	3.0		3.0		
Lane Grp Cap (vph)		89					769	893		895		
v/s Ratio Prot												
v/s Ratio Perm		c0.01					c0.08	0.00		0.06		
v/c Ratio		0.14					0.14	0.01		0.11		
Uniform Delay, d1		40.5					10.0	9.3		9.9		
Progression Factor		1.00					1.00	1.00		1.00		
Incremental Delay, d2		0.7					0.4	0.0		0.3		
Delay (s)		41.3					10.4	9.3		10.1		
Level of Service		D					B	A		B		
Approach Delay (s)		41.3					10.3			10.1		
Approach LOS		D					B			B		
<b>Intersection Summary</b>												
HCM Average Control Delay		32.6					HCM Level of Service			C		
HCM Volume to Capacity ratio		0.35										
Actuated Cycle Length (s)		90.0					Sum of lost time (s)			12.0		
Intersection Capacity Utilization		44.1%					ICU Level of Service			A		
Analysis Period (min)		15										
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

Future (2028) Background AM




















## 1: Highway 26-McKibbin Drive & St Vincent Street-County Road 7

								
Movement	SEL	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations								
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	1.00				1.00	1.00	
Frt	1.00	1.00				1.00	0.99	
Flt Protected	0.95	1.00				0.95	1.00	
Satd. Flow (prot)	1825	1777				1825	1823	
Flt Permitted	0.26	1.00				0.22	1.00	
Satd. Flow (perm)	493	1777				420	1823	
Volume (vph)	4	351	3	2	3	3	321	12
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	382	3	2	3	3	349	13
RTOR Reduction (vph)	0	0	0	0	0	0	1	0
Lane Group Flow (vph)	4	387	0	0	0	6	361	0
Heavy Vehicles (%)	0%	8%	0%	0%	0%	0%	5%	0%
Turn Type	Perm				Perm		Perm	
Protected Phases		4					8	
Permitted Phases	4				8	8		
Actuated Green, G (s)	21.9	21.9				21.9	21.9	
Effective Green, g (s)	23.9	23.9				23.9	23.9	
Actuated g/C Ratio	0.27	0.27				0.27	0.27	
Clearance Time (s)	6.0	6.0				6.0	6.0	
Vehicle Extension (s)	3.0	3.0				3.0	3.0	
Lane Grp Cap (vph)	131	472				112	484	
v/s Ratio Prot		c0.22					0.20	
v/s Ratio Perm	0.01					0.01		
v/c Ratio	0.03	0.82				0.05	0.74	
Uniform Delay, d1	24.5	31.0				24.6	30.3	
Progression Factor	1.00	1.00				1.00	1.00	
Incremental Delay, d2	0.1	10.7				0.2	6.1	
Delay (s)	24.6	41.7				24.8	36.4	
Level of Service	C	D				C	D	
Approach Delay (s)		41.5					36.2	
Approach LOS		D					D	
Intersection Summary								

## Queues

Future (2028) Background AM

## 1: Highway 26-McKibbon Drive &amp; St Vincent Street-County Road 7

												
Lane Group	EBL2	EBL	NBL2	NBL	NBT	NBR	SBL	SBT	SEL	SET	NWL2	NWL
Lane Configurations												
Volume (vph)	1	1	1	69	30	8	40	48	4	351	3	3
Lane Group Flow (vph)	0	22	0	0	109	9	0	105	4	387	0	6
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm		Perm	Perm
Protected Phases		9			2			6		4		
Permitted Phases	9		2	2		2	6		4		8	8
Detector Phases	9	9	2	2	2	2	6	6	4	4	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio		0.14			0.13	0.01		0.11	0.03	0.82		0.05
Control Delay		28.2			11.5	7.1		10.7	23.8	46.0		24.3
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay		28.2			11.5	7.1		10.7	23.8	46.0		24.3
Queue Length 50th (m)		2.0			7.0	0.0		6.3	0.5	60.6		0.8
Queue Length 95th (m)		8.8			20.1	2.4		18.6	2.9	#100.4		3.6
Internal Link Dist (m)		68.1			3576.0			763.0		331.6		
Turn Bay Length (m)												
Base Capacity (vph)		488			826	961		944	161	513		142
Starvation Cap Reductn		0			0	0		0	0	0		0
Spillback Cap Reductn		0			0	0		0	0	0		0
Storage Cap Reductn		0			0	0		0	0	0		0
Reduced v/c Ratio		0.05			0.13	0.01		0.11	0.02	0.75		0.04

## Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

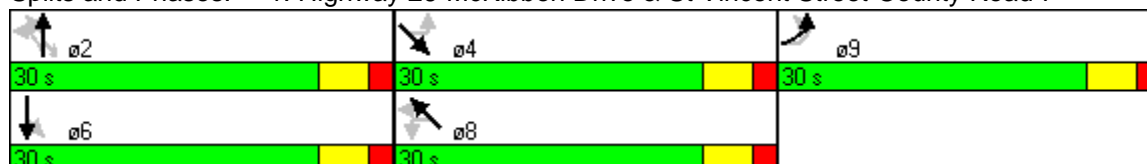
Natural Cycle: 70

Control Type: Actuated-Coordinated

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Highway 26-McKibbon Drive &amp; St Vincent Street-County Road 7



















## 1: Highway 26-McKibbin Drive &amp; St Vincent Street-County Road 7



Lane Group	NWT
Lane Configurations	P
Volume (vph)	321
Lane Group Flow (vph)	362
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	8
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	30.0
Total Split (%)	33.3%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	0.74
Control Delay	40.0
Queue Delay	0.0
Total Delay	40.0
Queue Length 50th (m)	55.0
Queue Length 95th (m)	84.9
Internal Link Dist (m)	393.4
Turn Bay Length (m)	
Base Capacity (vph)	528
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.69
Intersection Summary	

## HCM Unsignalized Intersection Capacity Analysis 2: Highway 26 & Garden Centre Access-3rd Line





Future (2028) Background AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	355	7	4	279	0	14	0	3	1	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	386	8	4	303	0	15	0	3	1	0	1
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	303			393			705	704	390	707	708	303
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	303			393			705	704	390	707	708	303
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			96	100	100	100	100	100
cM capacity (veh/h)	1269			1176			352	362	663	350	361	741
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	395	308	18	2								
Volume Left	1	4	15	1								
Volume Right	8	0	3	1								
cSH	1269	1176	384	475								
Volume to Capacity	0.00	0.00	0.05	0.00								
Queue Length 95th (m)	0.0	0.1	1.1	0.1								
Control Delay (s)	0.0	0.1	14.9	12.6								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.0	0.1	14.9	12.6								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.5									
Intersection Capacity Utilization			29.7%		ICU Level of Service					A		
Analysis Period (min)			15									



# HCM Unsignalized Intersection Capacity Analysis 3: Sideroad 7 & 3rd Line

















Future (2028) Background AM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	1	0	7	12	9	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	0	8	13	10	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	39	11	12			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	39	11	12			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	973	1076	1620			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	1	21	12			
Volume Left	1	8	0			
Volume Right	0	0	2			
cSH	973	1620	1700			
Volume to Capacity	0.00	0.00	0.01			
Queue Length 95th (m)	0.0	0.1	0.0			
Control Delay (s)	8.7	2.7	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.7	2.7	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.9			
Intersection Capacity Utilization	16.8%		ICU Level of Service	A		
Analysis Period (min)	15					

# HCM Unsignalized Intersection Capacity Analysis





## 4: Sideroad 7 & County Road 7

Future (2028) Background AM

















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	1	9	0	4	1	9	60	0	0	66	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	1	10	0	4	1	10	65	0	0	72	1
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	160	157	72	167	158	65	73			65		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	160	157	72	167	158	65	73			65		
tC, single (s)	7.1	6.5	6.4	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.5	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	99	100	99	100	99			100		
cM capacity (veh/h)	801	734	937	788	733	1004	1540			1550		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	14	5	75	73								
Volume Left	3	0	10	0								
Volume Right	10	1	0	1								
cSH	884	775	1540	1550								
Volume to Capacity	0.02	0.01	0.01	0.00								
Queue Length 95th (m)	0.4	0.2	0.1	0.0								
Control Delay (s)	9.1	9.7	1.0	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	9.1	9.7	1.0	0.0								
Approach LOS	A	A										
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			20.5%		ICU Level of Service					A		
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis 5: Sideroad 10 & 3rd Line

Future (2028) Background AM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	0	5	9	9	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	5	10	10	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	33	12	14			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	33	12	14			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	983	1075	1617			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	15	14			
Volume Left	0	5	0			
Volume Right	0	0	4			
cSH	1700	1617	1700			
Volume to Capacity	0.00	0.00	0.01			
Queue Length 95th (m)	0.0	0.1	0.0			
Control Delay (s)	0.0	2.6	0.0			
Lane LOS	A	A				
Approach Delay (s)	0.0	2.6	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			8.2%		ICU Level of Service	
Analysis Period (min)			15		A	

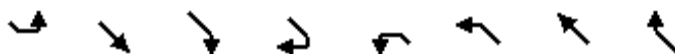
1: Highway 26-McKibbin Drive & St Vincent Street-Grey County Road 7

												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SBR2
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0		4.0		
Lane Util. Factor		1.00					1.00	1.00		1.00		
Frt		0.89					1.00	0.85		0.99		
Flt Protected		0.99					0.97	1.00		0.97		
Satd. Flow (prot)		1697					1869	1633		1799		
Flt Permitted		0.92					0.76	1.00		0.73		
Satd. Flow (perm)		1584					1469	1633		1360		
Volume (vph)	1	1	4	4	2	77	62	15	107	47	3	6
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	4	4	2	84	67	16	116	51	3	7
RTOR Reduction (vph)	0	4	0	0	0	0	0	9	0	1	0	0
Lane Group Flow (vph)	0	6	0	0	0	0	153	7	0	176	0	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	0%	0%
Turn Type	Perm				Perm	Perm		Perm	Perm			
Protected Phases		9					2			6		
Permitted Phases	9				2	2		2	6			
Actuated Green, G (s)		1.4					35.3	35.3		35.3		
Effective Green, g (s)		3.4					37.3	37.3		37.3		
Actuated g/C Ratio		0.04					0.41	0.41		0.41		
Clearance Time (s)		6.0					6.0	6.0		6.0		
Vehicle Extension (s)		3.0					3.0	3.0		3.0		
Lane Grp Cap (vph)		60					609	677		564		
v/s Ratio Prot												
v/s Ratio Perm		c0.00					0.10	0.00		c0.13		
v/c Ratio		0.10					0.25	0.01		0.31		
Uniform Delay, d1		41.8					17.2	15.5		17.7		
Progression Factor		1.00					1.00	1.00		1.00		
Incremental Delay, d2		0.8					1.0	0.0		1.4		
Delay (s)		42.6					18.2	15.5		19.2		
Level of Service		D					B	B		B		
Approach Delay (s)		42.6					18.0			19.2		
Approach LOS		D					B			B		
<b>Intersection Summary</b>												
HCM Average Control Delay		33.4					HCM Level of Service			C		
HCM Volume to Capacity ratio		0.61										
Actuated Cycle Length (s)		90.0					Sum of lost time (s)			12.0		
Intersection Capacity Utilization		65.2%					ICU Level of Service			C		
Analysis Period (min)		15										
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

Future (2028) Background PM

## 1: Highway 26-McKibbin Drive & St Vincent Street-Grey County Road 7






















Movement	SEL	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations								
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	1.00				1.00	1.00	
Frt	1.00	1.00				1.00	1.00	
Flt Protected	0.95	1.00				0.95	1.00	
Satd. Flow (prot)	1825	1895				1720	1896	
Flt Permitted	0.11	1.00				0.16	1.00	
Satd. Flow (perm)	206	1895				296	1896	
Volume (vph)	8	548	9	6	15	6	669	17
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	596	10	7	16	7	727	18
RTOR Reduction (vph)	0	1	0	0	0	0	1	0
Lane Group Flow (vph)	9	612	0	0	0	23	744	0
Heavy Vehicles (%)	0%	1%	0%	0%	0%	20%	1%	0%
Turn Type	Perm				Perm		Perm	
Protected Phases		4					8	
Permitted Phases	4				8	8		
Actuated Green, G (s)	35.3	35.3				35.3	35.3	
Effective Green, g (s)	37.3	37.3				37.3	37.3	
Actuated g/C Ratio	0.41	0.41				0.41	0.41	
Clearance Time (s)	6.0	6.0				6.0	6.0	
Vehicle Extension (s)	3.0	3.0				3.0	3.0	
Lane Grp Cap (vph)	85	785				123	786	
v/s Ratio Prot		0.32					c0.39	
v/s Ratio Perm	0.04					0.08		
v/c Ratio	0.11	0.78				0.19	0.95	
Uniform Delay, d1	16.1	22.8				16.7	25.4	
Progression Factor	1.00	1.00				1.00	1.00	
Incremental Delay, d2	0.6	5.0				0.7	20.0	
Delay (s)	16.7	27.8				17.5	45.4	
Level of Service	B	C				B	D	
Approach Delay (s)		27.7					44.5	
Approach LOS		C					D	

### Intersection Summary

## Queues

Future (2028) Background PM

## 1: Highway 26-McKibbon Drive &amp; St Vincent Street-Grey County Road 7

												
Lane Group	EBL2	EBL	NBL2	NBL	NBT	NBR	SBL	SBT	SEL	SET	NWL2	NWL
Lane Configurations												
Volume (vph)	1	1	2	77	62	15	107	47	8	548	15	6
Lane Group Flow (vph)	0	10	0	0	153	16	0	177	9	613	0	23
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm		Perm	Perm
Protected Phases		9			2			6		4		
Permitted Phases	9		2	2		2	6		4		8	8
Detector Phases	9	9	2	2	2	2	6	6	4	4	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	22.0	22.0	26.0	26.0	26.0	26.0	26.0	26.0	42.0	42.0	42.0	42.0
Total Split (%)	24.4%	24.4%	28.9%	28.9%	28.9%	28.9%	28.9%	28.9%	46.7%	46.7%	46.7%	46.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio		0.07			0.22	0.02		0.32	0.11	0.78		0.18
Control Delay		31.4			17.1	8.2		18.7	19.8	30.9		20.7
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay		31.4			17.1	8.2		18.7	19.8	30.9		20.7
Queue Length 50th (m)		1.0			14.4	0.0		17.4	0.9	88.0		2.4
Queue Length 95th (m)		5.7			34.5	4.1		41.5	4.3	129.7		8.2
Internal Link Dist (m)		68.1			774.4			763.0		331.6		
Turn Bay Length (m)												
Base Capacity (vph)		335			682	773		554	85	801		131
Starvation Cap Reductn		0			0	0		0	0	0		0
Spillback Cap Reductn		0			0	0		0	0	0		0
Storage Cap Reductn		0			0	0		0	0	0		0
Reduced v/c Ratio		0.03			0.22	0.02		0.32	0.11	0.77		0.18

## Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

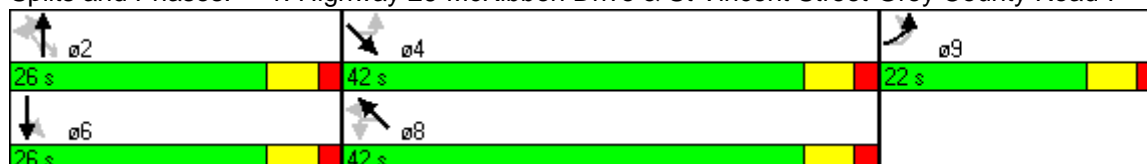
Natural Cycle: 80

Control Type: Actuated-Coordinated

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Highway 26-McKibbon Drive &amp; St Vincent Street-Grey County Road 7



















## 1: Highway 26-McKibbin Drive &amp; St Vincent Street-Grey County Road 7



Lane Group	NWT
Lane Configurations	P
Volume (vph)	669
Lane Group Flow (vph)	745
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	8
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	42.0
Total Split (%)	46.7%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	0.95
Control Delay	48.2
Queue Delay	0.0
Total Delay	48.2
Queue Length 50th (m)	118.9
Queue Length 95th (m)	191.7
Internal Link Dist (m)	393.4
Turn Bay Length (m)	
Base Capacity (vph)	801
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.93
Intersection Summary	

## HCM Unsignalized Intersection Capacity Analysis 2: Highway 26 & Garden Centre Access-3rd Line





Future (2028) Background PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	436	20	2	518	1	28	0	5	1	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	474	22	2	563	1	30	0	5	1	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	564			496			1055	1055	485	1060	1066	564
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	564			496			1055	1055	485	1060	1066	564
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			85	100	99	99	100	100
cM capacity (veh/h)	1018			1079			205	227	586	201	223	529
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	497	566	36	1								
Volume Left	1	2	30	1								
Volume Right	22	1	5	0								
cSH	1018	1079	227	201								
Volume to Capacity	0.00	0.00	0.16	0.01								
Queue Length 95th (m)	0.0	0.0	4.2	0.1								
Control Delay (s)	0.0	0.1	23.8	23.0								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.0	0.1	23.8	23.0								
Approach LOS			C	C								
Intersection Summary												
Average Delay			0.8									
Intersection Capacity Utilization			38.8%	ICU Level of Service					A			
Analysis Period (min)			15									



# HCM Unsignalized Intersection Capacity Analysis 3: Sideroad 7 & 3rd Line

















Future (2028) Background PM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	2	2	0	4	12	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	2	0	4	13	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	17	13	13			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	17	13	13			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	1006	1073	1619			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	4	4	13			
Volume Left	2	0	0			
Volume Right	2	0	0			
cSH	1038	1619	1700			
Volume to Capacity	0.00	0.00	0.01			
Queue Length 95th (m)	0.1	0.0	0.0			
Control Delay (s)	8.5	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	8.5	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.7			
Intersection Capacity Utilization	13.3%		ICU Level of Service	A		
Analysis Period (min)	15					

# HCM Unsignalized Intersection Capacity Analysis





## 4: Sideroad 7 & Grey County 7

Future (2028) Background PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	1	0	0	0	1	3	45	0	0	47	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	1	0	0	0	1	3	49	0	0	51	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	110	109	53	109	111	49	55			49		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	110	109	53	109	111	49	55			49		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	100	100			100		
cM capacity (veh/h)	871	784	1020	872	781	1025	1562			1571		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	4	1	52	55								
Volume Left	3	0	3	0								
Volume Right	0	1	0	4								
cSH	847	1025	1562	1571								
Volume to Capacity	0.01	0.00	0.00	0.00								
Queue Length 95th (m)	0.1	0.0	0.0	0.0								
Control Delay (s)	9.3	8.5	0.5	0.0								
Lane LOS	A	A	A									
Approach Delay (s)	9.3	8.5	0.5	0.0								
Approach LOS	A	A										
Intersection Summary												
Average Delay			0.7									
Intersection Capacity Utilization			14.8%			ICU Level of Service				A		
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis 5: Sideroad 10 & 3rd Line







Future (2028) Background PM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	0	0	13	5	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	14	5	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	21	7	8			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	21	7	8			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	1001	1082	1626			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	14	8			
Volume Left	0	0	0			
Volume Right	0	0	2			
cSH	1700	1626	1700			
Volume to Capacity	0.00	0.00	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			6.7%	ICU Level of Service	A	
Analysis Period (min)			15			

# HCM Signalized Intersection Capacity Analysis

Future (2028) Background SAT

## 1: Highway 12-McKibbin Drive & St Vincent Street-Grey County Road 7

												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SEL
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0		4.0		4.0
Lane Util. Factor		1.00					1.00	1.00		1.00		1.00
Frt		0.88					1.00	0.85		1.00		1.00
Flt Protected		0.99					0.96	1.00		0.97		0.95
Satd. Flow (prot)		1687					1839	1633		1866		1825
Flt Permitted		0.95					0.75	1.00		0.82		0.26
Satd. Flow (perm)		1610					1429	1633		1568		497
Volume (vph)	1	1	5	6	2	86	30	8	57	47	2	4
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	5	7	2	93	33	9	62	51	2	4
RTOR Reduction (vph)	0	7	0	0	0	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	7	0	0	0	0	128	5	0	115	0	4
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%
Turn Type	Perm				Perm	Perm		Perm	Perm			Perm
Protected Phases		9					2			6		
Permitted Phases	9				2	2		2	6			4
Actuated Green, G (s)		1.4					49.3	49.3		49.3		21.3
Effective Green, g (s)		3.4					51.3	51.3		51.3		23.3
Actuated g/C Ratio		0.04					0.57	0.57		0.57		0.26
Clearance Time (s)		6.0					6.0	6.0		6.0		6.0
Vehicle Extension (s)		3.0					3.0	3.0		3.0		3.0
Lane Grp Cap (vph)		61					815	931		894		129
v/s Ratio Prot												
v/s Ratio Perm		c0.00					c0.09	0.00		0.07		0.01
v/c Ratio		0.12					0.16	0.01		0.13		0.03
Uniform Delay, d1		41.9					9.1	8.3		9.0		24.9
Progression Factor		1.00					1.00	1.00		1.00		1.00
Incremental Delay, d2		0.9					0.4	0.0		0.3		0.1
Delay (s)		42.7					9.5	8.4		9.3		25.0
Level of Service		D					A	A		A		C
Approach Delay (s)		42.7					9.5			9.3		
Approach LOS		D					A			A		
Intersection Summary												
HCM Average Control Delay		30.6					HCM Level of Service			C		
HCM Volume to Capacity ratio		0.35										
Actuated Cycle Length (s)		90.0					Sum of lost time (s)			12.0		
Intersection Capacity Utilization		44.9%					ICU Level of Service			A		
Analysis Period (min)		15										
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

Future (2028) Background SAT

## 1: Highway 12-McKibbin Drive & St Vincent Street-Grey County Road 7



Movement	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations	1				2	1	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0				4.0	4.0	
Lane Util. Factor	1.00				1.00	1.00	
Frt	0.99				1.00	0.99	
Flt Protected	1.00				0.95	1.00	
Satd. Flow (prot)	1904				1825	1905	
Flt Permitted	1.00				0.20	1.00	
Satd. Flow (perm)	1904				382	1905	
Volume (vph)	344	12	5	1	5	314	12
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	374	13	5	1	5	341	13
RTOR Reduction (vph)	1	0	0	0	0	1	0
Lane Group Flow (vph)	391	0	0	0	6	353	0
Heavy Vehicles (%)	0%	6%	0%	0%	0%	0%	8%
Turn Type				Perm	Perm		
Protected Phases	4					8	
Permitted Phases				8	8		
Actuated Green, G (s)	21.3				21.3	21.3	
Effective Green, g (s)	23.3				23.3	23.3	
Actuated g/C Ratio	0.26				0.26	0.26	
Clearance Time (s)	6.0				6.0	6.0	
Vehicle Extension (s)	3.0				3.0	3.0	
Lane Grp Cap (vph)	493				99	493	
v/s Ratio Prot	0.21					0.19	
v/s Ratio Perm					0.02		
v/c Ratio	0.79				0.06	0.72	
Uniform Delay, d1	31.1				25.1	30.3	
Progression Factor	1.00				1.00	1.00	
Incremental Delay, d2	8.6				0.3	4.9	
Delay (s)	39.7				25.4	35.2	
Level of Service	D				C	D	
Approach Delay (s)	39.5					35.1	
Approach LOS	D					D	

### Intersection Summary

## Queues

Future (2028) Background SAT

## 1: Highway 12-McKibbin Drive &amp; St Vincent Street-Grey County Road 7



Lane Group	EBL2	EBL	NBL2	NBL	NBT	NBR	SBL	SBT	SEL	SET	NWL2	NWL
Lane Configurations												
Volume (vph)	1	1	2	86	30	8	57	47	4	344	1	5
Lane Group Flow (vph)	0	14	0	0	128	9	0	115	4	392	0	6
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm		Perm	Perm
Protected Phases		9			2			6		4		
Permitted Phases	9		2	2		2	6		4		8	8
Detector Phases	9	9	2	2	2	2	6	6	4	4	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio		0.09			0.14	0.01		0.12	0.03	0.79		0.05
Control Delay		28.5			9.6	6.0		9.4	23.8	43.2		24.5
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay		28.5			9.6	6.0		9.4	23.8	43.2		24.5
Queue Length 50th (m)		1.1			8.1	0.0		7.2	0.5	61.1		0.8
Queue Length 95th (m)		6.6			22.8	2.4		20.5	2.9	91.7		3.7
Internal Link Dist (m)		68.1			781.4			763.0		331.6		
Turn Bay Length (m)												
Base Capacity (vph)		487			884	1020		951	168	551		138
Starvation Cap Reductn		0			0	0		0	0	0		0
Spillback Cap Reductn		0			0	0		0	0	0		0
Storage Cap Reductn		0			0	0		0	0	0		0
Reduced v/c Ratio		0.03			0.14	0.01		0.12	0.02	0.71		0.04

## Intersection Summary

Cycle Length: 90

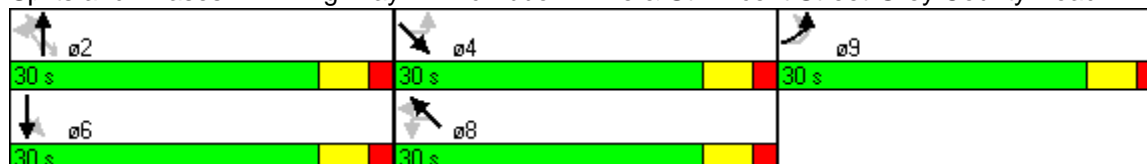
Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Splits and Phases: 1: Highway 12-McKibbin Drive &amp; St Vincent Street-Grey County Road 7



















## 1: Highway 12-McKibbin Drive &amp; St Vincent Street-Grey County Road 7



Lane Group	NWT
Lane Configurations	P
Volume (vph)	314
Lane Group Flow (vph)	354
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	8
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	30.0
Total Split (%)	33.3%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	0.72
Control Delay	38.5
Queue Delay	0.0
Total Delay	38.5
Queue Length 50th (m)	53.6
Queue Length 95th (m)	81.5
Internal Link Dist (m)	393.4
Turn Bay Length (m)	
Base Capacity (vph)	551
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.64
Intersection Summary	

## HCM Unsignalized Intersection Capacity Analysis 2: Highway 26 & Garden Centre Access-3rd Line

Future (2028) Background SAT










												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	4	418	16	7	427	0	22	0	10	1	0	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	454	17	8	464	0	24	0	11	1	0	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	464			472			955	951	463	962	960	464
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	464			472			955	951	463	962	960	464
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			90	100	98	100	100	99
cM capacity (veh/h)	1108			1101			236	259	603	231	256	602
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	476	472	35	5								
Volume Left	4	8	24	1								
Volume Right	17	0	11	4								
cSH	1108	1101	292	456								
Volume to Capacity	0.00	0.01	0.12	0.01								
Queue Length 95th (m)	0.1	0.2	3.0	0.3								
Control Delay (s)	0.1	0.2	19.0	13.0								
Lane LOS	A	A	C	B								
Approach Delay (s)	0.1	0.2	19.0	13.0								
Approach LOS			C	B								
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization			38.6%	ICU Level of Service						A		
Analysis Period (min)			15									



# HCM Unsignalized Intersection Capacity Analysis

## 3: Sideroad 7 & 3rd Line

















Future (2028) Background SAT

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	  					
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	9	5	0	7	15	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	5	0	8	16	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	24	16	16			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	24	16	16			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	99	100			
cM capacity (veh/h)	997	1069	1614			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	15	8	16			
Volume Left	10	0	0			
Volume Right	5	0	0			
cSH	1022	1614	1700			
Volume to Capacity	0.01	0.00	0.01			
Queue Length 95th (m)	0.3	0.0	0.0			
Control Delay (s)	8.6	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	8.6	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay	3.3					
Intersection Capacity Utilization	13.3%			ICU Level of Service	A	
Analysis Period (min)	15					

# HCM Unsignalized Intersection Capacity Analysis





## 4: Sideroad 7 & Grey County 7

Future (2028) Background SAT

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	6	1	3	0	1	1	6	90	0	2	78	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	1	3	0	1	1	7	98	0	2	85	10
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	207	205	90	209	210	98	95			98		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	207	205	90	209	210	98	95			98		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	100	100	100	100			100		
cM capacity (veh/h)	750	691	974	746	687	964	1512			1508		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	11	2	104	97								
Volume Left	7	0	7	2								
Volume Right	3	1	0	10								
cSH	798	802	1512	1508								
Volume to Capacity	0.01	0.00	0.00	0.00								
Queue Length 95th (m)	0.3	0.1	0.1	0.0								
Control Delay (s)	9.6	9.5	0.5	0.2								
Lane LOS	A	A	A	A								
Approach Delay (s)	9.6	9.5	0.5	0.2								
Approach LOS	A	A										
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization		20.2%		ICU Level of Service		A						
Analysis Period (min)		15										

# HCM Unsignalized Intersection Capacity Analysis 5: Sideroad 10 & 3rd Line

Future (2028) Background SAT

















						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	0	0	5	11	18	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	5	12	20	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	45	22	24			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	45	22	24			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	968	1061	1604			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	0	17	24			
Volume Left	0	5	0			
Volume Right	0	0	4			
cSH	1700	1604	1700			
Volume to Capacity	0.00	0.00	0.01			
Queue Length 95th (m)	0.0	0.1	0.0			
Control Delay (s)	0.0	2.3	0.0			
Lane LOS	A	A				
Approach Delay (s)	0.0	2.3	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			8.3%	ICU Level of Service	A	
Analysis Period (min)			15			

**APPENDIX G**  
**Future (2017) Total Traffic Conditions**  
**Analysis Outputs**  
Level of Service Calculations

# HCM Signalized Intersection Capacity Analysis













Future (2017) Total AM

## 1: Highway 26-McKibbin Drive & St Vincent Street-County Road 7

												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SBR2
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0		4.0		
Lane Util. Factor		1.00					1.00	1.00		1.00		
Frt		0.88					1.00	0.85		0.99		
Flt Protected		1.00					0.96	1.00		0.98		
Satd. Flow (prot)		1645					1815	1601		1816		
Flt Permitted		0.97					0.76	1.00		0.85		
Satd. Flow (perm)		1597					1434	1601		1589		
Volume (vph)	1	1	9	9	1	74	24	8	45	41	1	8
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	10	10	1	80	26	9	49	45	1	9
RTOR Reduction (vph)	0	9	0	0	0	0	0	4	0	2	0	0
Lane Group Flow (vph)	0	13	0	0	0	0	107	5	0	102	0	0
Turn Type	Perm				Perm		Perm	Perm	Perm	Perm		
Protected Phases	9						2				6	
Permitted Phases	9				2	2		2	6			
Actuated Green, G (s)		2.9					49.4	49.4		49.4		
Effective Green, g (s)		4.9					51.4	51.4		51.4		
Actuated g/C Ratio		0.05					0.57	0.57		0.57		
Clearance Time (s)		6.0					6.0	6.0		6.0		
Vehicle Extension (s)		3.0					3.0	3.0		3.0		
Lane Grp Cap (vph)		87					819	914		907		
v/s Ratio Prot												
v/s Ratio Perm		c0.01					c0.07	0.00		0.06		
v/c Ratio		0.14					0.13	0.01		0.11		
Uniform Delay, d1		40.6					8.9	8.3		8.8		
Progression Factor		1.00					1.00	1.00		1.00		
Incremental Delay, d2		0.8					0.3	0.0		0.3		
Delay (s)		41.3					9.3	8.3		9.1		
Level of Service		D					A	A		A		
Approach Delay (s)		41.3					9.2			9.1		
Approach LOS		D					A			A		
<b>Intersection Summary</b>												
HCM Average Control Delay		29.9					HCM Level of Service			C		
HCM Volume to Capacity ratio		0.30										
Actuated Cycle Length (s)		90.0					Sum of lost time (s)			12.0		
Intersection Capacity Utilization		41.2%					ICU Level of Service			A		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
 1: Highway 26-McKibbin Drive & St Vincent Street-County Road 7




















Future (2017) Total AM

								
Movement	SEL	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations								
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	1.00				1.00	1.00	
Frt	1.00	1.00				1.00	0.99	
Flt Protected	0.95	1.00				0.95	1.00	
Satd. Flow (prot)	1789	1876				1789	1867	
Flt Permitted	0.29	1.00				0.27	1.00	
Satd. Flow (perm)	547	1876				505	1867	
Volume (vph)	4	295	6	2	3	3	275	17
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	321	7	2	3	3	299	18
RTOR Reduction (vph)	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	4	330	0	0	0	6	315	0
Turn Type	Perm					Perm	Perm	
Protected Phases		4					8	
Permitted Phases	4				8	8		
Actuated Green, G (s)	19.7	19.7				19.7	19.7	
Effective Green, g (s)	21.7	21.7				21.7	21.7	
Actuated g/C Ratio	0.24	0.24				0.24	0.24	
Clearance Time (s)	6.0	6.0				6.0	6.0	
Vehicle Extension (s)	3.0	3.0				3.0	3.0	
Lane Grp Cap (vph)	132	452				122	450	
v/s Ratio Prot		c0.18					0.17	
v/s Ratio Perm	0.01					0.01		
v/c Ratio	0.03	0.73				0.05	0.70	
Uniform Delay, d1	26.1	31.5				26.2	31.2	
Progression Factor	1.00	1.00				1.00	1.00	
Incremental Delay, d2	0.1	6.0				0.2	4.7	
Delay (s)	26.2	37.4				26.4	35.9	
Level of Service	C	D				C	D	
Approach Delay (s)		37.3					35.7	
Approach LOS		D					D	
Intersection Summary								

## Queues

Future (2017) Total AM

## 1: Highway 26-McKibbin Drive &amp; St Vincent Street-County Road 7

												
Lane Group	EBL2	EBL	NBL2	NBL	NBT	NBR	SBL	SBT	SEL	SET	NWL2	NWL
Lane Configurations												
Volume (vph)	1	1	1	74	24	8	45	41	4	295	3	3
Lane Group Flow (vph)	0	22	0	0	107	9	0	104	4	330	0	6
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm		Perm	Perm
Protected Phases		9			2			6		4		
Permitted Phases	9		2	2		2	6		4		8	8
Detector Phases	9	9	2	2	2	2	6	6	4	4	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio		0.14			0.12	0.01		0.11	0.02	0.73		0.04
Control Delay		28.2			10.8	7.0		10.3	24.0	40.9		24.5
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay		28.2			10.8	7.0		10.3	24.0	40.9		24.5
Queue Length 50th (m)		2.0			5.9	0.0		5.4	0.5	52.3		0.8
Queue Length 95th (m)		8.8			19.9	2.5		18.5	2.9	76.2		3.6
Internal Link Dist (m)		68.1			4538.6			763.0		331.6		
Turn Bay Length (m)												
Base Capacity (vph)		479			881	981		951	194	542		184
Starvation Cap Reductn		0			0	0		0	0	0		0
Spillback Cap Reductn		0			0	0		0	0	0		0
Storage Cap Reductn		0			0	0		0	0	0		0
Reduced v/c Ratio		0.05			0.12	0.01		0.11	0.02	0.61		0.03

## Intersection Summary

Cycle Length: 90

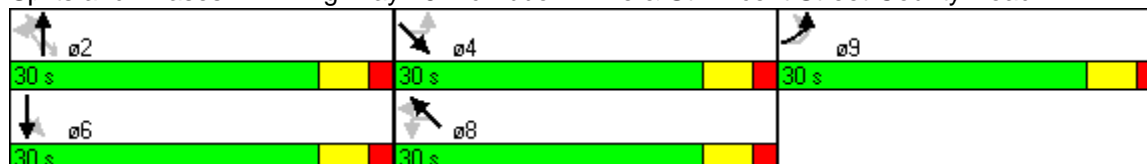
Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Splits and Phases: 1: Highway 26-McKibbin Drive &amp; St Vincent Street-County Road 7



## 1: Highway 26-McKibbin Drive &amp; St Vincent Street-County Road 7



















Lane Group	NWT
Lane Configurations	P
Volume (vph)	275
Lane Group Flow (vph)	317
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	8
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	30.0
Total Split (%)	33.3%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	0.70
Control Delay	39.1
Queue Delay	0.0
Total Delay	39.1
Queue Length 50th (m)	49.4
Queue Length 95th (m)	72.6
Internal Link Dist (m)	393.4
Turn Bay Length (m)	
Base Capacity (vph)	541
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.59
Intersection Summary	





















## HCM Unsignalized Intersection Capacity Analysis 2: Highway 26 & Garden Centre Access-3rd Line

Future (2017) Total AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	285	25	41	224	0	37	0	54	1	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	310	27	45	243	0	40	0	59	1	0	1
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	243			337			659	658	323	717	672	243
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	243			337			659	658	323	717	672	243
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			89	100	92	100	100	100
cM capacity (veh/h)	1323			1222			366	370	718	308	363	795
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	338	288	99	2								
Volume Left	1	45	40	1								
Volume Right	27	0	59	1								
cSH	1323	1222	516	444								
Volume to Capacity	0.00	0.04	0.19	0.00								
Queue Length 95th (m)	0.0	0.9	5.3	0.1								
Control Delay (s)	0.0	1.5	13.6	13.2								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.0	1.5	13.6	13.2								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.5									
Intersection Capacity Utilization			46.9%	ICU Level of Service					A			
Analysis Period (min)			15									










# HCM Unsignalized Intersection Capacity Analysis 2: Highway 26 & Garden Centre Access-3rd Line

Future (2017) Total AM  
Left-Turn Lanes

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Free				Free				Stop		Stop	
Grade	0%				0%				0%		0%	
Volume (veh/h)	1	285	25	41	224	0	37	0	54	1	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	310	27	45	243	0	40	0	59	1	0	1
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	243			337			659	658	323	703	672	243
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	243			337			659	658	323	703	672	243
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			89	100	92	100	100	100
cM capacity (veh/h)	1323			1222			366	370	718	314	363	795
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	1	337	45	243	99	2						
Volume Left	1	0	45	0	40	1						
Volume Right	0	27	0	0	59	1						
cSH	1323	1700	1222	1700	516	450						
Volume to Capacity	0.00	0.20	0.04	0.14	0.19	0.00						
Queue Length 95th (m)	0.0	0.0	0.9	0.0	5.3	0.1						
Control Delay (s)	7.7	0.0	8.1	0.0	13.6	13.0						
Lane LOS	A		A		B	B						
Approach Delay (s)	0.0		1.2		13.6	13.0						
Approach LOS					B	B						
Intersection Summary												
Average Delay			2.4									
Intersection Capacity Utilization			36.1%		ICU Level of Service			A				
Analysis Period (min)			15									

















# HCM Unsignalized Intersection Capacity Analysis 3: Sideroad 7 & 3rd Line

Future (2017) Total AM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	17	0	7	16	12	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	0	8	17	13	21
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	56	23	34			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	56	23	34			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	100	100			
cM capacity (veh/h)	947	1053	1578			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	18	25	34			
Volume Left	18	8	0			
Volume Right	0	0	21			
cSH	947	1578	1700			
Volume to Capacity	0.02	0.00	0.02			
Queue Length 95th (m)	0.5	0.1	0.0			
Control Delay (s)	8.9	2.2	0.0			
Lane LOS	A	A				
Approach Delay (s)	8.9	2.2	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		2.9				
Intersection Capacity Utilization		17.0%		ICU Level of Service		A
Analysis Period (min)		15				

















# HCM Unsignalized Intersection Capacity Analysis 4: Sideroad 7 & County Road 7

Future (2017) Total AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	3	9	10	6	6	9	48	9	5	53	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	3	10	11	7	7	10	52	10	5	58	1
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	155	151	58	157	146	57	59			62		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	155	151	58	157	146	57	59			62		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	99	99	99	99	99			100		
cM capacity (veh/h)	794	734	1008	793	738	1009	1545			1541		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	16	24	72	64								
Volume Left	3	11	10	5								
Volume Right	10	7	10	1								
cSH	893	824	1545	1541								
Volume to Capacity	0.02	0.03	0.01	0.00								
Queue Length 95th (m)	0.4	0.7	0.1	0.1								
Control Delay (s)	9.1	9.5	1.0	0.6								
Lane LOS	A	A	A	A								
Approach Delay (s)	9.1	9.5	1.0	0.6								
Approach LOS	A	A										
Intersection Summary												
Average Delay			2.8									
Intersection Capacity Utilization			15.5%	ICU Level of Service						A		
Analysis Period (min)			15									










# HCM Unsignalized Intersection Capacity Analysis 5: Sideroad 10 & Site Access 1 & 3rd Line

Future (2017) Total AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	7	0	28	5	23	6	20	22	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	8	0	30	5	25	7	22	24	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	139	112	26	109	111	28	28			32		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	139	112	26	109	111	28	28			32		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	99	100	97	100			99		
cM capacity (veh/h)	796	765	1050	859	766	1047	1585			1581		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	0	38	37	50								
Volume Left	0	8	5	22								
Volume Right	0	30	7	4								
cSH	1700	1003	1585	1581								
Volume to Capacity	0.00	0.04	0.00	0.01								
Queue Length 95th (m)	0.0	0.9	0.1	0.3								
Control Delay (s)	0.0	8.7	1.1	3.2								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.0	8.7	1.1	3.2								
Approach LOS	A	A										
Intersection Summary												
Average Delay			4.3									
Intersection Capacity Utilization			15.8%		ICU Level of Service					A		
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis 7: Site Access 2 & 3rd Line

















Future (2017) Total AM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	13	46	37	14	35	32
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	50	40	15	38	35
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	159	48			55	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	159	48			55	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	95			98	
cM capacity (veh/h)	812	1021			1549	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	64	55	73			
Volume Left	14	0	38			
Volume Right	50	15	0			
cSH	966	1700	1549			
Volume to Capacity	0.07	0.03	0.02			
Queue Length 95th (m)	1.6	0.0	0.6			
Control Delay (s)	9.0	0.0	3.9			
Lane LOS	A		A			
Approach Delay (s)	9.0	0.0	3.9			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay		4.5				
Intersection Capacity Utilization		20.5%		ICU Level of Service		A
Analysis Period (min)		15				

# HCM Signalized Intersection Capacity Analysis

Future (2017) Total PM

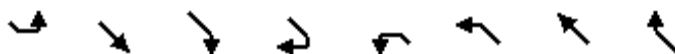
## 1: Highway 26-McKibbin Drive & St Vincent Street-Grey County Road 7

												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SBR2
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0		4.0		
Lane Util. Factor		1.00					1.00	1.00		1.00		
Frt		0.89					1.00	0.85		0.99		
Flt Protected		0.99					0.97	1.00		0.97		
Satd. Flow (prot)		1663					1827	1601		1807		
Flt Permitted		0.92					0.74	1.00		0.72		
Satd. Flow (perm)		1553					1400	1601		1345		
Volume (vph)	1	1	4	4	2	84	53	15	117	42	3	6
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	4	4	2	91	58	16	127	46	3	7
RTOR Reduction (vph)	0	4	0	0	0	0	0	9	0	1	0	0
Lane Group Flow (vph)	0	6	0	0	0	0	151	7	0	182	0	0
Turn Type	Perm				Perm		Perm	Perm		Perm		
Protected Phases	9						2				6	
Permitted Phases	9					2	2	2		6		
Actuated Green, G (s)	1.4						37.9	37.9	37.9			
Effective Green, g (s)	3.4						39.9	39.9	39.9			
Actuated g/C Ratio	0.04						0.44	0.44	0.44			
Clearance Time (s)	6.0						6.0	6.0	6.0			
Vehicle Extension (s)	3.0						3.0	3.0	3.0			
Lane Grp Cap (vph)	59						621	710	596			
v/s Ratio Prot												
v/s Ratio Perm	c0.00						0.11	0.00	c0.14			
v/c Ratio	0.10						0.24	0.01	0.31			
Uniform Delay, d1	41.8						15.6	14.0	16.1			
Progression Factor	1.00						1.00	1.00	1.00			
Incremental Delay, d2	0.8						0.9	0.0	1.3			
Delay (s)	42.6						16.6	14.0	17.4			
Level of Service	D						B	B	B			
Approach Delay (s)	42.6						16.3	17.4				
Approach LOS	D						B	B				
Intersection Summary												
HCM Average Control Delay	28.7				HCM Level of Service				C			
HCM Volume to Capacity ratio	0.55											
Actuated Cycle Length (s)	90.0				Sum of lost time (s)				12.0			
Intersection Capacity Utilization	59.9%				ICU Level of Service				B			
Analysis Period (min)	15											
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

Future (2017) Total PM

## 1: Highway 26-McKibbin Drive & St Vincent Street-Grey County Road 7



Movement	SEL	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations								
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	1.00				1.00	1.00	
Frt	1.00	0.99				1.00	0.99	
Flt Protected	0.95	1.00				0.95	1.00	
Satd. Flow (prot)	1789	1872				1789	1873	
Flt Permitted	0.12	1.00				0.22	1.00	
Satd. Flow (perm)	217	1872				413	1873	
Volume (vph)	8	459	14	6	15	6	558	22
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	499	15	7	16	7	607	24
RTOR Reduction (vph)	0	1	0	0	0	0	2	0
Lane Group Flow (vph)	9	520	0	0	0	23	629	0
Turn Type	Perm					Perm	Perm	
Protected Phases		4					8	
Permitted Phases	4					8	8	
Actuated Green, G (s)	32.7	32.7				32.7	32.7	
Effective Green, g (s)	34.7	34.7				34.7	34.7	
Actuated g/C Ratio	0.39	0.39				0.39	0.39	
Clearance Time (s)	6.0	6.0				6.0	6.0	
Vehicle Extension (s)	3.0	3.0				3.0	3.0	
Lane Grp Cap (vph)	84	722				159	722	
v/s Ratio Prot		0.28					c0.34	
v/s Ratio Perm	0.04					0.06		
v/c Ratio	0.11	0.72				0.14	0.87	
Uniform Delay, d1	17.7	23.5				18.0	25.6	
Progression Factor	1.00	1.00				1.00	1.00	
Incremental Delay, d2	0.6	3.6				0.4	11.2	
Delay (s)	18.3	27.1				18.4	36.8	
Level of Service	B	C				B	D	
Approach Delay (s)		26.9					36.1	
Approach LOS		C					D	




















### Intersection Summary



## Queues

Future (2017) Total PM

## 1: Highway 26-McKibbon Drive &amp; St Vincent Street-Grey County Road 7

												
Lane Group	EBL2	EBL	NBL2	NBL	NBT	NBR	SBL	SBT	SEL	SET	NWL2	NWL
Lane Configurations												
Volume (vph)	1	1	2	84	53	15	117	42	8	459	15	6
Lane Group Flow (vph)	0	10	0	0	151	16	0	183	9	521	0	23
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm		Perm	Perm
Protected Phases		9			2			6		4		
Permitted Phases	9		2	2		2	6		4		8	8
Detector Phases	9	9	2	2	2	2	6	6	4	4	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	22.0	22.0	26.0	26.0	26.0	26.0	26.0	26.0	42.0	42.0	42.0	42.0
Total Split (%)	24.4%	24.4%	28.9%	28.9%	28.9%	28.9%	28.9%	28.9%	46.7%	46.7%	46.7%	46.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio		0.07			0.22	0.02		0.31	0.08	0.72		0.12
Control Delay		31.4			16.6	8.3		18.0	17.9	29.5		18.1
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay		31.4			16.6	8.3		18.0	17.9	29.5		18.1
Queue Length 50th (m)		1.0			14.2	0.0		18.0	0.9	70.2		2.4
Queue Length 95th (m)		5.7			34.3	4.1		43.2	4.0	104.1		7.4
Internal Link Dist (m)		68.1			4538.6			763.0		331.6		
Turn Bay Length (m)												
Base Capacity (vph)		328			697	803		587	124	791		205
Starvation Cap Reductn		0			0	0		0	0	0		0
Spillback Cap Reductn		0			0	0		0	0	0		0
Storage Cap Reductn		0			0	0		0	0	0		0
Reduced v/c Ratio		0.03			0.22	0.02		0.31	0.07	0.66		0.11

## Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

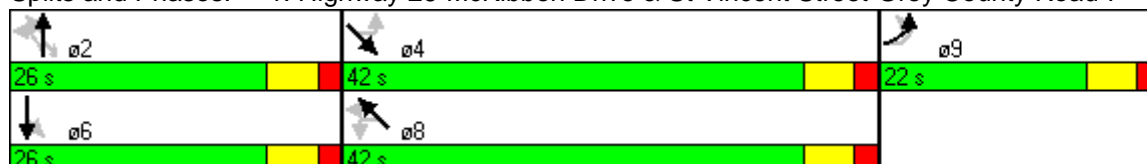
Natural Cycle: 75

Control Type: Actuated-Coordinated

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Highway 26-McKibbon Drive &amp; St Vincent Street-Grey County Road 7



















## 1: Highway 26-McKibbin Drive &amp; St Vincent Street-Grey County Road 7



Lane Group	NWT
Lane Configurations	P
Volume (vph)	558
Lane Group Flow (vph)	631
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	8
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	42.0
Total Split (%)	46.7%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	0.87
Control Delay	39.4
Queue Delay	0.0
Total Delay	39.4
Queue Length 50th (m)	92.5
Queue Length 95th (m)	139.8
Internal Link Dist (m)	393.4
Turn Bay Length (m)	
Base Capacity (vph)	792
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.80
Intersection Summary	




















## HCM Unsignalized Intersection Capacity Analysis 2: Highway 26 & Garden Centre Access-3rd Line

Future (2017) Total PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	350	49	84	416	1	54	0	76	1	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	380	53	91	452	1	59	0	83	1	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	453			434			1045	1045	407	1127	1071	453
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	453			434			1045	1045	407	1127	1071	453
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			92			70	100	87	99	100	100
cM capacity (veh/h)	1107			1126			194	210	644	148	203	607
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	435	545	141	1								
Volume Left	1	91	59	1								
Volume Right	53	1	83	0								
cSH	1107	1126	328	148								
Volume to Capacity	0.00	0.08	0.43	0.01								
Queue Length 95th (m)	0.0	2.0	15.8	0.2								
Control Delay (s)	0.0	2.2	24.0	29.4								
Lane LOS	A	A	C	D								
Approach Delay (s)	0.0	2.2	24.0	29.4								
Approach LOS			C	D								
Intersection Summary												
Average Delay			4.1									
Intersection Capacity Utilization			64.9%		ICU Level of Service				C			
Analysis Period (min)			15									










# HCM Unsignalized Intersection Capacity Analysis 2: Highway 26 & Garden Centre Access-3rd Line

Future (2017) Total PM  
Left-Turn Lanes

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Free			Free				Stop			Stop	
Grade	0%			0%				0%			0%	
Volume (veh/h)	1	350	49	84	416	1	54	0	76	1	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	380	53	91	452	1	59	0	83	1	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None		None			
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	453			434			1044	1045	407	1101	1071	453
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	453			434			1044	1045	407	1101	1071	453
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			92			70	100	87	99	100	100
cM capacity (veh/h)	1107			1126			194	210	644	155	203	607
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	1	434	91	453	141	1						
Volume Left	1	0	91	0	59	1						
Volume Right	0	53	0	1	83	0						
cSH	1107	1700	1126	1700	328	155						
Volume to Capacity	0.00	0.26	0.08	0.27	0.43	0.01						
Queue Length 95th (m)	0.0	0.0	2.0	0.0	15.8	0.2						
Control Delay (s)	8.3	0.0	8.5	0.0	24.0	28.4						
Lane LOS	A		A		C	D						
Approach Delay (s)	0.0		1.4		24.0	28.4						
Approach LOS					C	D						
Intersection Summary												
Average Delay			3.8									
Intersection Capacity Utilization			42.9%		ICU Level of Service		A					
Analysis Period (min)			15									

















# HCM Unsignalized Intersection Capacity Analysis 3: Sideroad 7 & 3rd Line

Future (2017) Total PM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	29	2	0	9	15	26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	2	0	10	16	28
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	40	30	45			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	40	30	45			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	100	100			
cM capacity (veh/h)	971	1044	1564			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	34	10	45			
Volume Left	32	0	0			
Volume Right	2	0	28			
cSH	976	1564	1700			
Volume to Capacity	0.03	0.00	0.03			
Queue Length 95th (m)	0.8	0.0	0.0			
Control Delay (s)	8.8	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	8.8	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		3.4				
Intersection Capacity Utilization		13.3%		ICU Level of Service		A
Analysis Period (min)		15				

















# HCM Unsignalized Intersection Capacity Analysis 4: Sideroad 7 & Grey County 7

Future (2017) Total PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	3	0	12	4	11	3	36	15	10	37	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	3	0	13	4	12	3	39	16	11	40	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	132	126	42	120	120	47	45			55		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	132	126	42	120	120	47	45			55		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	98	99	99	100			99		
cM capacity (veh/h)	821	757	1028	847	763	1022	1564			1549		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	7	29	59	55								
Volume Left	3	13	3	11								
Volume Right	0	12	16	4								
cSH	788	895	1564	1549								
Volume to Capacity	0.01	0.03	0.00	0.01								
Queue Length 95th (m)	0.2	0.8	0.0	0.2								
Control Delay (s)	9.6	9.2	0.4	1.5								
Lane LOS	A	A	A	A								
Approach Delay (s)	9.6	9.2	0.4	1.5								
Approach LOS	A	A										
Intersection Summary												
Average Delay			2.9									
Intersection Capacity Utilization			15.8%	ICU Level of Service				A				
Analysis Period (min)			15									










# HCM Unsignalized Intersection Capacity Analysis 5: Sideroad 10 & Site Access 1 & 3rd Line

Future (2017) Total PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	8	0	29	0	35	10	33	26	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	9	0	32	0	38	11	36	28	2
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	176	150	29	145	146	43	30			49		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	176	150	29	145	146	43	30			49		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	99	100	97	100			98		
cM capacity (veh/h)	749	725	1045	810	729	1027	1582			1558		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	0	40	49	66								
Volume Left	0	9	0	36								
Volume Right	0	32	11	2								
cSH	1700	971	1582	1558								
Volume to Capacity	0.00	0.04	0.00	0.02								
Queue Length 95th (m)	0.0	1.0	0.0	0.5								
Control Delay (s)	0.0	8.9	0.0	4.1								
Lane LOS	A	A		A								
Approach Delay (s)	0.0	8.9	0.0	4.1								
Approach LOS	A	A										
Intersection Summary												
Average Delay			4.0									
Intersection Capacity Utilization	20.0%			ICU Level of Service		A						
Analysis Period (min)	15											

# HCM Unsignalized Intersection Capacity Analysis 6: Site Access 3 & 3rd Line










Future (2017) Total PM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	38	0	0	34
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	41	0	0	37
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	78	41			41	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	78	41			41	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	924	1030			1568	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	41	37			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1568			
Volume to Capacity	0.00	0.02	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay		0.0				
Intersection Capacity Utilization		6.7%		ICU Level of Service	A	
Analysis Period (min)		15				



# HCM Unsignalized Intersection Capacity Analysis 7: Site Access 2 & 3rd Line

Future (2017) Total PM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	21	68	42	22	78	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	74	46	24	85	43
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	271	58			70	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	271	58			70	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	93			94	
cM capacity (veh/h)	679	1009			1531	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	97	70	128			
Volume Left	23	0	85			
Volume Right	74	24	0			
cSH	905	1700	1531			
Volume to Capacity	0.11	0.04	0.06			
Queue Length 95th (m)	2.7	0.0	1.3			
Control Delay (s)	9.5	0.0	5.1			
Lane LOS	A		A			
Approach Delay (s)	9.5	0.0	5.1			
Approach LOS	A					
Intersection Summary						
Average Delay		5.3				
Intersection Capacity Utilization		25.1%		ICU Level of Service		A
Analysis Period (min)		15				

# HCM Signalized Intersection Capacity Analysis

Future (2017) Total SAT

## 1: Highway 12-McKibbin Drive & St Vincent Street-Grey County Road 7






















Movement	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations	PT				PT	PT	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0				4.0	4.0	
Lane Util. Factor	1.00				1.00	1.00	
Frt	0.99				1.00	0.99	
Flt Protected	1.00				0.95	1.00	
Satd. Flow (prot)	1858				1789	1866	
Flt Permitted	1.00				0.21	1.00	
Satd. Flow (perm)	1858				387	1866	
Volume (vph)	329	28	5	1	5	281	18
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	358	30	5	1	5	305	20
RTOR Reduction (vph)	1	0	0	0	0	3	0
Lane Group Flow (vph)	392	0	0	0	6	322	0
Turn Type				Perm	Perm		
Protected Phases	4					8	
Permitted Phases				8	8		
Actuated Green, G (s)	21.7				21.7	21.7	
Effective Green, g (s)	23.7				23.7	23.7	
Actuated g/C Ratio	0.26				0.26	0.26	
Clearance Time (s)	6.0				6.0	6.0	
Vehicle Extension (s)	3.0				3.0	3.0	
Lane Grp Cap (vph)	489				102	491	
v/s Ratio Prot	0.21					0.17	
v/s Ratio Perm					0.02		
v/c Ratio	0.80				0.06	0.66	
Uniform Delay, d1	31.0				24.8	29.5	
Progression Factor	1.00				1.00	1.00	
Incremental Delay, d2	9.2				0.2	3.2	
Delay (s)	40.2				25.0	32.7	
Level of Service	D				C	C	
Approach Delay (s)	40.0					32.5	
Approach LOS	D					C	

### Intersection Summary

## Queues

Future (2017) Total SAT

## 1: Highway 12-McKibbon Drive &amp; St Vincent Street-Grey County Road 7

												
Lane Group	EBL2	EBL	NBL2	NBL	NBT	NBR	SBL	SBT	SEL	SET	NWL2	NWL
Lane Configurations												
Volume (vph)	1	1	2	96	25	8	63	40	4	329	1	5
Lane Group Flow (vph)	0	14	0	0	133	9	0	113	4	393	0	6
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm		Perm	Perm
Protected Phases		9			2			6		4		
Permitted Phases	9		2	2		2	6		4		8	8
Detector Phases	9	9	2	2	2	2	6	6	4	4	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio		0.09			0.16	0.01		0.13	0.02	0.80		0.05
Control Delay		28.5			9.8	6.0		9.5	23.5	44.1		24.5
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay		28.5			9.8	6.0		9.5	23.5	44.1		24.5
Queue Length 50th (m)		1.1			8.7	0.0		7.3	0.5	60.9		0.8
Queue Length 95th (m)		6.6			23.8	2.4		20.4	2.9	#93.2		3.7
Internal Link Dist (m)		68.1			4538.6			763.0		331.6		
Turn Bay Length (m)												
Base Capacity (vph)		477			844	994		898	188	538		134
Starvation Cap Reductn		0			0	0		0	0	0		0
Spillback Cap Reductn		0			0	0		0	0	0		0
Storage Cap Reductn		0			0	0		0	0	0		0
Reduced v/c Ratio		0.03			0.16	0.01		0.13	0.02	0.73		0.04

## Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

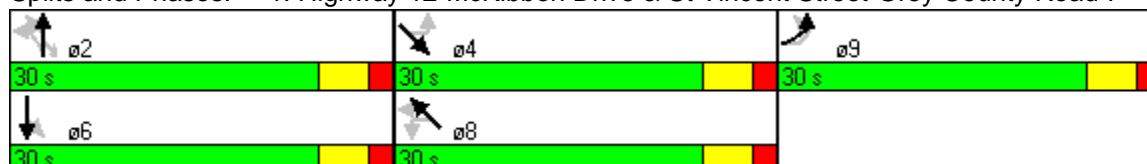
Natural Cycle: 70

Control Type: Actuated-Coordinated

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Highway 12-McKibbon Drive &amp; St Vincent Street-Grey County Road 7



## 1: Highway 12-McKibbin Drive &amp; St Vincent Street-Grey County Road 7




















Lane Group	NWT
Lane Configurations	P
Volume (vph)	281
Lane Group Flow (vph)	325
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	8
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	30.0
Total Split (%)	33.3%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	0.66
Control Delay	35.8
Queue Delay	0.0
Total Delay	35.8
Queue Length 50th (m)	47.5
Queue Length 95th (m)	74.4
Internal Link Dist (m)	393.4
Turn Bay Length (m)	
Base Capacity (vph)	542
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.60
Intersection Summary	

# HCM Signalized Intersection Capacity Analysis

















Future (2017) Total SAT

## 1: Highway 12-McKibbin Drive & St Vincent Street-Grey County Road 7

												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SEL
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0		4.0		4.0
Lane Util. Factor		1.00					1.00	1.00		1.00		1.00
Frt		0.88					1.00	0.85		1.00		1.00
Flt Protected		0.99					0.96	1.00		0.97		0.95
Satd. Flow (prot)		1654					1811	1601		1824		1789
Flt Permitted		0.95					0.73	1.00		0.79		0.31
Satd. Flow (perm)		1579					1376	1601		1493		587
Volume (vph)	1	1	5	6	2	96	25	8	63	40	2	4
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	5	7	2	104	27	9	68	43	2	4
RTOR Reduction (vph)	0	7	0	0	0	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	7	0	0	0	0	133	5	0	113	0	4
Turn Type	Perm				Perm	Perm		Perm	Perm			Perm
Protected Phases		9					2			6		
Permitted Phases	9				2	2		2	6			4
Actuated Green, G (s)		1.4					48.9	48.9		48.9		21.7
Effective Green, g (s)		3.4					50.9	50.9		50.9		23.7
Actuated g/C Ratio		0.04					0.57	0.57		0.57		0.26
Clearance Time (s)		6.0					6.0	6.0		6.0		6.0
Vehicle Extension (s)		3.0					3.0	3.0		3.0		3.0
Lane Grp Cap (vph)		60					778	905		844		155
v/s Ratio Prot												
v/s Ratio Perm		c0.00					c0.10	0.00		0.08		0.01
v/c Ratio		0.12					0.17	0.01		0.13		0.03
Uniform Delay, d1		41.9					9.4	8.5		9.2		24.6
Progression Factor		1.00					1.00	1.00		1.00		1.00
Incremental Delay, d2		0.9					0.5	0.0		0.3		0.1
Delay (s)		42.8					9.9	8.5		9.5		24.7
Level of Service		D					A	A		A		C
Approach Delay (s)		42.8					9.8			9.5		
Approach LOS		D					A			A		
<b>Intersection Summary</b>												
HCM Average Control Delay		29.8					HCM Level of Service			C		
HCM Volume to Capacity ratio		0.36										
Actuated Cycle Length (s)		90.0					Sum of lost time (s)			12.0		
Intersection Capacity Utilization		45.0%					ICU Level of Service			A		
Analysis Period (min)		15										
c Critical Lane Group												




















## HCM Unsignalized Intersection Capacity Analysis 2: Highway 26 & Garden Centre Access-3rd Line

Future (2017) Total SAT

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	4	336	75	74	343	0	57	0	104	1	0	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	365	82	80	373	0	62	0	113	1	0	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	373			447			953	948	406	1061	989	373
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	373			447			953	948	406	1061	989	373
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			93			72	100	82	99	100	99
cM capacity (veh/h)	1186			1114			224	241	645	157	228	673
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	451	453	175	5								
Volume Left	4	80	62	1								
Volume Right	82	0	113	4								
cSH	1186	1114	387	406								
Volume to Capacity	0.00	0.07	0.45	0.01								
Queue Length 95th (m)	0.1	1.8	17.3	0.3								
Control Delay (s)	0.1	2.2	21.8	14.0								
Lane LOS	A	A	C	B								
Approach Delay (s)	0.1	2.2	21.8	14.0								
Approach LOS			C	B								
Intersection Summary												
Average Delay			4.5									
Intersection Capacity Utilization			70.8%	ICU Level of Service					C			
Analysis Period (min)			15									










# HCM Unsignalized Intersection Capacity Analysis 2: Highway 26 & Garden Centre Access-3rd Line

Future (2017) Total SAT  
Left-Turn Lanes

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Free			Free				Stop			Stop	
Grade	0%			0%				0%			0%	
Volume (veh/h)	4	336	74	70	343	0	57	0	104	1	0	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	365	80	76	373	0	62	0	113	1	0	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	373			446			943	939	405	1012	979	373
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	373			446			943	939	405	1012	979	373
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			93			73	100	82	99	100	99
cM capacity (veh/h)	1186			1115			228	245	645	170	232	673
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	4	446	76	373	175	5						
Volume Left	4	0	76	0	62	1						
Volume Right	0	80	0	0	113	4						
cSH	1186	1700	1115	1700	391	423						
Volume to Capacity	0.00	0.26	0.07	0.22	0.45	0.01						
Queue Length 95th (m)	0.1	0.0	1.7	0.0	17.0	0.3						
Control Delay (s)	8.0	0.0	8.5	0.0	21.4	13.6						
Lane LOS	A		A		C	B						
Approach Delay (s)	0.1		1.4		21.4	13.6						
Approach LOS					C	B						
Intersection Summary												
Average Delay			4.2									
Intersection Capacity Utilization			52.3%		ICU Level of Service		A					
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis 3: Sideroad 7 & 3rd Line

















Future (2017) Total SAT

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	48	5	0	12	22	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	52	5	0	13	24	41
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	58	45	65			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	58	45	65			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	99	100			
cM capacity (veh/h)	950	1025	1537			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	58	13	65			
Volume Left	52	0	0			
Volume Right	5	0	41			
cSH	956	1537	1700			
Volume to Capacity	0.06	0.00	0.04			
Queue Length 95th (m)	1.5	0.0	0.0			
Control Delay (s)	9.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	9.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		3.8				
Intersection Capacity Utilization		13.5%	ICU Level of Service	A		
Analysis Period (min)		15				



















# HCM Unsignalized Intersection Capacity Analysis 4: Sideroad 7 & Grey County 7

Future (2017) Total SAT

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	6	7	3	22	6	12	6	73	14	21	63	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	8	3	24	7	13	7	79	15	23	68	10
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	235	227	73	226	224	87	78			95		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	235	227	73	226	224	87	78			95		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	100	97	99	99	100			98		
cM capacity (veh/h)	694	660	988	710	662	972	1520			1499		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	17	43	101	101								
Volume Left	7	24	7	23								
Volume Right	3	13	15	10								
cSH	718	763	1520	1499								
Volume to Capacity	0.02	0.06	0.00	0.02								
Queue Length 95th (m)	0.6	1.4	0.1	0.4								
Control Delay (s)	10.1	10.0	0.5	1.8								
Lane LOS	B	B	A	A								
Approach Delay (s)	10.1	10.0	0.5	1.8								
Approach LOS	B	B										
Intersection Summary												
Average Delay			3.2									
Intersection Capacity Utilization	21.2%		ICU Level of Service					A				
Analysis Period (min)	15											










# HCM Unsignalized Intersection Capacity Analysis 5: Sideroad 10 & Site Access 1 & 3rd Line

Future (2017) Total SAT

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	15	0	42	5	40	15	45	51	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	16	0	46	5	43	16	49	55	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	264	226	58	218	220	52	60			60		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	264	226	58	218	220	52	60			60		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	98	100	96	100			97		
cM capacity (veh/h)	641	650	1009	719	654	1016	1544			1544		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	0	62	65	109								
Volume Left	0	16	5	49								
Volume Right	0	46	16	4								
cSH	1700	916	1544	1544								
Volume to Capacity	0.00	0.07	0.00	0.03								
Queue Length 95th (m)	0.0	1.7	0.1	0.7								
Control Delay (s)	0.0	9.2	0.6	3.5								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.0	9.2	0.6	3.5								
Approach LOS	A	A										
Intersection Summary												
Average Delay			4.2									
Intersection Capacity Utilization		22.2%		ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
7: Site Access 2 & 3rd Line

Future (2017) Total SAT

















						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	33	87	53	29	81	67
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	36	95	58	32	88	73
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	322	73			89	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	322	73			89	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	90			94	
cM capacity (veh/h)	632	988			1506	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	130	89	161			
Volume Left	36	0	88			
Volume Right	95	32	0			
cSH	856	1700	1506			
Volume to Capacity	0.15	0.05	0.06			
Queue Length 95th (m)	4.1	0.0	1.4			
Control Delay (s)	10.0	0.0	4.3			
Lane LOS	A		A			
Approach Delay (s)	10.0	0.0	4.3			
Approach LOS	A					
Intersection Summary						
Average Delay		5.2				
Intersection Capacity Utilization		28.5%		ICU Level of Service		A
Analysis Period (min)		15				

**APPENDIX H**  
**Future (2022) Total Traffic Conditions**  
**Analysis Outputs**  
Level of Service Calculations

# HCM Signalized Intersection Capacity Analysis













Future (2022) Total AM

## 1: Highway 26-McKibbin Drive & St Vincent Street-County Road 7

												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SBR2
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0		4.0		
Lane Util. Factor		1.00					1.00	1.00		1.00		
Frt		0.88					1.00	0.85		0.99		
Flt Protected		1.00					0.96	1.00		0.98		
Satd. Flow (prot)		1645					1816	1601		1819		
Flt Permitted		0.97					0.76	1.00		0.85		
Satd. Flow (perm)		1597					1427	1601		1582		
Volume (vph)	1	1	9	9	1	77	28	8	48	46	1	8
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	10	10	1	84	30	9	52	50	1	9
RTOR Reduction (vph)	0	9	0	0	0	0	0	4	0	2	0	0
Lane Group Flow (vph)	0	13	0	0	0	0	115	5	0	110	0	0
Turn Type	Perm				Perm	Perm		Perm	Perm			
Protected Phases		9					2			6		
Permitted Phases	9				2	2		2	6			
Actuated Green, G (s)		2.9					48.1	48.1		48.1		
Effective Green, g (s)		4.9					50.1	50.1		50.1		
Actuated g/C Ratio		0.05					0.56	0.56		0.56		
Clearance Time (s)		6.0					6.0	6.0		6.0		
Vehicle Extension (s)		3.0					3.0	3.0		3.0		
Lane Grp Cap (vph)		87					794	891		881		
v/s Ratio Prot												
v/s Ratio Perm		c0.01					c0.08	0.00		0.07		
v/c Ratio		0.14					0.14	0.01		0.12		
Uniform Delay, d1		40.6					9.6	8.9		9.5		
Progression Factor		1.00					1.00	1.00		1.00		
Incremental Delay, d2		0.8					0.4	0.0		0.3		
Delay (s)		41.3					10.0	8.9		9.8		
Level of Service		D					B	A		A		
Approach Delay (s)		41.3					9.9			9.8		
Approach LOS		D					A			A		
<b>Intersection Summary</b>												
HCM Average Control Delay		31.6					HCM Level of Service			C		
HCM Volume to Capacity ratio		0.33										
Actuated Cycle Length (s)		90.0					Sum of lost time (s)			12.0		
Intersection Capacity Utilization		43.8%					ICU Level of Service			A		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
 1: Highway 26-McKibbin Drive & St Vincent Street-County Road 7




















Future (2022) Total AM

								
Movement	SEL	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations								
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	1.00				1.00	1.00	
Frt	1.00	1.00				1.00	0.99	
Flt Protected	0.95	1.00				0.95	1.00	
Satd. Flow (prot)	1789	1874				1789	1867	
Flt Permitted	0.24	1.00				0.22	1.00	
Satd. Flow (perm)	449	1874				419	1867	
Volume (vph)	4	332	9	2	3	3	315	19
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	361	10	2	3	3	342	21
RTOR Reduction (vph)	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	4	373	0	0	0	6	361	0
Turn Type	Perm					Perm	Perm	
Protected Phases		4					8	
Permitted Phases	4				8	8		
Actuated Green, G (s)	21.0	21.0				21.0	21.0	
Effective Green, g (s)	23.0	23.0				23.0	23.0	
Actuated g/C Ratio	0.26	0.26				0.26	0.26	
Clearance Time (s)	6.0	6.0				6.0	6.0	
Vehicle Extension (s)	3.0	3.0				3.0	3.0	
Lane Grp Cap (vph)	115	479				107	477	
v/s Ratio Prot		c0.20					0.19	
v/s Ratio Perm	0.01					0.01		
v/c Ratio	0.03	0.78				0.06	0.76	
Uniform Delay, d1	25.2	31.1				25.3	30.9	
Progression Factor	1.00	1.00				1.00	1.00	
Incremental Delay, d2	0.1	7.8				0.2	6.7	
Delay (s)	25.3	39.0				25.5	37.6	
Level of Service	C	D				C	D	
Approach Delay (s)		38.8					37.4	
Approach LOS		D					D	
Intersection Summary								

## Queues

Future (2022) Total AM

## 1: Highway 26-McKibbin Drive &amp; St Vincent Street-County Road 7

												
Lane Group	EBL2	EBL	NBL2	NBL	NBT	NBR	SBL	SBT	SEL	SET	NWL2	NWL
Lane Configurations												
Volume (vph)	1	1	1	77	28	8	48	46	4	332	3	3
Lane Group Flow (vph)	0	22	0	0	115	9	0	112	4	373	0	6
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm		Perm	Perm
Protected Phases		9			2			6		4		
Permitted Phases	9		2	2		2	6		4		8	8
Detector Phases	9	9	2	2	2	2	6	6	4	4	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio		0.14			0.13	0.01		0.12	0.03	0.78		0.05
Control Delay		28.2			11.3	7.1		10.7	24.0	42.8		24.5
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay		28.2			11.3	7.1		10.7	24.0	42.8		24.5
Queue Length 50th (m)		2.0			7.0	0.0		6.4	0.5	58.5		0.8
Queue Length 95th (m)		8.8			21.1	2.5		19.7	2.9	87.4		3.6
Internal Link Dist (m)		68.1			4538.6			763.0		331.6		
Turn Bay Length (m)												
Base Capacity (vph)		479			853	958		925	158	541		150
Starvation Cap Reductn		0			0	0		0	0	0		0
Spillback Cap Reductn		0			0	0		0	0	0		0
Storage Cap Reductn		0			0	0		0	0	0		0
Reduced v/c Ratio		0.05			0.13	0.01		0.12	0.03	0.69		0.04

## Intersection Summary

Cycle Length: 90

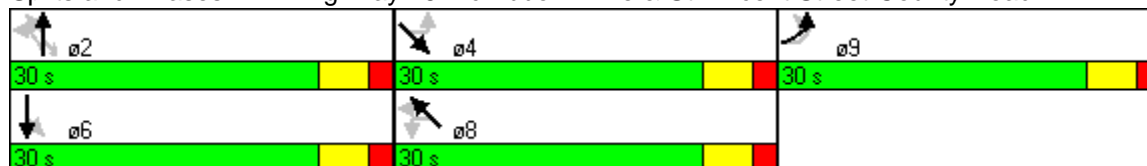
Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Splits and Phases: 1: Highway 26-McKibbin Drive &amp; St Vincent Street-County Road 7



## 1: Highway 26-McKibbin Drive &amp; St Vincent Street-County Road 7

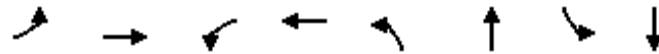


Lane Group	NWT
Lane Configurations	P
Volume (vph)	315
Lane Group Flow (vph)	363
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	8
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	30.0
Total Split (%)	33.3%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	0.76
Control Delay	41.2
Queue Delay	0.0
Total Delay	41.2
Queue Length 50th (m)	56.1
Queue Length 95th (m)	84.3
Internal Link Dist (m)	393.4
Turn Bay Length (m)	
Base Capacity (vph)	541
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.67
Intersection Summary	



Queues  
2: Highway 26 & Garden Centre Access-3rd Line

Future (2017) Total AM  
Signalized



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	1	316	65	249	51	0	1	0
Lane Group Flow (vph)	1	381	71	271	55	97	0	2
Turn Type	Perm		pm+pt		Perm		Perm	
Protected Phases		4	3	8		2		6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	3	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	10.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	42.0	42.0	20.0	62.0	28.0	28.0	28.0	28.0
Total Split (%)	46.7%	46.7%	22.2%	68.9%	31.1%	31.1%	31.1%	31.1%
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
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Max	Max	Max	Max
v/c Ratio	0.00	0.64	0.17	0.33	0.09	0.10		0.00
Control Delay	15.0	23.2	9.5	10.8	16.1	0.2		14.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	15.0	23.2	9.5	10.8	16.1	0.2		14.5
Queue Length 50th (m)	0.1	38.4	4.1	17.4	4.2	0.0		0.1
Queue Length 95th (m)	1.0	64.3	9.0	28.9	13.1	0.0		1.5
Internal Link Dist (m)		82.1		668.4		114.4		99.1
Turn Bay Length (m)	15.0		30.0					
Base Capacity (vph)	548	914	519	1213	606	1014		697
Starvation Cap Reductn	0	0	0	0	0	0		0
Spillback Cap Reductn	0	0	0	0	0	0		0
Storage Cap Reductn	0	0	0	0	0	0		0
Reduced v/c Ratio	0.00	0.42	0.14	0.22	0.09	0.10		0.00

Intersection Summary

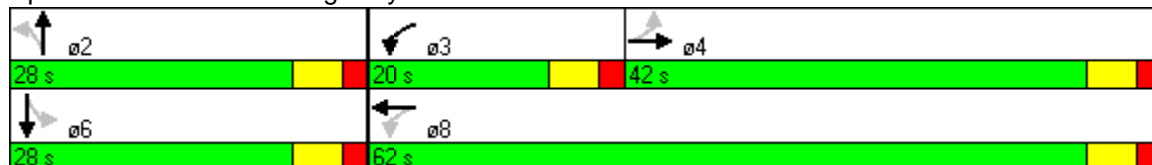
Cycle Length: 90

Actuated Cycle Length: 59.4

Natural Cycle: 55

Control Type: Semi Act-Uncoord





















Splits and Phases: 2: Highway 26 & Garden Centre Access-3rd Line



# HCM Signalized Intersection Capacity Analysis



















## 2: Highway 26 & Garden Centre Access-3rd Line

Future (2017) Total AM  
Signalized

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.85			0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	
Satd. Flow (prot)	1789	1855		1789	1883		1789	1601			1713	
Flt Permitted	0.59	1.00		0.26	1.00		0.76	1.00			0.94	
Satd. Flow (perm)	1116	1855		496	1883		1425	1601			1648	
Volume (vph)	1	316	35	65	249	0	51	0	89	1	0	1
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	343	38	71	271	0	55	0	97	1	0	1
RTOR Reduction (vph)	0	6	0	0	0	0	0	57	0	0	1	0
Lane Group Flow (vph)	1	375	0	71	271	0	55	40	0	0	1	0
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.7	16.7		26.5	26.5		23.2	23.2			23.2	
Effective Green, g (s)	18.7	18.7		28.5	28.5		25.2	25.2			25.2	
Actuated g/C Ratio	0.30	0.30		0.46	0.46		0.41	0.41			0.41	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	338	562		351	870		582	654			673	
v/s Ratio Prot		c0.20		0.02	c0.14			0.02				
v/s Ratio Perm	0.00			0.07			c0.04				0.00	
v/c Ratio	0.00	0.67		0.20	0.31		0.09	0.06			0.00	
Uniform Delay, d1	15.0	18.8		10.5	10.4		11.2	11.1			10.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	3.0		0.3	0.2		0.3	0.2			0.0	
Delay (s)	15.0	21.8		10.7	10.6		11.6	11.2			10.8	
Level of Service	B	C		B	B		B	B			B	
Approach Delay (s)		21.8			10.7			11.4			10.8	
Approach LOS		C			B			B			B	
<b>Intersection Summary</b>												
HCM Average Control Delay			15.6			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.34									
Actuated Cycle Length (s)			61.7			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			37.9%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												










## HCM Unsignalized Intersection Capacity Analysis 2: Highway 26 & Garden Centre Access-3rd Line

Future (2022) Total AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Free			Free				Stop			Stop	
Grade	0%			0%				0%			0%	
Volume (veh/h)	1	316	35	65	249	0	51	0	89	1	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	343	38	71	271	0	55	0	97	1	0	1
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None						None					
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	271			382			778	777	362	854	796	271
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	271			382			778	777	362	854	796	271
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			94			81	100	86	100	100	100
cM capacity (veh/h)	1293			1177			299	308	682	228	301	768
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	1	382	71	271	152	2						
Volume Left	1	0	71	0	55	1						
Volume Right	0	38	0	0	97	1						
cSH	1293	1700	1177	1700	465	352						
Volume to Capacity	0.00	0.22	0.06	0.16	0.33	0.01						
Queue Length 95th (m)	0.0	0.0	1.5	0.0	10.7	0.1						
Control Delay (s)	7.8	0.0	8.3	0.0	16.5	15.3						
Lane LOS	A		A		C	C						
Approach Delay (s)	0.0		1.7		16.5	15.3						
Approach LOS					C	C						
Intersection Summary												
Average Delay			3.6									
Intersection Capacity Utilization			41.8%		ICU Level of Service				A			
Analysis Period (min)			15									

















# HCM Unsignalized Intersection Capacity Analysis 3: Sideroad 7 & 3rd Line

Future (2022) Total AM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	29	0	7	19	13	34
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	0	8	21	14	37
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	68	33	51			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	68	33	51			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	100	100			
cM capacity (veh/h)	932	1041	1555			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	32	28	51			
Volume Left	32	8	0			
Volume Right	0	0	37			
cSH	932	1555	1700			
Volume to Capacity	0.03	0.00	0.03			
Queue Length 95th (m)	0.8	0.1	0.0			
Control Delay (s)	9.0	2.0	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.0	2.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		3.1				
Intersection Capacity Utilization		17.1%		ICU Level of Service		A
Analysis Period (min)		15				

















# HCM Unsignalized Intersection Capacity Analysis 4: Sideroad 7 & County Road 7

Future (2022) Total AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	4	9	20	7	10	9	54	16	9	59	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	4	10	22	8	11	10	59	17	10	64	1
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	186	180	65	183	172	67	65			76		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	186	180	65	183	172	67	65			76		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	99	97	99	99	99			99		
cM capacity (veh/h)	753	705	999	759	712	996	1537			1523		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	17	40	86	75								
Volume Left	3	22	10	10								
Volume Right	10	11	17	1								
cSH	857	801	1537	1523								
Volume to Capacity	0.02	0.05	0.01	0.01								
Queue Length 95th (m)	0.5	1.2	0.1	0.1								
Control Delay (s)	9.3	9.7	0.9	1.0								
Lane LOS	A	A	A	A								
Approach Delay (s)	9.3	9.7	0.9	1.0								
Approach LOS	A	A										
Intersection Summary												
Average Delay			3.2									
Intersection Capacity Utilization			17.2%		ICU Level of Service					A		
Analysis Period (min)			15									










# HCM Unsignalized Intersection Capacity Analysis 5: Sideroad 10 & Site Access 2 & 3rd Line

Future (2022) Total AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	18	0	65	5	23	21	46	27	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	20	0	71	5	25	23	50	29	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	249	190	32	179	181	36	34			48		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	249	190	32	179	181	36	34			48		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	97	100	93	100			97		
cM capacity (veh/h)	638	680	1042	762	688	1036	1578			1559		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	0	90	53	84								
Volume Left	0	20	5	50								
Volume Right	0	71	23	4								
cSH	1700	961	1578	1559								
Volume to Capacity	0.00	0.09	0.00	0.03								
Queue Length 95th (m)	0.0	2.4	0.1	0.8								
Control Delay (s)	0.0	9.1	0.8	4.5								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.0	9.1	0.8	4.5								
Approach LOS	A	A										
Intersection Summary												
Average Delay			5.5									
Intersection Capacity Utilization		22.5%		ICU Level of Service		A						
Analysis Period (min)		15										










# HCM Unsignalized Intersection Capacity Analysis 6: Site Access 2 & 3rd Line

Future (2022) Total AM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	48	0	0	45
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	52	0	0	49
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	101	52			52	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	101	52			52	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	897	1015			1554	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	52	49			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1554			
Volume to Capacity	0.00	0.03	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		0.0				
Intersection Capacity Utilization		6.7%		ICU Level of Service		A
Analysis Period (min)		15				

# HCM Unsignalized Intersection Capacity Analysis 7: Site Access 2 & 3rd Line

Future (2022) Total AM

















						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	18	58	74	14	43	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	63	80	15	47	63
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	245	88			96	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	245	88			96	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	94			97	
cM capacity (veh/h)	721	970			1498	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	83	96	110			
Volume Left	20	0	47			
Volume Right	63	15	0			
cSH	897	1700	1498			
Volume to Capacity	0.09	0.06	0.03			
Queue Length 95th (m)	2.3	0.0	0.7			
Control Delay (s)	9.4	0.0	3.3			
Lane LOS	A		A			
Approach Delay (s)	9.4	0.0	3.3			
Approach LOS	A					
Intersection Summary						
Average Delay		4.0				
Intersection Capacity Utilization		23.3%		ICU Level of Service		A
Analysis Period (min)		15				



# HCM Signalized Intersection Capacity Analysis

Future (2022) Total PM

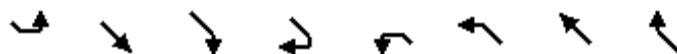
## 1: Highway 26-McKibbin Drive & St Vincent Street-Grey County Road 7

												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SBR2
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0		4.0		
Lane Util. Factor		1.00					1.00	1.00		1.00		
Frt		0.89					1.00	0.85		0.99		
Flt Protected		0.99					0.97	1.00		0.97		
Satd. Flow (prot)		1663					1828	1601		1809		
Flt Permitted		0.92					0.75	1.00		0.71		
Satd. Flow (perm)		1553					1415	1601		1331		
Volume (vph)	1	1	4	4	2	88	59	15	123	48	3	6
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	4	4	2	96	64	16	134	52	3	7
RTOR Reduction (vph)	0	4	0	0	0	0	0	9	0	1	0	0
Lane Group Flow (vph)	0	6	0	0	0	0	162	7	0	195	0	0
Turn Type	Perm				Perm		Perm	Perm		Perm		
Protected Phases	9						2				6	
Permitted Phases	9					2	2	2		6		
Actuated Green, G (s)	1.4						35.8	35.8		35.8		
Effective Green, g (s)	3.4						37.8	37.8		37.8		
Actuated g/C Ratio	0.04						0.42	0.42		0.42		
Clearance Time (s)	6.0						6.0	6.0		6.0		
Vehicle Extension (s)	3.0						3.0	3.0		3.0		
Lane Grp Cap (vph)	59						594	672		559		
v/s Ratio Prot												
v/s Ratio Perm	c0.00						0.11	0.00		c0.15		
v/c Ratio	0.10						0.27	0.01		0.35		
Uniform Delay, d1	41.8						17.1	15.2		17.7		
Progression Factor	1.00						1.00	1.00		1.00		
Incremental Delay, d2	0.8						1.1	0.0		1.7		
Delay (s)	42.6						18.2	15.2		19.4		
Level of Service	D						B	B		B		
Approach Delay (s)	42.6						18.0			19.4		
Approach LOS	D						B			B		
Intersection Summary												
HCM Average Control Delay	31.7				HCM Level of Service				C			
HCM Volume to Capacity ratio	0.61											
Actuated Cycle Length (s)	90.0				Sum of lost time (s)				12.0			
Intersection Capacity Utilization	64.6%				ICU Level of Service				C			
Analysis Period (min)	15											
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

Future (2022) Total PM

## 1: Highway 26-McKibbin Drive & St Vincent Street-Grey County Road 7






















Movement	SEL	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations								
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	1.00				1.00	1.00	
Frt	1.00	0.99				1.00	0.99	
Flt Protected	0.95	1.00				0.95	1.00	
Satd. Flow (prot)	1789	1871				1789	1873	
Flt Permitted	0.11	1.00				0.18	1.00	
Satd. Flow (perm)	205	1871				338	1873	
Volume (vph)	8	519	17	6	15	6	630	25
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	564	18	7	16	7	685	27
RTOR Reduction (vph)	0	1	0	0	0	0	2	0
Lane Group Flow (vph)	9	588	0	0	0	23	710	0
Turn Type	Perm				Perm	Perm		
Protected Phases		4					8	
Permitted Phases	4				8	8		
Actuated Green, G (s)	34.8	34.8				34.8	34.8	
Effective Green, g (s)	36.8	36.8				36.8	36.8	
Actuated g/C Ratio	0.41	0.41				0.41	0.41	
Clearance Time (s)	6.0	6.0				6.0	6.0	
Vehicle Extension (s)	3.0	3.0				3.0	3.0	
Lane Grp Cap (vph)	84	765				138	766	
v/s Ratio Prot		0.31					c0.38	
v/s Ratio Perm	0.04					0.07		
v/c Ratio	0.11	0.77				0.17	0.93	
Uniform Delay, d1	16.4	22.9				16.9	25.3	
Progression Factor	1.00	1.00				1.00	1.00	
Incremental Delay, d2	0.6	4.7				0.6	17.1	
Delay (s)	17.0	27.6				17.4	42.5	
Level of Service	B	C				B	D	
Approach Delay (s)		27.5					41.7	
Approach LOS		C					D	

### Intersection Summary

## Queues

Future (2022) Total PM

## 1: Highway 26-McKibbon Drive &amp; St Vincent Street-Grey County Road 7

												
Lane Group	EBL2	EBL	NBL2	NBL	NBT	NBR	SBL	SBT	SEL	SET	NWL2	NWL
Lane Configurations												
Volume (vph)	1	1	2	88	59	15	123	48	8	519	15	6
Lane Group Flow (vph)	0	10	0	0	162	16	0	196	9	589	0	23
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm		Perm	Perm
Protected Phases		9			2			6		4		
Permitted Phases	9		2	2		2	6		4		8	8
Detector Phases	9	9	2	2	2	2	6	6	4	4	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	22.0	22.0	26.0	26.0	26.0	26.0	26.0	26.0	42.0	42.0	42.0	42.0
Total Split (%)	24.4%	24.4%	28.9%	28.9%	28.9%	28.9%	28.9%	28.9%	46.7%	46.7%	46.7%	46.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio		0.07			0.25	0.02		0.36	0.11	0.77		0.15
Control Delay		31.4			17.4	8.3		19.5	20.0	30.5		19.4
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay		31.4			17.4	8.3		19.5	20.0	30.5		19.4
Queue Length 50th (m)		1.0			15.5	0.0		19.8	0.9	83.4		2.4
Queue Length 95th (m)		5.7			36.7	4.1		46.9	4.3	123.2		7.8
Internal Link Dist (m)		68.1			4538.6			763.0		331.6		
Turn Bay Length (m)												
Base Capacity (vph)		328			660	766		543	84	791		154
Starvation Cap Reductn		0			0	0		0	0	0		0
Spillback Cap Reductn		0			0	0		0	0	0		0
Storage Cap Reductn		0			0	0		0	0	0		0
Reduced v/c Ratio		0.03			0.25	0.02		0.36	0.11	0.74		0.15

## Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green














Natural Cycle: 80

Control Type: Actuated-Coordinated

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Highway 26-McKibbon Drive &amp; St Vincent Street-Grey County Road 7

						
26 s	42 s	22 s				
						
26 s	42 s					

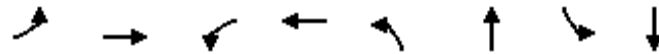
## 1: Highway 26-McKibbin Drive &amp; St Vincent Street-Grey County Road 7



Lane Group	NWT
Lane Configurations	P
Volume (vph)	630
Lane Group Flow (vph)	712
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	8
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	42.0
Total Split (%)	46.7%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	0.93
Control Delay	45.2
Queue Delay	0.0
Total Delay	45.2
Queue Length 50th (m)	111.1
Queue Length 95th (m)	180.3
Internal Link Dist (m)	393.4
Turn Bay Length (m)	
Base Capacity (vph)	792
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.90
Intersection Summary	

Queues  
2: Highway 26 & Garden Centre Access-3rd Line

Future (2022) Total PM  
Signalized



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	1	388	133	461	70	0	1	0
Lane Group Flow (vph)	1	495	145	502	76	129	0	1
Turn Type	Perm		pm+pt		Perm		Perm	
Protected Phases		4	3	8		2		6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	3	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	10.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	45.0	45.0	19.0	64.0	26.0	26.0	26.0	26.0
Total Split (%)	50.0%	50.0%	21.1%	71.1%	28.9%	28.9%	28.9%	28.9%
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
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Max	Max	Max	Max
v/c Ratio	0.00	0.73	0.32	0.51	0.15	0.14		0.00
Control Delay	13.0	25.0	8.8	10.9	21.5	0.3		21.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	13.0	25.0	8.8	10.9	21.5	0.3		21.0
Queue Length 50th (m)	0.1	52.8	8.0	34.7	6.9	0.0		0.1
Queue Length 95th (m)	1.0	85.9	14.7	52.6	20.2	0.0		1.3
Internal Link Dist (m)		82.1		668.4		114.4		99.1
Turn Bay Length (m)	15.0		30.0					
Base Capacity (vph)	450	925	519	1255	496	896		417
Starvation Cap Reductn	0	0	0	0	0	0		0
Spillback Cap Reductn	0	0	0	0	0	0		0
Storage Cap Reductn	0	0	0	0	0	0		0
Reduced v/c Ratio	0.00	0.54	0.28	0.40	0.15	0.14		0.00

Intersection Summary

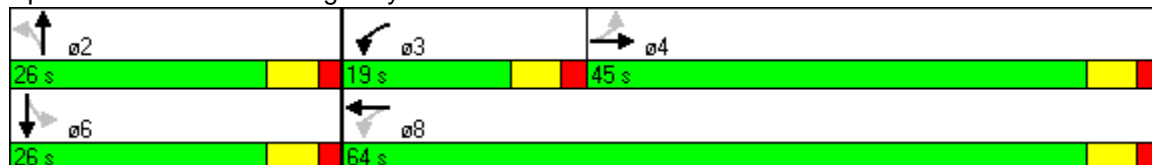
Cycle Length: 90

Actuated Cycle Length: 66.7

Natural Cycle: 60




















Control Type: Semi Act-Uncoord

Splits and Phases: 2: Highway 26 & Garden Centre Access-3rd Line





















HCM Signalized Intersection Capacity Analysis  
2: Highway 26 & Garden Centre Access-3rd Line

Future (2022) Total PM  
Signalized

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.85			1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.95	
Satd. Flow (prot)	1789	1842		1789	1883		1789	1601			1789	
Flt Permitted	0.48	1.00		0.20	1.00		0.76	1.00			0.67	
Satd. Flow (perm)	903	1842		378	1883		1426	1601			1270	
Volume (vph)	1	388	67	133	461	1	70	0	119	1	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	422	73	145	501	1	76	0	129	1	0	0
RTOR Reduction (vph)	0	8	0	0	0	0	0	85	0	0	0	0
Lane Group Flow (vph)	1	487	0	145	502	0	76	44	0	0	1	0
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	22.2	22.2		34.5	34.5		21.1	21.1			21.1	
Effective Green, g (s)	24.2	24.2		36.5	36.5		23.1	23.1			23.1	
Actuated g/C Ratio	0.36	0.36		0.54	0.54		0.34	0.34			0.34	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	323	659		377	1017		487	547			434	
v/s Ratio Prot		c0.26		0.05	c0.27			0.03				
v/s Ratio Perm	0.00			0.16			c0.05				0.00	
v/c Ratio	0.00	0.74		0.38	0.49		0.16	0.08			0.00	
Uniform Delay, d1	13.9	18.9		10.2	9.8		15.5	15.1			14.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	4.3		0.7	0.4		0.7	0.3			0.0	
Delay (s)	14.0	23.3		10.8	10.1		16.2	15.3			14.7	
Level of Service	B	C		B	B		B	B			B	
Approach Delay (s)		23.2			10.3			15.6			14.7	
Approach LOS		C			B			B			B	
<b>Intersection Summary</b>												
HCM Average Control Delay			15.9			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.47									
Actuated Cycle Length (s)			67.6			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			49.2%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												










## HCM Unsignalized Intersection Capacity Analysis 2: Highway 26 & Garden Centre Access-3rd Line

Future (2022) Total PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Free		Free		Stop		Stop					
Grade	0%		0%		0%		0%					
Volume (veh/h)	1	388	67	133	461	1	71	0	118	1	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	422	73	145	501	1	77	0	128	1	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None						None					
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	502			495			1251	1252	458	1343	1288	502
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	502			495			1251	1252	458	1343	1288	502
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			86			42	100	79	99	100	100
cM capacity (veh/h)	1062			1069			134	149	603	91	142	570
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	1	495	145	502	205	1						
Volume Left	1	0	145	0	77	1						
Volume Right	0	73	0	1	128	0						
cSH	1062	1700	1069	1700	260	91						
Volume to Capacity	0.00	0.29	0.14	0.30	0.79	0.01						
Queue Length 95th (m)	0.0	0.0	3.6	0.0	45.6	0.3						
Control Delay (s)	8.4	0.0	8.9	0.0	56.0	45.0						
Lane LOS	A		A		F	E						
Approach Delay (s)	0.0		2.0		56.0	45.0						
Approach LOS					F	E						
Intersection Summary												
Average Delay			9.5									
Intersection Capacity Utilization			51.9%		ICU Level of Service		A					
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis 3: Sideroad 7 & 3rd Line

















Future (2022) Total PM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	44	2	0	12	18	40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	48	2	0	13	20	43
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	54	41	63			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	54	41	63			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	100	100			
cM capacity (veh/h)	954	1030	1540			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	50	13	63			
Volume Left	48	0	0			
Volume Right	2	0	43			
cSH	957	1540	1700			
Volume to Capacity	0.05	0.00	0.04			
Queue Length 95th (m)	1.3	0.0	0.0			
Control Delay (s)	9.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	9.0	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		3.6				
Intersection Capacity Utilization		13.4%		ICU Level of Service		A
Analysis Period (min)		15				



















# HCM Unsignalized Intersection Capacity Analysis 4: Sideroad 7 & Grey County 7

Future (2022) Total PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	5	0	19	6	16	3	40	23	15	41	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	5	0	21	7	17	3	43	25	16	45	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	162	154	47	145	144	56	49			68		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	162	154	47	145	144	56	49			68		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	100	97	99	98	100			99		
cM capacity (veh/h)	776	728	1023	812	738	1011	1558			1533		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	9	45	72	65								
Volume Left	3	21	3	16								
Volume Right	0	17	25	4								
cSH	745	866	1558	1533								
Volume to Capacity	0.01	0.05	0.00	0.01								
Queue Length 95th (m)	0.3	1.2	0.0	0.2								
Control Delay (s)	9.9	9.4	0.3	1.9								
Lane LOS	A	A	A	A								
Approach Delay (s)	9.9	9.4	0.3	1.9								
Approach LOS	A	A										
Intersection Summary												
Average Delay			3.4									
Intersection Capacity Utilization		18.7%		ICU Level of Service		A						
Analysis Period (min)		15										










# HCM Unsignalized Intersection Capacity Analysis 5: Sideroad 10 & Site Access 2 & 3rd Line

Future (2022) Total PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	21	0	73	0	40	23	83	30	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	23	0	79	0	43	25	90	33	2
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	349	283	34	270	271	56	35			68		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	349	283	34	270	271	56	35			68		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	96	100	92	100			94		
cM capacity (veh/h)	533	589	1040	652	598	1011	1577			1533		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	0	102	68	125								
Volume Left	0	23	0	90								
Volume Right	0	79	25	2								
cSH	1700	900	1577	1533								
Volume to Capacity	0.00	0.11	0.00	0.06								
Queue Length 95th (m)	0.0	2.9	0.0	1.4								
Control Delay (s)	0.0	9.5	0.0	5.5								
Lane LOS	A	A		A								
Approach Delay (s)	0.0	9.5	0.0	5.5								
Approach LOS	A	A										
Intersection Summary												
Average Delay			5.6									
Intersection Capacity Utilization		25.3%		ICU Level of Service						A		
Analysis Period (min)			15									










# HCM Unsignalized Intersection Capacity Analysis 6: Site Access 3 & 3rd Line

Future (2022) Total PM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	56	0	0	51
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	61	0	0	55
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	116	61			61	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	116	61			61	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	880	1004			1542	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	61	55			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1542			
Volume to Capacity	0.00	0.04	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay		0.0				
Intersection Capacity Utilization		6.7%		ICU Level of Service		A
Analysis Period (min)		15				

# HCM Unsignalized Intersection Capacity Analysis 7: Site Access 2 & 3rd Line


















Future (2022) Total PM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	25	83	86	27	95	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	90	93	29	103	98
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	412	108			123	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	412	108			123	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	90			93	
cM capacity (veh/h)	554	946			1464	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	117	123	201			
Volume Left	27	0	103			
Volume Right	90	29	0			
cSH	813	1700	1464			
Volume to Capacity	0.14	0.07	0.07			
Queue Length 95th (m)	3.8	0.0	1.7			
Control Delay (s)	10.2	0.0	4.2			
Lane LOS	B		A			
Approach Delay (s)	10.2	0.0	4.2			
Approach LOS	B					
Intersection Summary						
Average Delay		4.6				
Intersection Capacity Utilization		29.8%		ICU Level of Service		A
Analysis Period (min)		15				

# HCM Signalized Intersection Capacity Analysis

Future (2022) Total SAT

## 1: Highway 12-McKibbin Drive & St Vincent Street-Grey County Road 7

												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SEL
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0		4.0		4.0
Lane Util. Factor		1.00					1.00	1.00		1.00		1.00
Frt		0.88					1.00	0.85		1.00		1.00
Flt Protected		0.99					0.96	1.00		0.97		0.95
Satd. Flow (prot)		1654					1813	1601		1826		1789
Flt Permitted		0.95					0.72	1.00		0.79		0.26
Satd. Flow (perm)		1579					1363	1601		1483		487
Volume (vph)	1	1	5	6	2	102	29	8	67	46	2	4
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	5	7	2	111	32	9	73	50	2	4
RTOR Reduction (vph)	0	7	0	0	0	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	7	0	0	0	0	145	5	0	125	0	4
Turn Type	Perm				Perm	Perm		Perm	Perm			Perm
Protected Phases		9					2			6		
Permitted Phases	9				2	2		2	6			4
Actuated Green, G (s)		1.4					47.2	47.2		47.2		23.4
Effective Green, g (s)		3.4					49.2	49.2		49.2		25.4
Actuated g/C Ratio		0.04					0.55	0.55		0.55		0.28
Clearance Time (s)		6.0					6.0	6.0		6.0		6.0
Vehicle Extension (s)		3.0					3.0	3.0		3.0		3.0
Lane Grp Cap (vph)		60					745	875		811		137
v/s Ratio Prot												
v/s Ratio Perm		c0.00					c0.11	0.00		0.08		0.01
v/c Ratio		0.12					0.19	0.01		0.15		0.03
Uniform Delay, d1		41.9					10.3	9.3		10.1		23.4
Progression Factor		1.00					1.00	1.00		1.00		1.00
Incremental Delay, d2		0.9					0.6	0.0		0.4		0.1
Delay (s)		42.8					10.9	9.3		10.5		23.5
Level of Service		D					B	A		B		C
Approach Delay (s)		42.8					10.8			10.5		
Approach LOS		D					B			B		
<b>Intersection Summary</b>												
HCM Average Control Delay		34.9					HCM Level of Service			C		
HCM Volume to Capacity ratio		0.42										
Actuated Cycle Length (s)		90.0					Sum of lost time (s)			12.0		
Intersection Capacity Utilization		49.6%					ICU Level of Service			A		
Analysis Period (min)		15										
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

Future (2022) Total SAT

## 1: Highway 12-McKibbin Drive & St Vincent Street-Grey County Road 7






















Movement	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations	PT				PT	PT	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0				4.0	4.0	
Lane Util. Factor	1.00				1.00	1.00	
Frt	0.99				1.00	0.99	
Flt Protected	1.00				0.95	1.00	
Satd. Flow (prot)	1856				1789	1866	
Flt Permitted	1.00				0.16	1.00	
Satd. Flow (perm)	1856				297	1866	
Volume (vph)	395	38	5	1	5	327	21
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	429	41	5	1	5	355	23
RTOR Reduction (vph)	1	0	0	0	0	3	0
Lane Group Flow (vph)	474	0	0	0	6	375	0
Turn Type				Perm	Perm		
Protected Phases	4					8	
Permitted Phases				8	8		
Actuated Green, G (s)	23.4				23.4	23.4	
Effective Green, g (s)	25.4				25.4	25.4	
Actuated g/C Ratio	0.28				0.28	0.28	
Clearance Time (s)	6.0				6.0	6.0	
Vehicle Extension (s)	3.0				3.0	3.0	
Lane Grp Cap (vph)	524				84	527	
v/s Ratio Prot	0.26					0.20	
v/s Ratio Perm					0.02		
v/c Ratio	0.91				0.07	0.71	
Uniform Delay, d1	31.1				23.7	29.0	
Progression Factor	1.00				1.00	1.00	
Incremental Delay, d2	19.0				0.4	4.5	
Delay (s)	50.2				24.0	33.5	
Level of Service	D				C	C	
Approach Delay (s)	50.0					33.4	
Approach LOS	D					C	
Intersection Summary							

## Queues

Future (2022) Total SAT

## 1: Highway 12-McKibbon Drive &amp; St Vincent Street-Grey County Road 7

												
Lane Group	EBL2	EBL	NBL2	NBL	NBT	NBR	SBL	SBT	SEL	SET	NWL2	NWL
Lane Configurations												
Volume (vph)	1	1	2	102	29	8	67	46	4	395	1	5
Lane Group Flow (vph)	0	14	0	0	145	9	0	125	4	475	0	6
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm		Perm	Perm
Protected Phases		9			2			6		4		
Permitted Phases	9		2	2		2	6		4		8	8
Detector Phases	9	9	2	2	2	2	6	6	4	4	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio		0.09			0.18	0.01		0.14	0.03	0.91		0.07
Control Delay		28.5			10.3	6.0		9.9	23.8	54.2		26.2
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay		28.5			10.3	6.0		9.9	23.8	54.2		26.2
Queue Length 50th (m)		1.1			9.6	0.0		8.1	0.5	78.0		0.8
Queue Length 95th (m)		6.6			25.8	2.4		22.3	3.0	#132.8		3.8
Internal Link Dist (m)		68.1			4538.6			763.0		331.6		
Turn Bay Length (m)												
Base Capacity (vph)		477			804	964		866	146	537		84
Starvation Cap Reductn		0			0	0		0	0	0		0
Spillback Cap Reductn		0			0	0		0	0	0		0
Storage Cap Reductn		0			0	0		0	0	0		0
Reduced v/c Ratio		0.03			0.18	0.01		0.14	0.03	0.88		0.07

## Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

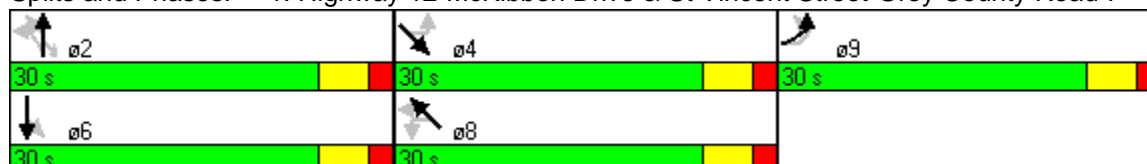
Natural Cycle: 70

Control Type: Actuated-Coordinated

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Highway 12-McKibbon Drive &amp; St Vincent Street-Grey County Road 7



## 1: Highway 12-McKibbin Drive &amp; St Vincent Street-Grey County Road 7

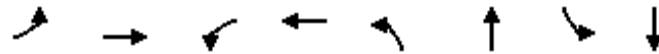


Lane Group	NWT
Lane Configurations	P
Volume (vph)	327
Lane Group Flow (vph)	378
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	8
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	30.0
Total Split (%)	33.3%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	0.71
Control Delay	37.2
Queue Delay	0.0
Total Delay	37.2
Queue Length 50th (m)	57.4
Queue Length 95th (m)	88.0
Internal Link Dist (m)	393.4
Turn Bay Length (m)	
Base Capacity (vph)	542
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.70
Intersection Summary	



Queues  
2: Highway 26 & Garden Centre Access-3rd Line

Future (2022) Total SAT  
Signalized



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	4	372	112	381	79	0	1	0
Lane Group Flow (vph)	4	527	122	414	86	177	0	5
Turn Type	Perm		pm+pt		pm+pt		Perm	
Protected Phases		4	3	8	5	2		6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	3	8	5	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	10.0	22.0	10.0	22.0	22.0	22.0
Total Split (s)	43.0	43.0	13.0	56.0	11.0	34.0	23.0	23.0
Total Split (%)	47.8%	47.8%	14.4%	62.2%	12.2%	37.8%	25.6%	25.6%
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
Lead/Lag	Lag	Lag	Lead		Lead		Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	Max
v/c Ratio	0.01	0.79	0.34	0.45	0.15	0.19		0.01
Control Delay	15.2	30.1	12.1	13.5	19.8	0.5		19.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	15.2	30.1	12.1	13.5	19.8	0.5		19.6
Queue Length 50th (m)	0.4	67.3	8.9	35.9	8.4	0.0		0.1
Queue Length 95th (m)	2.3	101.8	16.4	54.4	20.6	0.0		2.9
Internal Link Dist (m)		82.1		668.4		114.4		99.1
Turn Bay Length (m)	15.0		30.0					
Base Capacity (vph)	438	826	367	1088	561	914		481
Starvation Cap Reductn	0	0	0	0	0	0		0
Spillback Cap Reductn	0	0	0	0	0	0		0
Storage Cap Reductn	0	0	0	0	0	0		0
Reduced v/c Ratio	0.01	0.64	0.33	0.38	0.15	0.19		0.01

Intersection Summary

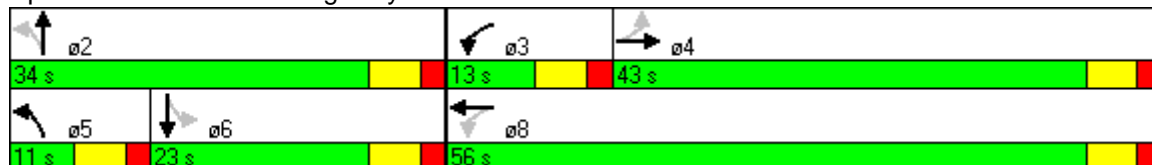
Cycle Length: 90

Actuated Cycle Length: 76.9

Natural Cycle: 65




















Control Type: Semi Act-Uncoord

Splits and Phases: 2: Highway 26 & Garden Centre Access-3rd Line



HCM Signalized Intersection Capacity Analysis  
2: Highway 26 & Garden Centre Access-3rd Line

















Future (2022) Total SAT  
Signalized

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.96		1.00	1.00		1.00	0.85			0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1789	1818		1789	1883		1789	1601			1663	
Flt Permitted	0.52	1.00		0.15	1.00		0.72	1.00			0.96	
Satd. Flow (perm)	979	1818		288	1883		1365	1601			1615	
Volume (vph)	4	372	113	112	381	0	79	0	163	1	0	4
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	404	123	122	414	0	86	0	177	1	0	4
RTOR Reduction (vph)	0	14	0	0	0	0	0	105	0	0	3	0
Lane Group Flow (vph)	4	513	0	122	414	0	86	72	0	0	2	0
Turn Type	Perm			pm+pt			pm+pt			Perm		
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	25.8	25.8		37.0	37.0		30.5	30.5			20.8	
Effective Green, g (s)	27.8	27.8		39.0	39.0		32.5	32.5			22.8	
Actuated g/C Ratio	0.35	0.35		0.49	0.49		0.41	0.41			0.29	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	342	636		277	924		588	654			463	
v/s Ratio Prot		c0.28		0.04	c0.22		c0.01	0.05				
v/s Ratio Perm	0.00			0.18			c0.05				0.00	
v/c Ratio	0.01	0.81		0.44	0.45		0.15	0.11			0.00	
Uniform Delay, d1	16.9	23.4		14.4	13.2		14.7	14.6			20.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	7.4		1.1	0.3		0.1	0.3			0.0	
Delay (s)	16.9	30.8		15.5	13.6		14.8	14.9			20.3	
Level of Service	B	C		B	B		B	B			C	
Approach Delay (s)		30.7			14.0			14.9			20.3	
Approach LOS		C			B			B			C	
<b>Intersection Summary</b>												
HCM Average Control Delay			20.9			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			79.5			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			53.7%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

## HCM Unsignalized Intersection Capacity Analysis

### 2: Highway 26 & Garden Centre Access-3rd Line










Future (2022) Total SAT

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	4	372	115	118	381	0	79	0	163	1	0	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	404	125	128	414	0	86	0	177	1	0	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	414			529			1151	1146	467	1323	1209	414
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	414			529			1151	1146	467	1323	1209	414
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			88			45	100	70	99	100	99
cM capacity (veh/h)	1145			1038			157	174	596	84	160	638
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	534	542	263	5								
Volume Left	4	128	86	1								
Volume Right	125	0	177	4								
cSH	1145	1038	312	276								
Volume to Capacity	0.00	0.12	0.84	0.02								
Queue Length 95th (m)	0.1	3.2	55.9	0.5								
Control Delay (s)	0.1	3.2	56.5	18.3								
Lane LOS	A	A	F	C								
Approach Delay (s)	0.1	3.2	56.5	18.3								
Approach LOS			F	C								
Intersection Summary												
Average Delay			12.5									
Intersection Capacity Utilization			84.4%	ICU Level of Service						E		
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 3: Sideroad 7 & 3rd Line

















Future (2022) Total SAT

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	72	5	0	16	26	63
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	78	5	0	17	28	68
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	80	62	97			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	80	62	97			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	99	100			
cM capacity (veh/h)	923	1002	1497			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	84	17	97			
Volume Left	78	0	0			
Volume Right	5	0	68			
cSH	927	1497	1700			
Volume to Capacity	0.09	0.00	0.06			
Queue Length 95th (m)	2.3	0.0	0.0			
Control Delay (s)	9.3	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	9.3	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		3.9				
Intersection Capacity Utilization		16.2%		ICU Level of Service		A
Analysis Period (min)		15				

# HCM Unsignalized Intersection Capacity Analysis

















## 4: Sideroad 7 & Grey County 7

Future (2022) Total SAT

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	6	10	3	36	10	19	6	81	23	33	70	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	11	3	39	11	21	7	88	25	36	76	10
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	292	279	81	275	271	101	86			113		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	292	279	81	275	271	101	86			113		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	98	100	94	98	98	100			98		
cM capacity (veh/h)	623	611	979	652	617	955	1510			1476		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	21	71	120	122								
Volume Left	7	39	7	36								
Volume Right	3	21	25	10								
cSH	654	712	1510	1476								
Volume to Capacity	0.03	0.10	0.00	0.02								
Queue Length 95th (m)	0.7	2.5	0.1	0.6								
Control Delay (s)	10.7	10.6	0.4	2.3								
Lane LOS	B	B	A	A								
Approach Delay (s)	10.7	10.6	0.4	2.3								
Approach LOS	B	B										
Intersection Summary												
Average Delay			3.9									
Intersection Capacity Utilization		25.7%			ICU Level of Service					A		
Analysis Period (min)		15										










# HCM Unsignalized Intersection Capacity Analysis 5: Sideroad 10 & Site Access 2 & 3rd Line

Future (2022) Total SAT

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	37	0	103	5	47	36	108	59	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	40	0	112	5	51	39	117	64	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	495	402	66	383	385	71	68			90		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	495	402	66	383	385	71	68			90		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	93	100	89	100			92		
cM capacity (veh/h)	404	493	997	540	504	992	1533			1505		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	0	152	96	186								
Volume Left	0	40	5	117								
Volume Right	0	112	39	4								
cSH	1700	812	1533	1505								
Volume to Capacity	0.00	0.19	0.00	0.08								
Queue Length 95th (m)	0.0	5.2	0.1	1.9								
Control Delay (s)	0.0	10.5	0.4	5.0								
Lane LOS	A	B	A	A								
Approach Delay (s)	0.0	10.5	0.4	5.0								
Approach LOS	A	B										
Intersection Summary												
Average Delay			5.9									
Intersection Capacity Utilization	31.1%		ICU Level of Service		A							
Analysis Period (min)	15											

# HCM Unsignalized Intersection Capacity Analysis 6: Site Access 3 & 3rd Line










Future (2022) Total SAT

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	0	0	88	0	0	96
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	96	0	0	104
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	200	96			96	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	200	96			96	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	789	961			1498	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	96	104			
Volume Left	0	0	0			
Volume Right	0	0	0			
cSH	1700	1700	1498			
Volume to Capacity	0.00	0.06	0.00			
Queue Length 95th (m)	0.0	0.0	0.0			
Control Delay (s)	0.0	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	0.0	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay		0.0				
Intersection Capacity Utilization		8.4%		ICU Level of Service	A	
Analysis Period (min)		15				

# HCM Unsignalized Intersection Capacity Analysis

## 7: Site Access 2 & 3rd Line

Future (2022) Total SAT

















						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	41	107	114	36	102	130
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	45	116	124	39	111	141
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	507	143			163	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	507	143			163	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	87			92	
cM capacity (veh/h)	485	904			1416	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	161	163	252			
Volume Left	45	0	111			
Volume Right	116	39	0			
cSH	729	1700	1416			
Volume to Capacity	0.22	0.10	0.08			
Queue Length 95th (m)	6.4	0.0	1.9			
Control Delay (s)	11.3	0.0	3.8			
Lane LOS	B		A			
Approach Delay (s)	11.3	0.0	3.8			
Approach LOS	B					
Intersection Summary						
Average Delay		4.8				
Intersection Capacity Utilization		39.5%		ICU Level of Service		A
Analysis Period (min)		15				



**APPENDIX I**  
**Future (2028) Total Traffic Conditions**  
**Analysis Outputs**  
Level of Service Calculations

HCM Signalized Intersection Capacity Analysis  
1: Highway 26-McKibbin Drive & St Vincent Street-Grey County 7

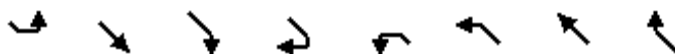
Future (2028) Total AM

												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SBR2
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0		4.0		
Lane Util. Factor		1.00					1.00	1.00		1.00		
Frt		0.88					1.00	0.85		0.99		
Flt Protected		1.00					0.97	1.00		0.98		
Satd. Flow (prot)		1645					1818	1601		1822		
Flt Permitted		0.97					0.75	1.00		0.85		
Satd. Flow (perm)		1597					1421	1601		1579		
Volume (vph)	1	1	9	9	1	81	32	8	51	52	1	8
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	10	10	1	88	35	9	55	57	1	9
RTOR Reduction (vph)	0	9	0	0	0	0	0	4	0	2	0	0
Lane Group Flow (vph)	0	13	0	0	0	0	124	5	0	120	0	0
Turn Type	Perm				Perm		Perm	Perm		Perm		
Protected Phases	9						2			6		
Permitted Phases	9				2		2	2		6		
Actuated Green, G (s)	2.9						46.6	46.6		46.6		
Effective Green, g (s)	4.9						48.6	48.6		48.6		
Actuated g/C Ratio	0.05						0.54	0.54		0.54		
Clearance Time (s)	6.0						6.0	6.0		6.0		
Vehicle Extension (s)	3.0						3.0	3.0		3.0		
Lane Grp Cap (vph)	87						767	865		853		
v/s Ratio Prot												
v/s Ratio Perm	c0.01						c0.09	0.00		0.08		
v/c Ratio	0.14						0.16	0.01		0.14		
Uniform Delay, d1	40.6						10.4	9.6		10.3		
Progression Factor	1.00						1.00	1.00		1.00		
Incremental Delay, d2	0.8						0.5	0.0		0.3		
Delay (s)	41.3						10.9	9.6		10.7		
Level of Service	D						B	A		B		
Approach Delay (s)	41.3						10.8			10.7		
Approach LOS	D						B			B		
Intersection Summary												
HCM Average Control Delay	34.6				HCM Level of Service				C			
HCM Volume to Capacity ratio	0.37											
Actuated Cycle Length (s)	90.0				Sum of lost time (s)				12.0			
Intersection Capacity Utilization	47.0%				ICU Level of Service				A			
Analysis Period (min)	15											
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 1: Highway 26-McKibbin Drive & St Vincent Street-Grey County 7

Future (2028) Total AM






















Movement	SEL	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations								
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	1.00				1.00	1.00	
Frt	1.00	0.99				1.00	0.99	
Flt Protected	0.95	1.00				0.95	1.00	
Satd. Flow (prot)	1789	1874				1789	1868	
Flt Permitted	0.18	1.00				0.17	1.00	
Satd. Flow (perm)	340	1874				318	1868	
Volume (vph)	4	380	12	2	3	3	365	21
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	413	13	2	3	3	397	23
RTOR Reduction (vph)	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	4	428	0	0	0	6	418	0
Turn Type	Perm		Perm			Perm		
Protected Phases	4					8		
Permitted Phases	4		8			8		
Actuated Green, G (s)	22.5	22.5				22.5	22.5	
Effective Green, g (s)	24.5	24.5				24.5	24.5	
Actuated g/C Ratio	0.27	0.27				0.27	0.27	
Clearance Time (s)	6.0	6.0				6.0	6.0	
Vehicle Extension (s)	3.0	3.0				3.0	3.0	
Lane Grp Cap (vph)	93	510				87	509	
v/s Ratio Prot	c0.23					0.22		
v/s Ratio Perm	0.01					0.02		
v/c Ratio	0.04	0.84				0.07	0.82	
Uniform Delay, d1	24.1	30.9				24.3	30.7	
Progression Factor	1.00	1.00				1.00	1.00	
Incremental Delay, d2	0.2	11.6				0.3	10.2	
Delay (s)	24.3	42.5				24.6	40.9	
Level of Service	C	D				C	D	
Approach Delay (s)	42.3					40.7		
Approach LOS	D					D		

### Intersection Summary

## Queues

Future (2028) Total AM

## 1: Highway 26-McKibbin Drive &amp; St Vincent Street-Grey County 7

												
Lane Group	EBL2	EBL	NBL2	NBL	NBT	NBR	SBL	SBT	SEL	SET	NWL2	NWL
Lane Configurations												
Volume (vph)	1	1	1	81	32	8	51	52	4	380	3	3
Lane Group Flow (vph)	0	22	0	0	124	9	0	122	4	428	0	6
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm		Perm	Perm
Protected Phases		9			2			6		4		
Permitted Phases	9		2	2		2	6		4		8	8
Detector Phases	9	9	2	2	2	2	6	6	4	4	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio		0.14			0.15	0.01		0.14	0.04	0.84		0.06
Control Delay		28.2			11.7	7.1		11.1	24.2	46.9		25.2
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay		28.2			11.7	7.1		11.1	24.2	46.9		25.2
Queue Length 50th (m)		2.0			8.0	0.0		7.6	0.5	67.9		0.8
Queue Length 95th (m)		8.8			22.6	2.5		21.4	3.0	#112.0		3.7
Internal Link Dist (m)		68.1			4538.6			763.0		331.6		
Turn Bay Length (m)												
Base Capacity (vph)		479			820	932		898	114	541		108
Starvation Cap Reductn		0			0	0		0	0	0		0
Spillback Cap Reductn		0			0	0		0	0	0		0
Storage Cap Reductn		0			0	0		0	0	0		0
Reduced v/c Ratio		0.05			0.15	0.01		0.14	0.04	0.79		0.06

## Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

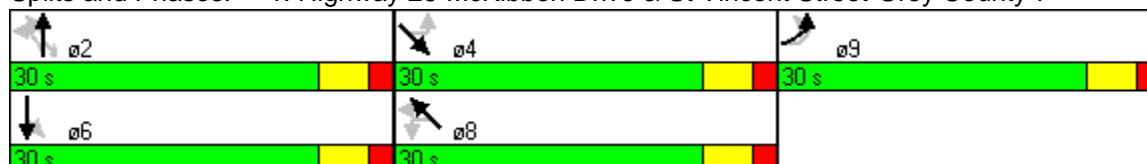
Natural Cycle: 70

Control Type: Actuated-Coordinated

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Highway 26-McKibbin Drive &amp; St Vincent Street-Grey County 7



















## 1: Highway 26-McKibbin Drive &amp; St Vincent Street-Grey County 7



Lane Group	NWT
Lane Configurations	P
Volume (vph)	365
Lane Group Flow (vph)	420
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	8
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	30.0
Total Split (%)	33.3%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	0.82
Control Delay	45.0
Queue Delay	0.0
Total Delay	45.0
Queue Length 50th (m)	65.9
Queue Length 95th (m)	108.5
Internal Link Dist (m)	393.4
Turn Bay Length (m)	
Base Capacity (vph)	542
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.77
Intersection Summary	













HCM Signalized Intersection Capacity Analysis  
1: Highway 26-McKibbin Drive & St Vincent Street-Grey County 7

Future (2028) Total AM  
Optimized

												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SBR2
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0		4.0		
Lane Util. Factor		1.00					1.00	1.00		1.00		
Frt		0.88					1.00	0.85		0.99		
Flt Protected		1.00					0.97	1.00		0.98		
Satd. Flow (prot)		1645					1818	1601		1822		
Flt Permitted		0.97					0.75	1.00		0.84		
Satd. Flow (perm)		1597					1405	1601		1566		
Volume (vph)	1	1	9	9	1	81	32	8	51	52	1	8
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	10	10	1	88	35	9	55	57	1	9
RTOR Reduction (vph)	0	10	0	0	0	0	0	4	0	1	0	0
Lane Group Flow (vph)	0	12	0	0	0	0	124	5	0	121	0	0
Turn Type	Perm				Perm		Perm	Perm		Perm		
Protected Phases	9						2			6		
Permitted Phases	9				2		2	2		6		
Actuated Green, G (s)	3.1						68.4	68.4		68.4		
Effective Green, g (s)	5.1						70.4	70.4		70.4		
Actuated g/C Ratio	0.04						0.59	0.59		0.59		
Clearance Time (s)	6.0						6.0	6.0		6.0		
Vehicle Extension (s)	3.0						3.0	3.0		3.0		
Lane Grp Cap (vph)	68						824	939		919		
v/s Ratio Prot												
v/s Ratio Perm	c0.01						c0.09	0.00		0.08		
v/c Ratio	0.18						0.15	0.01		0.13		
Uniform Delay, d1	55.4						11.2	10.3		11.1		
Progression Factor	1.00						1.00	1.00		1.00		
Incremental Delay, d2	1.3						0.4	0.0		0.3		
Delay (s)	56.7						11.6	10.3		11.4		
Level of Service	E						B	B		B		
Approach Delay (s)	56.7						11.5			11.4		
Approach LOS	E						B			B		
Intersection Summary												
HCM Average Control Delay	43.2				HCM Level of Service				D			
HCM Volume to Capacity ratio	0.36											
Actuated Cycle Length (s)	120.0				Sum of lost time (s)				12.0			
Intersection Capacity Utilization	47.0%				ICU Level of Service				A			
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
1: Highway 26-McKibbin Drive & St Vincent Street-Grey County 7

Future (2028) Total AM  
Optimized

								
Movement	SEL	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations								
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	1.00				1.00	1.00	
Frt	1.00	0.99				1.00	0.99	
Flt Protected	0.95	1.00				0.95	1.00	
Satd. Flow (prot)	1789	1874				1789	1868	
Flt Permitted	0.16	1.00				0.15	1.00	
Satd. Flow (perm)	296	1874				274	1868	
Volume (vph)	4	380	12	2	3	3	365	21
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	413	13	2	3	3	397	23
RTOR Reduction (vph)	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	4	428	0	0	0	6	418	0
Turn Type	Perm					Perm	Perm	
Protected Phases		4					8	
Permitted Phases	4				8	8		
Actuated Green, G (s)	30.5	30.5				30.5	30.5	
Effective Green, g (s)	32.5	32.5				32.5	32.5	
Actuated g/C Ratio	0.27	0.27				0.27	0.27	
Clearance Time (s)	6.0	6.0				6.0	6.0	
Vehicle Extension (s)	3.0	3.0				3.0	3.0	
Lane Grp Cap (vph)	80	508				74	506	
v/s Ratio Prot		c0.23					0.22	
v/s Ratio Perm	0.01					0.02		
v/c Ratio	0.05	0.84				0.08	0.83	
Uniform Delay, d1	32.3	41.3				32.6	41.1	
Progression Factor	1.00	1.00				1.00	1.00	
Incremental Delay, d2	0.3	12.1				0.5	10.6	
Delay (s)	32.6	53.4				33.1	51.7	
Level of Service	C	D				C	D	
Approach Delay (s)		53.2					51.4	
Approach LOS		D					D	
Intersection Summary								

## Queues

## 1: Highway 26-McKibbon Drive &amp; St Vincent Street-Grey County 7

Future (2028) Total AM

Optimized



Lane Group	EBL2	EBL	NBL2	NBL	NBT	NBR	SBL	SBT	SEL	SET	NWL2	NWL
Lane Configurations												
Volume (vph)	1	1	1	81	32	8	51	52	4	380	3	3
Lane Group Flow (vph)	0	22	0	0	124	9	0	122	4	428	0	6
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm		Perm	Perm
Protected Phases		9			2			6		4		
Permitted Phases	9		2	2		2	6		4		8	8
Detector Phases	9	9	2	2	2	2	6	6	4	4	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	30.0	30.0	34.0	34.0	34.0	34.0	34.0	34.0	56.0	56.0	56.0	56.0
Total Split (%)	25.0%	25.0%	28.3%	28.3%	28.3%	28.3%	28.3%	28.3%	46.7%	46.7%	46.7%	46.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio		0.18			0.15	0.01		0.13	0.02	0.84		0.03
Control Delay		38.1			13.7	8.8		13.1	28.0	56.2		28.5
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay		38.1			13.7	8.8		13.1	28.0	56.2		28.5
Queue Length 50th (m)		2.7			9.9	0.0		9.3	0.7	95.7		1.1
Queue Length 95th (m)		10.8			29.5	2.9		28.0	3.1	118.9		4.0
Internal Link Dist (m)		68.1			4538.6			763.0		331.6		
Turn Bay Length (m)												
Base Capacity (vph)		361			822	990		946	286	812		280
Starvation Cap Reductn		0			0	0		0	0	0		0
Spillback Cap Reductn		0			0	0		0	0	0		0
Storage Cap Reductn		0			0	0		0	0	0		0
Reduced v/c Ratio		0.06			0.15	0.01		0.13	0.01	0.53		0.02

## Intersection Summary

Cycle Length: 120






Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Splits and Phases: 1: Highway 26-McKibbon Drive &amp; St Vincent Street-Grey County 7

 ø2	 ø4	 ø9
34 s	56 s	30 s
 ø6	 ø8	
34 s	56 s	




## Queues

1: Highway 26-McKibbin Drive &amp; St Vincent Street-Grey County 7

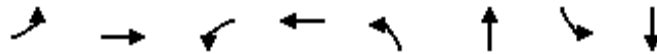
Future (2028) Total AM

Optimized



Lane Group	NWT
Lane Configurations	8
Volume (vph)	365
Lane Group Flow (vph)	420
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	8
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	56.0
Total Split (%)	46.7%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	0.83
Control Delay	54.3
Queue Delay	0.0
Total Delay	54.3
Queue Length 50th (m)	92.8
Queue Length 95th (m)	115.9
Internal Link Dist (m)	393.4
Turn Bay Length (m)	
Base Capacity (vph)	811
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.52
Intersection Summary	

## 2: Highway 26 &amp; Garden Centre Access-3rd Line



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	1	355	92	279	67	0	1	0
Lane Group Flow (vph)	1	437	100	303	73	138	0	2
Turn Type	Perm		pm+pt		Perm		Perm	
Protected Phases		4	3	8		2		6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	3	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	10.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	44.0	44.0	21.0	65.0	25.0	25.0	25.0	25.0
Total Split (%)	48.9%	48.9%	23.3%	72.2%	27.8%	27.8%	27.8%	27.8%
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
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Max	Max	Max	Max
v/c Ratio	0.00	0.68	0.21	0.32	0.14	0.15		0.00
Control Delay	13.0	23.2	7.6	8.7	19.2	0.3		16.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	13.0	23.2	7.6	8.7	19.2	0.3		16.5
Queue Length 50th (m)	0.1	42.6	5.2	17.6	6.0	0.0		0.1
Queue Length 95th (m)	0.9	70.8	10.4	28.7	17.8	0.0		1.6
Internal Link Dist (m)		82.1		668.4		114.4		99.1
Turn Bay Length (m)	15.0		30.0					
Base Capacity (vph)	545	936	564	1276	511	935		578
Starvation Cap Reductn	0	0	0	0	0	0		0
Spillback Cap Reductn	0	0	0	0	0	0		0
Storage Cap Reductn	0	0	0	0	0	0		0
Reduced v/c Ratio	0.00	0.47	0.18	0.24	0.14	0.15		0.00

## Intersection Summary

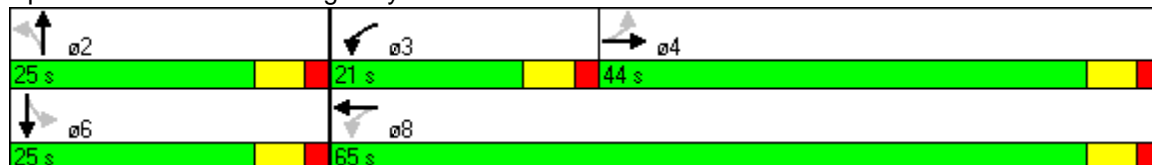
Cycle Length: 90

Actuated Cycle Length: 61.6

Natural Cycle: 55




















Control Type: Semi Act-Uncoord

Splits and Phases: 2: Highway 26 &amp; Garden Centre Access-3rd Line












## HCM Signalized Intersection Capacity Analysis 2: Highway 26 & Garden Centre Access-3rd Line

Future (2028) Total AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.85			0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	
Satd. Flow (prot)	1789	1850		1789	1883		1789	1601			1713	
Flt Permitted	0.58	1.00		0.24	1.00		0.76	1.00			0.92	
Satd. Flow (perm)	1084	1850		447	1883		1425	1601			1623	
Volume (vph)	1	355	47	92	279	0	67	0	127	1	0	1
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	386	51	100	303	0	73	0	138	1	0	1
RTOR Reduction (vph)	0	7	0	0	0	0	0	90	0	0	1	0
Lane Group Flow (vph)	1	430	0	100	303	0	73	48	0	0	1	0
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	19.0	19.0		30.6	30.6		20.0	20.0			20.0	
Effective Green, g (s)	21.0	21.0		32.6	32.6		22.0	22.0			22.0	
Actuated g/C Ratio	0.34	0.34		0.52	0.52		0.35	0.35			0.35	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	364	621		396	981		501	563			570	
v/s Ratio Prot		c0.23		0.03	c0.16			0.03				
v/s Ratio Perm	0.00			0.10			c0.05				0.00	
v/c Ratio	0.00	0.69		0.25	0.31		0.15	0.09			0.00	
Uniform Delay, d1	13.8	18.0		9.2	8.6		13.9	13.6			13.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	3.3		0.3	0.2		0.6	0.3			0.0	
Delay (s)	13.8	21.4		9.5	8.7		14.5	13.9			13.2	
Level of Service	B	C		A	A		B	B			B	
Approach Delay (s)		21.3			8.9			14.1			13.2	
Approach LOS		C			A			B			B	
<b>Intersection Summary</b>												
HCM Average Control Delay			15.1			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.41									
Actuated Cycle Length (s)			62.6			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			44.5%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Unsignalized Intersection Capacity Analysis 3: Sideroad 7 & 3rd Line

















Future (2028) Total AM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	42	0	7	22	15	51
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	0	8	24	16	55
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	83	44	72			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	83	44	72			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	100	100			
cM capacity (veh/h)	914	1026	1528			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	46	32	72			
Volume Left	46	8	0			
Volume Right	0	0	55			
cSH	914	1528	1700			
Volume to Capacity	0.05	0.00	0.04			
Queue Length 95th (m)	1.2	0.1	0.0			
Control Delay (s)	9.1	1.8	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.1	1.8	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		3.2				
Intersection Capacity Utilization		17.3%		ICU Level of Service		A
Analysis Period (min)		15				

# HCM Unsignalized Intersection Capacity Analysis



















## 4: Sideroad 7 & Grey County 7

Future (2028) Total AM

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Sign Control		Stop			Stop			Free			Free									
Grade		0%			0%			0%			0%									
Volume (veh/h)	3	5	9	29	10	15	9	60	24	13	66	1								
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92								
Hourly flow rate (vph)	3	5	10	32	11	16	10	65	26	14	72	1								
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	220	211	72	211	199	78	73			91										
vC1, stage 1 conf vol																				
vC2, stage 2 conf vol																				
vCu, unblocked vol	220	211	72	211	199	78	73			91										
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1										
tC, 2 stage (s)																				
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2										
p0 queue free %	100	99	99	96	98	98	99			99										
cM capacity (veh/h)	706	675	990	725	686	982	1527			1504										
Direction, Lane #	EB 1	WB 1	NB 1	SB 1																
Volume Total	18	59	101	87																
Volume Left	3	32	10	14																
Volume Right	10	16	26	1																
cSH	819	773	1527	1504																
Volume to Capacity	0.02	0.08	0.01	0.01																
Queue Length 95th (m)	0.5	1.9	0.1	0.2																
Control Delay (s)	9.5	10.0	0.8	1.3																
Lane LOS	A	B	A	A																
Approach Delay (s)	9.5	10.0	0.8	1.3																
Approach LOS	A	B																		
Intersection Summary																				
Average Delay			3.6																	
Intersection Capacity Utilization		20.9%		ICU Level of Service		A														
Analysis Period (min)		15																		










# HCM Unsignalized Intersection Capacity Analysis 5: Sideroad 10 & Site Access 2 & 3rd Line

Future (2028) Total AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	23	0	78	5	64	25	55	57	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	25	0	85	5	70	27	60	62	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	349	291	64	276	280	83	66			97		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	349	291	64	276	280	83	66			97		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	96	100	91	100			96		
cM capacity (veh/h)	535	592	1000	654	601	976	1535			1497		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	0	110	5	97	60	66						
Volume Left	0	25	5	0	60	0						
Volume Right	0	85	0	27	0	4						
cSH	1700	878	1535	1700	1497	1700						
Volume to Capacity	0.00	0.13	0.00	0.06	0.04	0.04						
Queue Length 95th (m)	0.0	3.2	0.1	0.0	0.9	0.0						
Control Delay (s)	0.0	9.7	7.4	0.0	7.5	0.0						
Lane LOS	A	A	A		A							
Approach Delay (s)	0.0	9.7	0.4		3.6							
Approach LOS	A	A										
Intersection Summary												
Average Delay			4.6									
Intersection Capacity Utilization			22.5%			ICU Level of Service				A		
Analysis Period (min)			15									











# HCM Unsignalized Intersection Capacity Analysis 6: Site Access 3 & 3rd Line

Future (2028) Total AM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	14	41	52	12	30	50
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	45	57	13	33	54
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	183	63			70	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	183	63			70	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	96			98	
cM capacity (veh/h)	790	1002			1531	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	60	70	87			
Volume Left	15	0	33			
Volume Right	45	13	0			
cSH	937	1700	1531			
Volume to Capacity	0.06	0.04	0.02			
Queue Length 95th (m)	1.6	0.0	0.5			
Control Delay (s)	9.1	0.0	2.9			
Lane LOS	A		A			
Approach Delay (s)	9.1	0.0	2.9			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay		3.7				
Intersection Capacity Utilization		21.0%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis  
7: Site Acces 2 & 3rd Line

Future (2028) Total AM

















						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free		Free	Free
Grade	0%		0%			0%
Volume (veh/h)	18	58	128	14	43	97
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	63	139	15	47	105
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	346	147			154	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	346	147			154	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	93			97	
cM capacity (veh/h)	630	900			1426	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	83	154	47	105		
Volume Left	20	0	47	0		
Volume Right	63	15	0	0		
cSH	817	1700	1426	1700		
Volume to Capacity	0.10	0.09	0.03	0.06		
Queue Length 95th (m)	2.6	0.0	0.8	0.0		
Control Delay (s)	9.9	0.0	7.6	0.0		
Lane LOS	A		A			
Approach Delay (s)	9.9	0.0	2.3			
Approach LOS	A					
Intersection Summary						
Average Delay		3.0				
Intersection Capacity Utilization		25.5%		ICU Level of Service	A	
Analysis Period (min)		15				



# HCM Signalized Intersection Capacity Analysis













## 1: Highway 26-McKibbin Drive & St Vincent Street-Grey County 7

Future (2028) Total PM

												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SBR2
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0		4.0		
Lane Util. Factor		1.00					1.00	1.00		1.00		
Frt		0.89					1.00	0.85		0.99		
Flt Protected		0.99					0.97	1.00		0.97		
Satd. Flow (prot)		1663					1830	1601		1811		
Flt Permitted		0.92					0.75	1.00		0.69		
Satd. Flow (perm)		1553					1406	1601		1298		
Volume (vph)	1	1	4	4	2	92	67	15	131	56	3	6
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	4	4	2	100	73	16	142	61	3	7
RTOR Reduction (vph)	0	4	0	0	0	0	0	9	0	1	0	0
Lane Group Flow (vph)	0	6	0	0	0	0	175	7	0	212	0	0
Turn Type	Perm				Perm		Perm	Perm	Perm	Perm		
Protected Phases	9						2				6	
Permitted Phases	9				2	2		2		6		
Actuated Green, G (s)		1.4					34.6	34.6		34.6		
Effective Green, g (s)		3.4					36.6	36.6		36.6		
Actuated g/C Ratio		0.04					0.41	0.41		0.41		
Clearance Time (s)		6.0					6.0	6.0		6.0		
Vehicle Extension (s)		3.0					3.0	3.0		3.0		
Lane Grp Cap (vph)		59					572	651		528		
v/s Ratio Prot												
v/s Ratio Perm		c0.00					0.12	0.00		c0.16		
v/c Ratio		0.10					0.31	0.01		0.40		
Uniform Delay, d1		41.8					18.1	15.9		18.9		
Progression Factor		1.00					1.00	1.00		1.00		
Incremental Delay, d2		0.8					1.4	0.0		2.3		
Delay (s)		42.6					19.5	15.9		21.2		
Level of Service		D					B	B		C		
Approach Delay (s)		42.6					19.2			21.2		
Approach LOS		D					B			C		
<b>Intersection Summary</b>												
HCM Average Control Delay		43.0					HCM Level of Service			D		
HCM Volume to Capacity ratio		0.69										
Actuated Cycle Length (s)		90.0					Sum of lost time (s)			12.0		
Intersection Capacity Utilization		70.3%					ICU Level of Service			C		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
1: Highway 26-McKibbin Drive & St Vincent Street-Grey County 7




















Future (2028) Total PM

								
Movement	SEL	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations								
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	1.00				1.00	1.00	
Frt	1.00	0.99				1.00	0.99	
Flt Protected	0.95	1.00				0.95	1.00	
Satd. Flow (prot)	1789	1871				1789	1873	
Flt Permitted	0.11	1.00				0.12	1.00	
Satd. Flow (perm)	198	1871				222	1873	
Volume (vph)	8	592	21	6	15	6	720	27
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	643	23	7	16	7	783	29
RTOR Reduction (vph)	0	1	0	0	0	0	2	0
Lane Group Flow (vph)	9	672	0	0	0	23	810	0
Turn Type	Perm				Perm	Perm		
Protected Phases		4					8	
Permitted Phases	4				8	8		
Actuated Green, G (s)	36.0	36.0				36.0	36.0	
Effective Green, g (s)	38.0	38.0				38.0	38.0	
Actuated g/C Ratio	0.42	0.42				0.42	0.42	
Clearance Time (s)	6.0	6.0				6.0	6.0	
Vehicle Extension (s)	3.0	3.0				3.0	3.0	
Lane Grp Cap (vph)	84	790				94	791	
v/s Ratio Prot		0.36					c0.43	
v/s Ratio Perm	0.05					0.10		
v/c Ratio	0.11	0.85				0.24	1.02	
Uniform Delay, d1	15.7	23.4				16.8	26.0	
Progression Factor	1.00	1.00				1.00	1.00	
Incremental Delay, d2	0.6	8.8				1.4	38.3	
Delay (s)	16.3	32.2				18.1	64.3	
Level of Service	B	C				B	E	
Approach Delay (s)		32.0					63.1	
Approach LOS		C					E	
Intersection Summary								

## Queues

Future (2028) Total PM

## 1: Highway 26-McKibbon Drive &amp; St Vincent Street-Grey County 7

												
Lane Group	EBL2	EBL	NBL2	NBL	NBT	NBR	SBL	SBT	SEL	SET	NWL2	NWL
Lane Configurations												
Volume (vph)	1	1	2	92	67	15	131	56	8	592	15	6
Lane Group Flow (vph)	0	10	0	0	175	16	0	213	9	673	0	23
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm		Perm	Perm
Protected Phases		9			2			6		4		
Permitted Phases	9		2	2		2	6		4		8	8
Detector Phases	9	9	2	2	2	2	6	6	4	4	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	22.0	22.0	26.0	26.0	26.0	26.0	26.0	26.0	42.0	42.0	42.0	42.0
Total Split (%)	24.4%	24.4%	28.9%	28.9%	28.9%	28.9%	28.9%	28.9%	46.7%	46.7%	46.7%	46.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio		0.07			0.27	0.02		0.42	0.11	0.85		0.24
Control Delay		31.4			18.0	8.3		20.9	19.8	35.9		25.1
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay		31.4			18.0	8.3		20.9	19.8	35.9		25.1
Queue Length 50th (m)		1.0			16.9	0.0		22.1	0.9	102.0		2.5
Queue Length 95th (m)		5.7			39.7	4.1		52.2	4.3	#165.3		9.1
Internal Link Dist (m)		68.1			4538.6			763.0		331.6		
Turn Bay Length (m)												
Base Capacity (vph)		328			639	745		510	84	790		94
Starvation Cap Reductn		0			0	0		0	0	0		0
Spillback Cap Reductn		0			0	0		0	0	0		0
Storage Cap Reductn		0			0	0		0	0	0		0
Reduced v/c Ratio		0.03			0.27	0.02		0.42	0.11	0.85		0.24

## Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

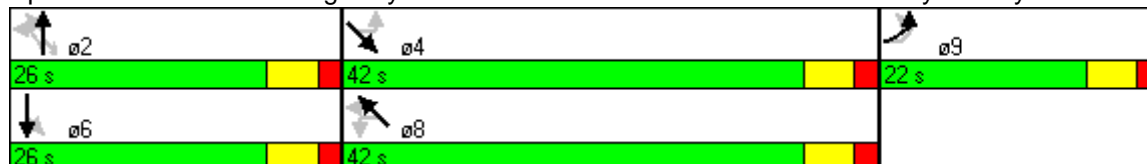
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Highway 26-McKibbon Drive &amp; St Vincent Street-Grey County 7



## 1: Highway 26-McKibbin Drive &amp; St Vincent Street-Grey County 7



















Lane Group	NWT
Lane Configurations	P
Volume (vph)	720
Lane Group Flow (vph)	812
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	8
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	42.0
Total Split (%)	46.7%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	1.02
Control Delay	65.7
Queue Delay	0.0
Total Delay	65.7
Queue Length 50th (m)	~150.8
Queue Length 95th (m)	#219.6
Internal Link Dist (m)	393.4
Turn Bay Length (m)	
Base Capacity (vph)	793
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	1.02
Intersection Summary	

# HCM Signalized Intersection Capacity Analysis

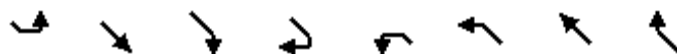
## 1: Highway 26-McKibbin Drive & St Vincent Street-Grey County 7

Future (2028) Total PM  
Optimized

												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SBR2
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0		4.0		
Lane Util. Factor		1.00					1.00	1.00		1.00		
Frt		0.89					1.00	0.85		0.99		
Flt Protected		0.99					0.97	1.00		0.97		
Satd. Flow (prot)		1663					1830	1601		1811		
Flt Permitted		0.92					0.74	1.00		0.66		
Satd. Flow (perm)		1553					1384	1601		1235		
Volume (vph)	1	1	4	4	2	92	67	15	131	56	3	6
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	4	4	2	100	73	16	142	61	3	7
RTOR Reduction (vph)	0	4	0	0	0	0	0	9	0	1	0	0
Lane Group Flow (vph)	0	6	0	0	0	0	175	7	0	212	0	0
Turn Type	Perm				Perm		Perm	Perm		Perm		
Protected Phases	9						2			6		
Permitted Phases	9				2		2	2		6		
Actuated Green, G (s)	1.5						47.0	47.0		47.0		
Effective Green, g (s)	3.5						49.0	49.0		49.0		
Actuated g/C Ratio	0.03						0.41	0.41		0.41		
Clearance Time (s)	6.0						6.0	6.0		6.0		
Vehicle Extension (s)	3.0						3.0	3.0		3.0		
Lane Grp Cap (vph)	45						565	654		504		
v/s Ratio Prot												
v/s Ratio Perm	c0.00						0.13	0.00		c0.17		
v/c Ratio	0.14						0.31	0.01		0.42		
Uniform Delay, d1	56.8						24.0	21.1		25.4		
Progression Factor	1.00						1.00	1.00		1.00		
Incremental Delay, d2	1.4						1.4	0.0		2.6		
Delay (s)	58.2						25.5	21.1		27.9		
Level of Service	E						C	C		C		
Approach Delay (s)	58.2						25.1			27.9		
Approach LOS	E						C			C		
Intersection Summary												
HCM Average Control Delay	36.9				HCM Level of Service				D			
HCM Volume to Capacity ratio	0.67											
Actuated Cycle Length (s)	120.0				Sum of lost time (s)				12.0			
Intersection Capacity Utilization	70.2%				ICU Level of Service				C			
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
 1: Highway 26-McKibbin Drive & St Vincent Street-Grey County 7

Future (2028) Total PM  
 Optimized



Movement	SEL	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations								
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	1.00				1.00	1.00	
Frt	1.00	0.99				1.00	0.99	
Flt Protected	0.95	1.00				0.95	1.00	
Satd. Flow (prot)	1789	1871				1789	1873	
Flt Permitted	0.07	1.00				0.15	1.00	
Satd. Flow (perm)	136	1871				291	1873	
Volume (vph)	8	592	21	6	15	6	718	27
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	643	23	7	16	7	780	29
RTOR Reduction (vph)	0	1	0	0	0	0	1	0
Lane Group Flow (vph)	9	672	0	0	0	23	808	0
Turn Type	Perm					Perm	Perm	
Protected Phases		4					8	
Permitted Phases	4					8	8	
Actuated Green, G (s)	53.5	53.5				53.5	53.5	
Effective Green, g (s)	55.5	55.5				55.5	55.5	
Actuated g/C Ratio	0.46	0.46				0.46	0.46	
Clearance Time (s)	6.0	6.0				6.0	6.0	
Vehicle Extension (s)	3.0	3.0				3.0	3.0	
Lane Grp Cap (vph)	63	865				135	866	
v/s Ratio Prot		0.36					c0.43	
v/s Ratio Perm	0.07					0.08		
v/c Ratio	0.14	0.78				0.17	0.93	
Uniform Delay, d1	18.6	27.1				18.8	30.5	
Progression Factor	1.00	1.00				1.00	1.00	
Incremental Delay, d2	1.0	4.4				0.6	16.6	
Delay (s)	19.6	31.5				19.4	47.1	
Level of Service	B	C				B	D	
Approach Delay (s)		31.3					46.3	
Approach LOS		C					D	

Intersection Summary

## Queues

Future (2028) Total PM

## 1: Highway 26-McKibbon Drive &amp; St Vincent Street-Grey County 7

Optimized



Lane Group	EBL2	EBL	NBL2	NBL	NBT	NBR	SBL	SBT	SEL	SET	NWL2	NWL
Lane Configurations												
Volume (vph)	1	1	2	92	67	15	131	56	8	592	15	6
Lane Group Flow (vph)	0	10	0	0	175	16	0	213	9	673	0	23
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm		Perm	Perm
Protected Phases		9			2			6		4		
Permitted Phases	9		2	2		2	6		4		8	8
Detector Phases	9	9	2	2	2	2	6	6	4	4	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	22.0	22.0	35.0	35.0	35.0	35.0	35.0	35.0	63.0	63.0	63.0	63.0
Total Split (%)	18.3%	18.3%	29.2%	29.2%	29.2%	29.2%	29.2%	29.2%	52.5%	52.5%	52.5%	52.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio		0.09			0.28	0.02		0.44	0.13	0.78		0.14
Control Delay		42.8			25.0	10.9		29.2	22.0	33.8		19.7
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay		42.8			25.0	10.9		29.2	22.0	33.8		19.7
Queue Length 50th (m)		1.4			25.8	0.0		34.1	1.1	122.0		2.9
Queue Length 95th (m)		6.8			51.5	5.0		68.4	4.7	167.9		8.3
Internal Link Dist (m)		68.1			4538.6			763.0		331.6		
Turn Bay Length (m)												
Base Capacity (vph)		247			622	727		480	75	920		171
Starvation Cap Reductn		0			0	0		0	0	0		0
Spillback Cap Reductn		0			0	0		0	0	0		0
Storage Cap Reductn		0			0	0		0	0	0		0
Reduced v/c Ratio		0.04			0.28	0.02		0.44	0.12	0.73		0.13

## Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

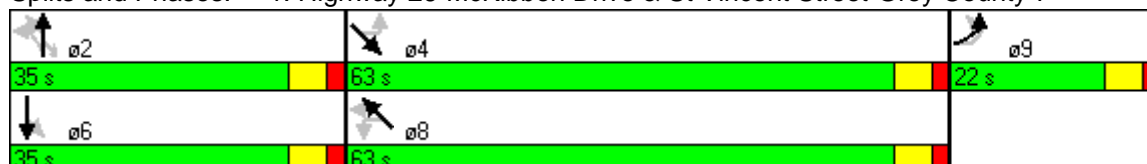
Natural Cycle: 90

Control Type: Actuated-Coordinated

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Highway 26-McKibbon Drive &amp; St Vincent Street-Grey County 7




## Queues

1: Highway 26-McKibbin Drive &amp; St Vincent Street-Grey County 7

Future (2028) Total PM

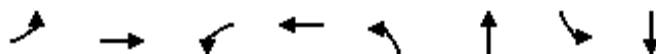
Optimized



Lane Group	NWT
Lane Configurations	P
Volume (vph)	718
Lane Group Flow (vph)	809
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	8
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	63.0
Total Split (%)	52.5%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	0.93
Control Delay	48.5
Queue Delay	0.0
Total Delay	48.5
Queue Length 50th (m)	165.0
Queue Length 95th (m)	244.0
Internal Link Dist (m)	393.4
Turn Bay Length (m)	
Base Capacity (vph)	922
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.88
Intersection Summary	



## 2: Highway 26 &amp; Garden Centre Access-3rd Line



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↰	↱	↰	↱	↰	↱	↰	↱
Volume (vph)	1	436	187	518	89	0	1	0
Lane Group Flow (vph)	1	570	203	564	97	182	0	1
Turn Type	Perm		pm+pt		Perm		Perm	
Protected Phases		4	3	8		2		6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	3	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	10.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	45.0	45.0	19.0	64.0	26.0	26.0	26.0	26.0
Total Split (%)	50.0%	50.0%	21.1%	71.1%	28.9%	28.9%	28.9%	28.9%
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
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Max	Max	Max	Max
v/c Ratio	0.00	0.79	0.45	0.51	0.23	0.22		0.00
Control Delay	13.0	28.4	9.8	10.2	25.3	0.6		24.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	13.0	28.4	9.8	10.2	25.3	0.6		24.0
Queue Length 50th (m)	0.1	66.5	11.7	40.9	10.3	0.0		0.1
Queue Length 95th (m)	0.9	107.0	19.5	60.6	26.6	0.0		1.3
Internal Link Dist (m)		82.1		668.4		114.4		99.1
Turn Bay Length (m)	15.0		30.0					
Base Capacity (vph)	405	881	501	1255	427	819		303
Starvation Cap Reductn	0	0	0	0	0	0		0
Spillback Cap Reductn	0	0	0	0	0	0		0
Storage Cap Reductn	0	0	0	0	0	0		0
Reduced v/c Ratio	0.00	0.65	0.41	0.45	0.23	0.22		0.00

## Intersection Summary

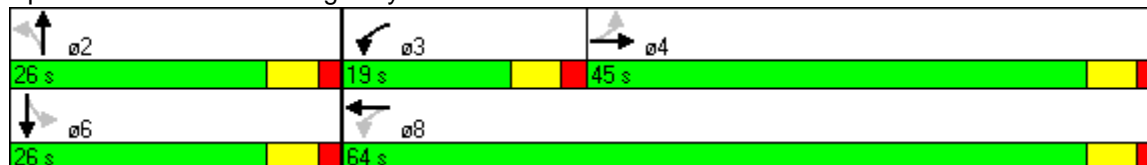
Cycle Length: 90

Actuated Cycle Length: 74.8

Natural Cycle: 60

Control Type: Semi Act-Uncoord




















Splits and Phases: 2: Highway 26 &amp; Garden Centre Access-3rd Line



## HCM Signalized Intersection Capacity Analysis










### 2: Highway 26 & Garden Centre Access-3rd Line

Future (2028) Total PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.97		1.00	1.00		1.00	0.85			1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.95	
Satd. Flow (prot)	1789	1836		1789	1883		1789	1601			1789	
Flt Permitted	0.45	1.00		0.16	1.00		0.76	1.00			0.59	
Satd. Flow (perm)	852	1836		305	1883		1426	1601			1109	
Volume (vph)	1	436	88	187	518	1	89	0	167	1	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	474	96	203	563	1	97	0	182	1	0	0
RTOR Reduction (vph)	0	9	0	0	0	0	0	127	0	0	0	0
Lane Group Flow (vph)	1	561	0	203	564	0	97	55	0	0	1	0
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	27.0	27.0		42.2	42.2		20.4	20.4			20.4	
Effective Green, g (s)	29.0	29.0		44.2	44.2		22.4	22.4			22.4	
Actuated g/C Ratio	0.39	0.39		0.59	0.59		0.30	0.30			0.30	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	331	714		404	1116		428	481			333	
v/s Ratio Prot		c0.31		0.08	c0.30			0.03				
v/s Ratio Perm	0.00			0.22			c0.07				0.00	
v/c Ratio	0.00	0.79		0.50	0.51		0.23	0.11			0.00	
Uniform Delay, d1	14.0	20.1		10.9	8.8		19.6	18.9			18.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	5.7		1.0	0.4		1.2	0.5			0.0	
Delay (s)	14.0	25.7		11.9	9.2		20.8	19.4			18.3	
Level of Service	B	C		B	A		C	B			B	
Approach Delay (s)		25.7			9.9			19.9			18.3	
Approach LOS		C			A			B			B	
<b>Intersection Summary</b>												
HCM Average Control Delay			17.2			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			74.6			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			59.0%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

















# HCM Unsignalized Intersection Capacity Analysis 3: Sideroad 7 & 3rd Line

Future (2028) Total PM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	62	2	0	14	21	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	67	2	0	15	23	63
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	70	54	86			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	70	54	86			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	100	100			
cM capacity (veh/h)	935	1013	1510			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	70	15	86			
Volume Left	67	0	0			
Volume Right	2	0	63			
cSH	937	1510	1700			
Volume to Capacity	0.07	0.00	0.05			
Queue Length 95th (m)	1.8	0.0	0.0			
Control Delay (s)	9.1	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	9.1	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		3.7				
Intersection Capacity Utilization		14.9%		ICU Level of Service		A
Analysis Period (min)		15				



















# HCM Unsignalized Intersection Capacity Analysis 4: Sideroad 7 & Grey County 7

Future (2028) Total PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	7	0	29	9	21	3	45	33	21	47	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	8	0	32	10	23	3	49	36	23	51	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	200	190	53	176	174	67	55			85		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	200	190	53	176	174	67	55			85		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	100	96	99	98	100			98		
cM capacity (veh/h)	724	693	1014	770	707	997	1549			1512		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	11	64	88	78								
Volume Left	3	32	3	23								
Volume Right	0	23	36	4								
cSH	702	825	1549	1512								
Volume to Capacity	0.02	0.08	0.00	0.02								
Queue Length 95th (m)	0.4	1.9	0.0	0.3								
Control Delay (s)	10.2	9.7	0.3	2.2								
Lane LOS	B	A	A	A								
Approach Delay (s)	10.2	9.7	0.3	2.2								
Approach LOS	B	A										
Intersection Summary												
Average Delay			3.9									
Intersection Capacity Utilization		22.8%		ICU Level of Service		A						
Analysis Period (min)		15										










# HCM Unsignalized Intersection Capacity Analysis 5: Sideroad 10 & Site Access 2 & 3rd Line

Future (2028) Total PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	27	0	89	0	91	28	101	87	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	29	0	97	0	99	30	110	95	2
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	511	445	96	428	430	114	97			129		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	511	445	96	428	430	114	97			129		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	94	100	90	100			92		
cM capacity (veh/h)	400	470	961	506	478	938	1497			1456		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	0	126	0	129	110	97						
Volume Left	0	29	0	0	110	0						
Volume Right	0	97	0	30	0	2						
cSH	1700	783	1700	1700	1456	1700						
Volume to Capacity	0.00	0.16	0.00	0.08	0.08	0.06						
Queue Length 95th (m)	0.0	4.3	0.0	0.0	1.9	0.0						
Control Delay (s)	0.0	10.5	0.0	0.0	7.7	0.0						
Lane LOS	A	B			A							
Approach Delay (s)	0.0	10.5	0.0		4.1							
Approach LOS	A	B										
Intersection Summary												
Average Delay			4.7									
Intersection Capacity Utilization		25.9%		ICU Level of Service		A						
Analysis Period (min)		15										











# HCM Unsignalized Intersection Capacity Analysis 6: Site Access 3 & 3rd Line

Future (2028) Total PM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	15	51	61	15	57	57
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	55	66	16	62	62
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	260	74			83	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	260	74			83	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	94			96	
cM capacity (veh/h)	699	987			1515	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	72	83	124			
Volume Left	16	0	62			
Volume Right	55	16	0			
cSH	902	1700	1515			
Volume to Capacity	0.08	0.05	0.04			
Queue Length 95th (m)	2.0	0.0	1.0			
Control Delay (s)	9.3	0.0	3.9			
Lane LOS	A		A			
Approach Delay (s)	9.3	0.0	3.9			
Approach LOS	A					
Intersection Summary						
Average Delay		4.1				
Intersection Capacity Utilization		23.5%		ICU Level of Service		A
Analysis Period (min)		15				

# HCM Unsignalized Intersection Capacity Analysis 7: Site Acces 2 & 3rd Line


















Future (2028) Total PM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free		Free	Free
Grade	0%		0%			0%
Volume (veh/h)	25	83	153	27	95	165
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	90	166	29	103	179
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	567	181			196	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	567	181			196	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	90			93	
cM capacity (veh/h)	449	862			1377	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	117	196	103	179		
Volume Left	27	0	103	0		
Volume Right	90	29	0	0		
cSH	710	1700	1377	1700		
Volume to Capacity	0.17	0.12	0.07	0.11		
Queue Length 95th (m)	4.5	0.0	1.8	0.0		
Control Delay (s)	11.1	0.0	7.8	0.0		
Lane LOS	B		A			
Approach Delay (s)	11.1	0.0	2.9			
Approach LOS	B					
Intersection Summary						
Average Delay		3.5				
Intersection Capacity Utilization		31.5%		ICU Level of Service		A
Analysis Period (min)		15				

# HCM Signalized Intersection Capacity Analysis

Future (2028) Total SAT

## 1: Highway 26-McKibbin Drive & St Vincent Street-Grey County 7

												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SEL
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0		4.0		4.0
Lane Util. Factor		1.00					1.00	1.00		1.00		1.00
Frt		0.88					1.00	0.85		1.00		1.00
Flt Protected		0.99					0.96	1.00		0.97		0.95
Satd. Flow (prot)		1654					1814	1601		1829		1789
Flt Permitted		0.95					0.72	1.00		0.79		0.18
Satd. Flow (perm)		1579					1347	1601		1482		336
Volume (vph)	1	1	5	6	2	109	33	8	71	54	2	4
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	5	7	2	118	36	9	77	59	2	4
RTOR Reduction (vph)	0	7	0	0	0	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	7	0	0	0	0	156	5	0	138	0	4
Turn Type	Perm				Perm	Perm		Perm	Perm			Perm
Protected Phases		9					2			6		
Permitted Phases	9				2	2		2	6			4
Actuated Green, G (s)		1.4					46.6	46.6		46.6		24.0
Effective Green, g (s)		3.4					48.6	48.6		48.6		26.0
Actuated g/C Ratio		0.04					0.54	0.54		0.54		0.29
Clearance Time (s)		6.0					6.0	6.0		6.0		6.0
Vehicle Extension (s)		3.0					3.0	3.0		3.0		3.0
Lane Grp Cap (vph)		60					727	865		800		97
v/s Ratio Prot												
v/s Ratio Perm		c0.00					c0.12	0.00		0.09		0.01
v/c Ratio		0.12					0.21	0.01		0.17		0.04
Uniform Delay, d1		41.9					10.8	9.6		10.5		23.0
Progression Factor		1.00					1.00	1.00		1.00		1.00
Incremental Delay, d2		0.9					0.7	0.0		0.5		0.2
Delay (s)		42.8					11.4	9.6		11.0		23.2
Level of Service		D					B	A		B		C
Approach Delay (s)		42.8					11.3			11.0		
Approach LOS		D					B			B		
<b>Intersection Summary</b>												
HCM Average Control Delay		54.7					HCM Level of Service			D		
HCM Volume to Capacity ratio		0.50										
Actuated Cycle Length (s)		90.0					Sum of lost time (s)			12.0		
Intersection Capacity Utilization		55.1%					ICU Level of Service			B		
Analysis Period (min)		15										
c Critical Lane Group												



HCM Signalized Intersection Capacity Analysis  
1: Highway 26-McKibbin Drive & St Vincent Street-Grey County 7

Future (2028) Total SAT






















Movement	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations	PT				PT	PT	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0				4.0	4.0	
Lane Util. Factor	1.00				1.00	1.00	
Frt	0.98				1.00	0.99	
Flt Protected	1.00				0.95	1.00	
Satd. Flow (prot)	1854				1789	1866	
Flt Permitted	1.00				0.15	1.00	
Satd. Flow (perm)	1854				290	1866	
Volume (vph)	472	51	5	1	5	382	25
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	513	55	5	1	5	415	27
RTOR Reduction (vph)	0	0	0	0	0	3	0
Lane Group Flow (vph)	573	0	0	0	6	439	0
Turn Type				Perm	Perm		
Protected Phases	4					8	
Permitted Phases				8	8		
Actuated Green, G (s)	24.0				24.0	24.0	
Effective Green, g (s)	26.0				26.0	26.0	
Actuated g/C Ratio	0.29				0.29	0.29	
Clearance Time (s)	6.0				6.0	6.0	
Vehicle Extension (s)	3.0				3.0	3.0	
Lane Grp Cap (vph)	536				84	539	
v/s Ratio Prot	0.31					0.24	
v/s Ratio Perm					0.02		
v/c Ratio	1.07				0.07	0.81	
Uniform Delay, d1	32.0				23.2	29.8	
Progression Factor	1.00				1.00	1.00	
Incremental Delay, d2	58.6				0.4	9.2	
Delay (s)	90.6				23.6	39.0	
Level of Service	F				C	D	
Approach Delay (s)	90.2					38.8	
Approach LOS	F					D	

Intersection Summary

## Queues

Future (2028) Total SAT

## 1: Highway 26-McKibbin Drive &amp; St Vincent Street-Grey County 7

												
Lane Group	EBL2	EBL	NBL2	NBL	NBT	NBR	SBL	SBT	SEL	SET	NWL2	NWL
Lane Configurations												
Volume (vph)	1	1	2	109	33	8	71	54	4	472	1	5
Lane Group Flow (vph)	0	14	0	0	156	9	0	138	4	573	0	6
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm		Perm	Perm
Protected Phases		9			2			6		4		
Permitted Phases	9		2	2		2	6		4		8	8
Detector Phases	9	9	2	2	2	2	6	6	4	4	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio		0.09			0.20	0.01		0.16	0.04	1.07		0.07
Control Delay		28.5			10.5	6.0		10.1	24.8	92.1		26.0
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay		28.5			10.5	6.0		10.1	24.8	92.1		26.0
Queue Length 50th (m)		1.1			10.5	0.0		9.0	0.5	~110.9		0.8
Queue Length 95th (m)		6.6			27.9	2.4		24.3	3.0	#171.6		3.8
Internal Link Dist (m)		68.1			4538.6			763.0		331.6		
Turn Bay Length (m)												
Base Capacity (vph)		477			777	953		856	97	535		84
Starvation Cap Reductn		0			0	0		0	0	0		0
Spillback Cap Reductn		0			0	0		0	0	0		0
Storage Cap Reductn		0			0	0		0	0	0		0
Reduced v/c Ratio		0.03			0.20	0.01		0.16	0.04	1.07		0.07

## Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

~ 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.

Splits and Phases: 1: Highway 26-McKibbin Drive &amp; St Vincent Street-Grey County 7



## 1: Highway 26-McKibbin Drive &amp; St Vincent Street-Grey County 7




















Lane Group	NWT
Lane Configurations	P
Volume (vph)	382
Lane Group Flow (vph)	442
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	8
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	30.0
Total Split (%)	33.3%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	0.82
Control Delay	43.4
Queue Delay	0.0
Total Delay	43.4
Queue Length 50th (m)	70.2
Queue Length 95th (m)	117.6
Internal Link Dist (m)	393.4
Turn Bay Length (m)	
Base Capacity (vph)	542
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.82
Intersection Summary	

# HCM Signalized Intersection Capacity Analysis

## 1: Highway 26-McKibbin Drive & St Vincent Street-Grey County 7

Future (2028) Total SAT  
Optimized

												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SEL
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0		4.0		4.0
Lane Util. Factor		1.00					1.00	1.00		1.00		1.00
Frt		0.88					1.00	0.85		1.00		1.00
Flt Protected		0.99					0.96	1.00		0.97		0.95
Satd. Flow (prot)		1654					1814	1601		1829		1789
Flt Permitted		0.95					0.71	1.00		0.78		0.25
Satd. Flow (perm)		1579					1328	1601		1462		470
Volume (vph)	1	1	5	6	2	109	33	8	71	54	2	4
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	5	7	2	118	36	9	77	59	2	4
RTOR Reduction (vph)	0	7	0	0	0	0	0	4	0	0	0	0
Lane Group Flow (vph)	0	7	0	0	0	0	156	5	0	138	0	4
Turn Type	Perm				Perm	Perm		Perm	Perm			Perm
Protected Phases		9					2			6		
Permitted Phases	9				2	2		2	6			4
Actuated Green, G (s)		2.9					59.0	59.0		59.0		40.1
Effective Green, g (s)		4.9					61.0	61.0		61.0		42.1
Actuated g/C Ratio		0.04					0.51	0.51		0.51		0.35
Clearance Time (s)		6.0					6.0	6.0		6.0		6.0
Vehicle Extension (s)		3.0					3.0	3.0		3.0		3.0
Lane Grp Cap (vph)		64					675	814		743		165
v/s Ratio Prot												
v/s Ratio Perm		c0.00					c0.12	0.00		0.09		0.01
v/c Ratio		0.11					0.23	0.01		0.19		0.02
Uniform Delay, d1		55.5					16.4	14.5		16.0		25.5
Progression Factor		1.00					1.00	1.00		1.00		1.00
Incremental Delay, d2		0.8					0.8	0.0		0.6		0.1
Delay (s)		56.3					17.2	14.6		16.6		25.6
Level of Service		E					B	B		B		C
Approach Delay (s)		56.3					17.1			16.6		
Approach LOS		E					B			B		
<b>Intersection Summary</b>												
HCM Average Control Delay		37.3					HCM Level of Service			D		
HCM Volume to Capacity ratio		0.48										
Actuated Cycle Length (s)		120.0					Sum of lost time (s)			12.0		
Intersection Capacity Utilization		54.9%					ICU Level of Service			A		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
 1: Highway 26-McKibbin Drive & St Vincent Street-Grey County 7

Future (2028) Total SAT  
 Optimized



Movement	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations	PT				PT	PT	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0				4.0	4.0	
Lane Util. Factor	1.00				1.00	1.00	
Frt	0.98				1.00	0.99	
Flt Protected	1.00				0.95	1.00	
Satd. Flow (prot)	1854				1789	1866	
Flt Permitted	1.00				0.11	1.00	
Satd. Flow (perm)	1854				203	1866	
Volume (vph)	469	50	5	1	5	382	25
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	510	54	5	1	5	415	27
RTOR Reduction (vph)	0	0	0	0	0	3	0
Lane Group Flow (vph)	569	0	0	0	6	439	0
Turn Type				Perm	Perm		
Protected Phases	4					8	
Permitted Phases				8	8		
Actuated Green, G (s)	40.1				40.1	40.1	
Effective Green, g (s)	42.1				42.1	42.1	
Actuated g/C Ratio	0.35				0.35	0.35	
Clearance Time (s)	6.0				6.0	6.0	
Vehicle Extension (s)	3.0				3.0	3.0	
Lane Grp Cap (vph)	650				71	655	
v/s Ratio Prot	0.31					0.24	
v/s Ratio Perm					0.03		
v/c Ratio	0.88				0.08	0.67	
Uniform Delay, d1	36.5				26.1	33.1	
Progression Factor	1.00				1.00	1.00	
Incremental Delay, d2	12.6				0.5	2.7	
Delay (s)	49.1				26.6	35.8	
Level of Service	D				C	D	
Approach Delay (s)	48.9					35.7	
Approach LOS	D					D	

Intersection Summary

## Queues

Future (2028) Total SAT

1: Highway 26-McKibbon Drive &amp; St Vincent Street-Grey County 7

Optimized



Lane Group	EBL2	EBL	NBL2	NBL	NBT	NBR	SBL	SBT	SEL	SET	NWL2	NWL
Lane Configurations												
Volume (vph)	1	1	2	109	33	8	71	54	4	469	1	5
Lane Group Flow (vph)	0	14	0	0	156	9	0	138	4	569	0	6
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm		Perm	Perm
Protected Phases		9			2			6		4		
Permitted Phases	9		2	2		2	6		4		8	8
Detector Phases	9	9	2	2	2	2	6	6	4	4	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	27.0	27.0	33.0	33.0	33.0	33.0	33.0	33.0	60.0	60.0	60.0	60.0
Total Split (%)	22.5%	22.5%	27.5%	27.5%	27.5%	27.5%	27.5%	27.5%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio		0.12			0.23	0.01		0.20	0.02	0.88		0.04
Control Delay		38.8			19.9	11.9		19.5	21.0	50.9		21.7
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay		38.8			19.9	11.9		19.5	21.0	50.9		21.7
Queue Length 50th (m)		1.6			16.5	0.0		14.3	0.6	125.2		0.9
Queue Length 95th (m)		8.1			43.7	3.4		38.9	2.6	145.4		3.4
Internal Link Dist (m)		68.1			4538.6			763.0		331.6		
Turn Bay Length (m)												
Base Capacity (vph)		318			686	866		690	311	865		215
Starvation Cap Reductn		0			0	0		0	0	0		0
Spillback Cap Reductn		0			0	0		0	0	0		0
Storage Cap Reductn		0			0	0		0	0	0		0
Reduced v/c Ratio		0.04			0.23	0.01		0.20	0.01	0.66		0.03

## Intersection Summary

Cycle Length: 120

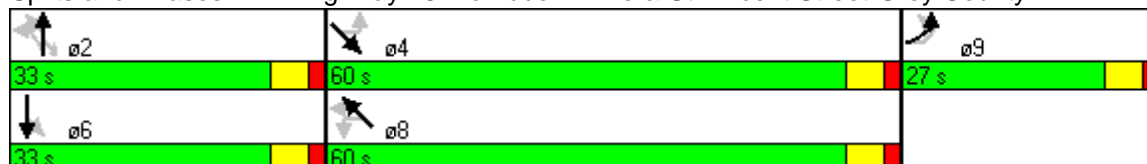
Actuated Cycle Length: 120


Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

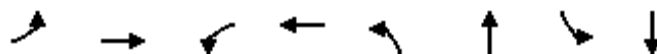
Splits and Phases: 1: Highway 26-McKibbon Drive &amp; St Vincent Street-Grey County 7





Lane Group	NWT
Lane Configurations	8
Volume (vph)	382
Lane Group Flow (vph)	442
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	8
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	60.0
Total Split (%)	50.0%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	0.67
Control Delay	37.2
Queue Delay	0.0
Total Delay	37.2
Queue Length 50th (m)	87.5
Queue Length 95th (m)	103.4
Internal Link Dist (m)	393.4
Turn Bay Length (m)	
Base Capacity (vph)	873
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.51
Intersection Summary	

## 2: Highway 26 &amp; Garden Centre Access-3rd Line



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	4	418	169	427	103	0	1	0
Lane Group Flow (vph)	4	626	184	464	112	249	0	5
Turn Type	Perm		pm+pt		pm+pt		Perm	
Protected Phases		4	3	8	5	2		6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	3	8	5	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	10.0	22.0	10.0	22.0	22.0	22.0
Total Split (s)	44.0	44.0	11.0	55.0	11.0	35.0	24.0	24.0
Total Split (%)	48.9%	48.9%	12.2%	61.1%	12.2%	38.9%	26.7%	26.7%
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
Lead/Lag	Lag	Lag	Lead		Lead		Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	Max
v/c Ratio	0.01	0.85	0.63	0.46	0.21	0.30		0.01
Control Delay	14.2	34.0	20.2	13.7	20.8	0.9		19.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	14.2	34.0	20.2	13.7	20.8	0.9		19.2
Queue Length 50th (m)	0.4	84.7	14.3	43.0	12.4	0.0		0.1
Queue Length 95th (m)	2.2	127.5	24.5	64.2	25.2	0.0		2.9
Internal Link Dist (m)		82.1		668.4		114.4		99.1
Turn Bay Length (m)	15.0		30.0					
Base Capacity (vph)	415	818	292	1067	527	838		436
Starvation Cap Reductn	0	0	0	0	0	0		0
Spillback Cap Reductn	0	0	0	0	0	0		0
Storage Cap Reductn	0	0	0	0	0	0		0
Reduced v/c Ratio	0.01	0.77	0.63	0.43	0.21	0.30		0.01

## Intersection Summary

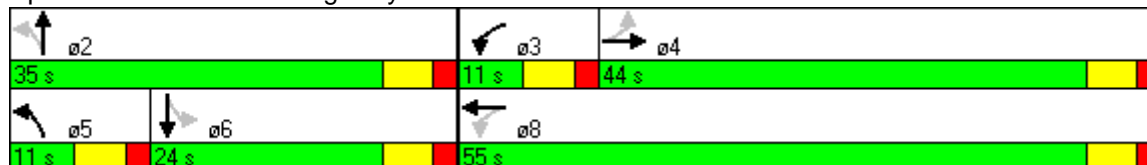
Cycle Length: 90

Actuated Cycle Length: 83.6

Natural Cycle: 75

Control Type: Semi Act-Uncoord

Splits and Phases: 2: Highway 26 &amp; Garden Centre Access-3rd Line
























## HCM Signalized Intersection Capacity Analysis

### 2: Highway 26 & Garden Centre Access-3rd Line










Future (2028) Total SAT

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.96		1.00	1.00		1.00	0.85			0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1789	1806		1789	1883		1789	1601			1663	
Flt Permitted	0.50	1.00		0.11	1.00		0.72	1.00			0.95	
Satd. Flow (perm)	935	1806		211	1883		1365	1601			1603	
Volume (vph)	4	418	158	169	427	0	103	0	229	1	0	4
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	454	172	184	464	0	112	0	249	1	0	4
RTOR Reduction (vph)	0	16	0	0	0	0	0	153	0	0	3	0
Lane Group Flow (vph)	4	610	0	184	464	0	112	96	0	0	2	0
Turn Type	Perm			pm+pt			pm+pt			Perm		
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	31.3	31.3		42.3	42.3		30.6	30.6			20.7	
Effective Green, g (s)	33.3	33.3		44.3	44.3		32.6	32.6			22.7	
Actuated g/C Ratio	0.39	0.39		0.52	0.52		0.38	0.38			0.27	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	367	708		240	983		554	615			429	
v/s Ratio Prot		c0.34		c0.06	0.25		c0.01	0.06				
v/s Ratio Perm	0.00			0.34			c0.06				0.00	
v/c Ratio	0.01	0.86		0.77	0.47		0.20	0.16			0.00	
Uniform Delay, d1	15.7	23.7		16.6	12.9		17.3	17.1			22.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	10.5		13.6	0.4		0.2	0.5			0.0	
Delay (s)	15.8	34.1		30.2	13.2		17.5	17.7			22.8	
Level of Service	B	C		C	B		B	B			C	
Approach Delay (s)		34.0			18.1			17.6			22.8	
Approach LOS		C			B			B			C	
<b>Intersection Summary</b>												
HCM Average Control Delay			24.1			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			84.9			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			65.2%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Unsignalized Intersection Capacity Analysis

















## 3: Sideroad 7 & 3rd Line

Future (2028) Total SAT

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	100	5	0	20	31	91
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	109	5	0	22	34	99
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	105	83	133			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	105	83	133			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	99	100			
cM capacity (veh/h)	893	976	1452			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	114	22	133			
Volume Left	109	0	0			
Volume Right	5	0	99			
cSH	897	1452	1700			
Volume to Capacity	0.13	0.00	0.08			
Queue Length 95th (m)	3.3	0.0	0.0			
Control Delay (s)	9.6	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	9.6	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		4.1				
Intersection Capacity Utilization		19.7%		ICU Level of Service	A	
Analysis Period (min)		15				



















# HCM Unsignalized Intersection Capacity Analysis 4: Sideroad 7 & Grey County 7

Future (2028) Total SAT

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	6	13	3	51	15	27	6	90	33	48	78	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	14	3	55	16	29	7	98	36	52	85	10
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	360	341	90	333	328	116	95			134		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	360	341	90	333	328	116	95			134		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	97	100	91	97	97	100			96		
cM capacity (veh/h)	547	558	968	588	567	937	1499			1451		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	24	101	140	147								
Volume Left	7	55	7	52								
Volume Right	3	29	36	10								
cSH	589	655	1499	1451								
Volume to Capacity	0.04	0.15	0.00	0.04								
Queue Length 95th (m)	1.0	4.1	0.1	0.8								
Control Delay (s)	11.4	11.5	0.4	2.9								
Lane LOS	B	B	A	A								
Approach Delay (s)	11.4	11.5	0.4	2.9								
Approach LOS	B	B										
Intersection Summary												
Average Delay			4.6									
Intersection Capacity Utilization		34.3%		ICU Level of Service		A						
Analysis Period (min)		15										










# HCM Unsignalized Intersection Capacity Analysis 5: Sideroad 10 & Site Access 2 & 3rd Line

Future (2028) Total SAT

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	46	0	125	5	115	45	132	129	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	50	0	136	5	125	49	143	140	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	701	614	142	588	592	149	145			174		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	701	614	142	588	592	149	145			174		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	87	100	85	100			90		
cM capacity (veh/h)	276	364	905	387	375	897	1438			1403		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	0	186	5	174	143	145						
Volume Left	0	50	5	0	143	0						
Volume Right	0	136	0	49	0	4						
cSH	1700	662	1438	1700	1403	1700						
Volume to Capacity	0.00	0.28	0.00	0.10	0.10	0.09						
Queue Length 95th (m)	0.0	8.7	0.1	0.0	2.6	0.0						
Control Delay (s)	0.0	12.5	7.5	0.0	7.9	0.0						
Lane LOS	A	B	A		A							
Approach Delay (s)	0.0	12.5	0.2		3.9							
Approach LOS	A	B										
Intersection Summary												
Average Delay			5.4									
Intersection Capacity Utilization			36.4%		ICU Level of Service					A		
Analysis Period (min)			15									











# HCM Unsignalized Intersection Capacity Analysis 6: Site Access 3 & 3rd Line

Future (2028) Total SAT

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	24	68	97	23	70	105
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	74	105	25	76	114
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	384	118			130	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	384	118			130	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	92			95	
cM capacity (veh/h)	586	934			1455	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	100	130	190			
Volume Left	26	0	76			
Volume Right	74	25	0			
cSH	809	1700	1455			
Volume to Capacity	0.12	0.08	0.05			
Queue Length 95th (m)	3.2	0.0	1.3			
Control Delay (s)	10.1	0.0	3.3			
Lane LOS	B		A			
Approach Delay (s)	10.1	0.0	3.3			
Approach LOS	B					
<b>Intersection Summary</b>						
Average Delay		3.9				
Intersection Capacity Utilization		28.2%		ICU Level of Service		A
Analysis Period (min)		15				

# HCM Unsignalized Intersection Capacity Analysis 7: Site Access 2 & 3rd Line

Future (2028) Total SAT




















						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free		Free	Free
Grade	0%		0%			0%
Volume (veh/h)	41	107	204	36	102	224
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	45	116	222	39	111	243
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	707	241			261	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	707	241			261	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	88	85			91	
cM capacity (veh/h)	368	798			1304	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	161	261	111	243		
Volume Left	45	0	111	0		
Volume Right	116	39	0	0		
cSH	602	1700	1304	1700		
Volume to Capacity	0.27	0.15	0.09	0.14		
Queue Length 95th (m)	8.1	0.0	2.1	0.0		
Control Delay (s)	13.1	0.0	8.0	0.0		
Lane LOS	B		A			
Approach Delay (s)	13.1	0.0	2.5			
Approach LOS	B					
Intersection Summary						
Average Delay		3.9				
Intersection Capacity Utilization		37.4%		ICU Level of Service		A
Analysis Period (min)		15				

**APPENDIX J**  
**Future (2033) Total Traffic Conditions**  
**Analysis Outputs**  
Level of Service Calculations

## Queues

Future (2033) Total AM

## 1: Highway 26-McKibbon Drive &amp; St Vincent Street-Grey County 7

												
Lane Group	EBL2	EBL	NBL2	NBL	NBT	NBR	SBL	SBT	SEL	SET	NWL2	NWL
Lane Configurations												
Volume (vph)	1	1	1	81	35	8	51	57	4	418	3	3
Lane Group Flow (vph)	0	22	0	0	127	9	0	127	4	469	0	6
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm		Perm	Perm
Protected Phases		9			2			6		4		
Permitted Phases	9		2	2		2	6		4		8	8
Detector Phases	9	9	2	2	2	2	6	6	4	4	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	30.0	30.0	34.0	34.0	34.0	34.0	34.0	34.0	56.0	56.0	56.0	56.0
Total Split (%)	25.0%	25.0%	28.3%	28.3%	28.3%	28.3%	28.3%	28.3%	46.7%	46.7%	46.7%	46.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio		0.18			0.16	0.01		0.14	0.02	0.85		0.04
Control Delay		38.1			15.4	9.8		14.7	25.8	54.0		26.2
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay		38.1			15.4	9.8		14.7	25.8	54.0		26.2
Queue Length 50th (m)		2.7			11.0	0.0		10.6	0.7	104.2		1.0
Queue Length 95th (m)		10.8			32.3	3.1		31.0	3.0	125.6		3.7
Internal Link Dist (m)		68.1			4538.6			763.0		331.6		
Turn Bay Length (m)												
Base Capacity (vph)		361			788	953		914	257	812		248
Starvation Cap Reductn		0			0	0		0	0	0		0
Spillback Cap Reductn		0			0	0		0	0	0		0
Storage Cap Reductn		0			0	0		0	0	0		0
Reduced v/c Ratio		0.06			0.16	0.01		0.14	0.02	0.58		0.02

## Intersection Summary

Cycle Length: 120










Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Splits and Phases: 1: Highway 26-McKibbon Drive &amp; St Vincent Street-Grey County 7

				
34 s	56 s	30 s		
				
34 s	56 s			



















## 1: Highway 26-McKibbin Drive &amp; St Vincent Street-Grey County 7



Lane Group	NWT
Lane Configurations	P
Volume (vph)	400
Lane Group Flow (vph)	458
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	8
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	56.0
Total Split (%)	46.7%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	0.83
Control Delay	51.8
Queue Delay	0.0
Total Delay	51.8
Queue Length 50th (m)	100.4
Queue Length 95th (m)	121.5
Internal Link Dist (m)	393.4
Turn Bay Length (m)	
Base Capacity (vph)	811
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.56
Intersection Summary	













HCM Signalized Intersection Capacity Analysis  
1: Highway 26-McKibbin Drive & St Vincent Street-Grey County 7

Future (2033) Total AM

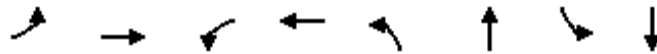
												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SBR2
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0		4.0		
Lane Util. Factor		1.00					1.00	1.00		1.00		
Frt		0.88					1.00	0.85		0.99		
Flt Protected		1.00					0.97	1.00		0.98		
Satd. Flow (prot)		1645					1820	1601		1824		
Flt Permitted		0.97					0.75	1.00		0.84		
Satd. Flow (perm)		1597					1407	1601		1573		
Volume (vph)	1	1	9	9	1	81	35	8	51	57	1	8
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	10	10	1	88	38	9	55	62	1	9
RTOR Reduction (vph)	0	10	0	0	0	0	0	4	0	1	0	0
Lane Group Flow (vph)	0	12	0	0	0	0	127	5	0	126	0	0
Turn Type	Perm				Perm		Perm	Perm		Perm		
Protected Phases	9						2				6	
Permitted Phases	9				2		2	2		6		
Actuated Green, G (s)	3.1						65.5	65.5			65.5	
Effective Green, g (s)	5.1						67.5	67.5			67.5	
Actuated g/C Ratio	0.04						0.56	0.56			0.56	
Clearance Time (s)	6.0						6.0	6.0			6.0	
Vehicle Extension (s)	3.0						3.0	3.0			3.0	
Lane Grp Cap (vph)	68						791	901			885	
v/s Ratio Prot												
v/s Ratio Perm	c0.01						c0.09	0.00			0.08	
v/c Ratio	0.18						0.16	0.01			0.14	
Uniform Delay, d1	55.4						12.6	11.5			12.5	
Progression Factor	1.00						1.00	1.00			1.00	
Incremental Delay, d2	1.3						0.4	0.0			0.3	
Delay (s)	56.7						13.1	11.5			12.8	
Level of Service	E						B	B			B	
Approach Delay (s)	56.7						13.0				12.8	
Approach LOS	E						B				B	
Intersection Summary												
HCM Average Control Delay	42.2				HCM Level of Service				D			
HCM Volume to Capacity ratio	0.39											
Actuated Cycle Length (s)	120.0				Sum of lost time (s)				12.0			
Intersection Capacity Utilization	49.2%				ICU Level of Service				A			
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
1: Highway 26-McKibbin Drive & St Vincent Street-Grey County 7

Future (2033) Total AM

								
Movement	SEL	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations								
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	1.00				1.00	1.00	
Frt	1.00	1.00				1.00	0.99	
Flt Protected	0.95	1.00				0.95	1.00	
Satd. Flow (prot)	1789	1874				1789	1869	
Flt Permitted	0.15	1.00				0.13	1.00	
Satd. Flow (perm)	280	1874				252	1869	
Volume (vph)	4	418	12	2	3	3	400	21
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	454	13	2	3	3	435	23
RTOR Reduction (vph)	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	4	469	0	0	0	6	456	0
Turn Type	Perm					Perm	Perm	
Protected Phases		4					8	
Permitted Phases	4				8	8		
Actuated Green, G (s)	33.4	33.4				33.4	33.4	
Effective Green, g (s)	35.4	35.4				35.4	35.4	
Actuated g/C Ratio	0.30	0.30				0.30	0.30	
Clearance Time (s)	6.0	6.0				6.0	6.0	
Vehicle Extension (s)	3.0	3.0				3.0	3.0	
Lane Grp Cap (vph)	83	553				74	551	
v/s Ratio Prot		c0.25					0.24	
v/s Ratio Perm	0.01					0.02		
v/c Ratio	0.05	0.85				0.08	0.83	
Uniform Delay, d1	30.3	39.8				30.6	39.5	
Progression Factor	1.00	1.00				1.00	1.00	
Incremental Delay, d2	0.2	11.6				0.5	9.9	
Delay (s)	30.5	51.3				31.0	49.3	
Level of Service	C	D				C	D	
Approach Delay (s)		51.2					49.1	
Approach LOS		D					D	
Intersection Summary								

## 2: Highway 26 &amp; Garden Centre Access-3rd Line



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↰	↱	↰	↱	↰	↱		↕
Volume (vph)	1	394	92	310	67	0	1	0
Lane Group Flow (vph)	1	479	100	337	73	138	0	2
Turn Type	Perm		pm+pt		Perm		Perm	
Protected Phases		4	3	8		2		6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	3	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	10.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	44.0	44.0	21.0	65.0	25.0	25.0	25.0	25.0
Total Split (%)	48.9%	48.9%	23.3%	72.2%	27.8%	27.8%	27.8%	27.8%
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
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Max	Max	Max	Max
v/c Ratio	0.00	0.71	0.22	0.34	0.15	0.15		0.00
Control Delay	13.0	23.7	7.5	8.8	20.3	0.4		17.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	13.0	23.7	7.5	8.8	20.3	0.4		17.5
Queue Length 50th (m)	0.1	48.3	5.2	20.0	6.3	0.0		0.1
Queue Length 95th (m)	0.9	78.7	10.3	31.9	18.6	0.0		1.7
Internal Link Dist (m)		82.1		668.4		114.4		99.1
Turn Bay Length (m)	15.0		30.0					
Base Capacity (vph)	529	937	547	1276	497	905		562
Starvation Cap Reductn	0	0	0	0	0	0		0
Spillback Cap Reductn	0	0	0	0	0	0		0
Storage Cap Reductn	0	0	0	0	0	0		0
Reduced v/c Ratio	0.00	0.51	0.18	0.26	0.15	0.15		0.00

## Intersection Summary

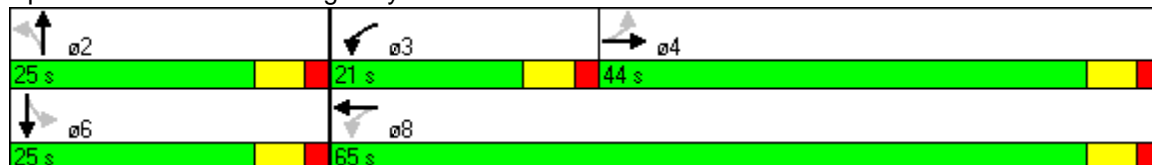
Cycle Length: 90

Actuated Cycle Length: 63.4

Natural Cycle: 60

Control Type: Semi Act-Uncoord



















Splits and Phases: 2: Highway 26 &amp; Garden Centre Access-3rd Line



## HCM Signalized Intersection Capacity Analysis










### 2: Highway 26 & Garden Centre Access-3rd Line

Future (2033) Total AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.85			0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	
Satd. Flow (prot)	1789	1853		1789	1883		1789	1601			1713	
Flt Permitted	0.56	1.00		0.21	1.00		0.76	1.00			0.92	
Satd. Flow (perm)	1051	1853		403	1883		1425	1601			1623	
Volume (vph)	1	394	47	92	310	0	67	0	127	1	0	1
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	428	51	100	337	0	73	0	138	1	0	1
RTOR Reduction (vph)	0	6	0	0	0	0	0	91	0	0	1	0
Lane Group Flow (vph)	1	473	0	100	337	0	73	47	0	0	1	0
Turn Type	Perm		pm+pt		Perm		Perm		Perm		Perm	
Protected Phases	4		3		8		2		6		6	
Permitted Phases	4		8		2		6		6		6	
Actuated Green, G (s)	20.8	20.8		32.4	32.4		20.0	20.0			20.0	
Effective Green, g (s)	22.8	22.8		34.4	34.4		22.0	22.0			22.0	
Actuated g/C Ratio	0.35	0.35		0.53	0.53		0.34	0.34			0.34	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	372	656		379	1006		487	547			554	
v/s Ratio Prot	c0.26		0.03		c0.18		0.03					
v/s Ratio Perm	0.00		0.11		c0.05						0.00	
v/c Ratio	0.00	0.72		0.26	0.33		0.15	0.09			0.00	
Uniform Delay, d1	13.4	18.0		9.4	8.5		14.7	14.4			14.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	3.9		0.4	0.2		0.7	0.3			0.0	
Delay (s)	13.5	22.0		9.8	8.7		15.4	14.7			14.0	
Level of Service	B	C		A	A		B	B			B	
Approach Delay (s)	21.9		8.9		14.9		14.0					
Approach LOS	C		A		B		B				B	
Intersection Summary												
HCM Average Control Delay			15.6		HCM Level of Service			B				
HCM Volume to Capacity ratio			0.43									
Actuated Cycle Length (s)			64.4		Sum of lost time (s)			12.0				
Intersection Capacity Utilization			46.5%		ICU Level of Service			A				
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Unsignalized Intersection Capacity Analysis 3: Sideroad 7 & 3rd Line
















Future (2033) Total AM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	42	0	7	22	15	51
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	0	8	24	16	55
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	83	44	72			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	83	44	72			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	100	100			
cM capacity (veh/h)	914	1026	1528			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	46	32	72			
Volume Left	46	8	0			
Volume Right	0	0	55			
cSH	914	1528	1700			
Volume to Capacity	0.05	0.00	0.04			
Queue Length 95th (m)	1.2	0.1	0.0			
Control Delay (s)	9.1	1.8	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.1	1.8	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		3.2				
Intersection Capacity Utilization		17.3%		ICU Level of Service		A
Analysis Period (min)		15				

# HCM Unsignalized Intersection Capacity Analysis



















## 4: Sideroad 7 & Grey County 7

Future (2033) Total AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	5	9	29	10	15	9	67	24	13	73	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	5	10	32	11	16	10	73	26	14	79	1
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	235	227	80	226	214	86	80			99		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	235	227	80	226	214	86	80			99		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	99	96	98	98	99			99		
cM capacity (veh/h)	690	662	980	709	673	973	1517			1494		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	18	59	109	95								
Volume Left	3	32	10	14								
Volume Right	10	16	26	1								
cSH	806	758	1517	1494								
Volume to Capacity	0.02	0.08	0.01	0.01								
Queue Length 95th (m)	0.5	1.9	0.1	0.2								
Control Delay (s)	9.6	10.1	0.7	1.2								
Lane LOS	A	B	A	A								
Approach Delay (s)	9.6	10.1	0.7	1.2								
Approach LOS	A	B										
Intersection Summary												
Average Delay			3.4									
Intersection Capacity Utilization		21.4%		ICU Level of Service						A		
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis 5: Sideroad 10 & Site Access 2 & 3rd Line










Future (2033) Total AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	23	0	78	5	64	25	55	57	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	25	0	85	5	70	27	60	62	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	349	291	64	276	280	83	66			97		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	349	291	64	276	280	83	66			97		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	96	100	91	100			96		
cM capacity (veh/h)	535	592	1000	654	601	976	1535			1497		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	0	110	5	97	60	66						
Volume Left	0	25	5	0	60	0						
Volume Right	0	85	0	27	0	4						
cSH	1700	878	1535	1700	1497	1700						
Volume to Capacity	0.00	0.13	0.00	0.06	0.04	0.04						
Queue Length 95th (m)	0.0	3.2	0.1	0.0	0.9	0.0						
Control Delay (s)	0.0	9.7	7.4	0.0	7.5	0.0						
Lane LOS	A	A	A		A							
Approach Delay (s)	0.0	9.7	0.4		3.6							
Approach LOS	A	A										
Intersection Summary												
Average Delay			4.6									
Intersection Capacity Utilization		22.5%		ICU Level of Service				A				
Analysis Period (min)		15										













# HCM Unsignalized Intersection Capacity Analysis 6: Site Access 3 & 3rd Line

Future (2033) Total AM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	14	41	52	12	30	50
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	45	57	13	33	54
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	183	63			70	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	183	63			70	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	96			98	
cM capacity (veh/h)	790	1002			1531	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	60	70	87			
Volume Left	15	0	33			
Volume Right	45	13	0			
cSH	937	1700	1531			
Volume to Capacity	0.06	0.04	0.02			
Queue Length 95th (m)	1.6	0.0	0.5			
Control Delay (s)	9.1	0.0	2.9			
Lane LOS	A		A			
Approach Delay (s)	9.1	0.0	2.9			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay		3.7				
Intersection Capacity Utilization		21.0%		ICU Level of Service		A
Analysis Period (min)		15				

# HCM Unsignalized Intersection Capacity Analysis 7: Site Access 2 & 3rd Line




















Future (2033) Total AM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free		Free	Free
Grade	0%		0%			0%
Volume (veh/h)	18	58	128	14	43	97
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	63	139	15	47	105
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	346	147			154	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	346	147			154	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	93			97	
cM capacity (veh/h)	630	900			1426	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	83	154	47	105		
Volume Left	20	0	47	0		
Volume Right	63	15	0	0		
cSH	817	1700	1426	1700		
Volume to Capacity	0.10	0.09	0.03	0.06		
Queue Length 95th (m)	2.6	0.0	0.8	0.0		
Control Delay (s)	9.9	0.0	7.6	0.0		
Lane LOS	A		A			
Approach Delay (s)	9.9	0.0	2.3			
Approach LOS	A					
Intersection Summary						
Average Delay		3.0				
Intersection Capacity Utilization		25.5%		ICU Level of Service		A
Analysis Period (min)		15				

## Queues

Future (2033) Total PM

## 1: Highway 26-McKibbon Drive &amp; St Vincent Street-Grey County 7

												
Lane Group	EBL2	EBL	NBL2	NBL	NBT	NBR	SBL	SBT	SEL	SET	NWL2	NWL
Lane Configurations												
Volume (vph)	1	1	2	92	73	15	131	61	8	652	15	6
Lane Group Flow (vph)	0	10	0	0	181	16	0	218	9	739	0	23
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm		Perm	Perm
Protected Phases		9			2			6		4		
Permitted Phases	9		2	2		2	6		4		8	8
Detector Phases	9	9	2	2	2	2	6	6	4	4	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	22.0	22.0	35.0	35.0	35.0	35.0	35.0	35.0	63.0	63.0	63.0	63.0
Total Split (%)	18.3%	18.3%	29.2%	29.2%	29.2%	29.2%	29.2%	29.2%	52.5%	52.5%	52.5%	52.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio		0.09			0.31	0.02		0.49	0.15	0.81		0.19
Control Delay		42.8			26.3	10.9		31.3	23.8	34.5		22.0
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay		42.8			26.3	10.9		31.3	23.8	34.5		22.0
Queue Length 50th (m)		1.4			26.8	0.0		35.2	1.1	141.6		2.9
Queue Length 95th (m)		6.8			53.2	5.0		70.6	5.0	195.3		9.0
Internal Link Dist (m)		68.1			4538.6			763.0		331.6		
Turn Bay Length (m)												
Base Capacity (vph)		247			589	689		449	63	921		124
Starvation Cap Reductn		0			0	0		0	0	0		0
Spillback Cap Reductn		0			0	0		0	0	0		0
Storage Cap Reductn		0			0	0		0	0	0		0
Reduced v/c Ratio		0.04			0.31	0.02		0.49	0.14	0.80		0.19

## Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

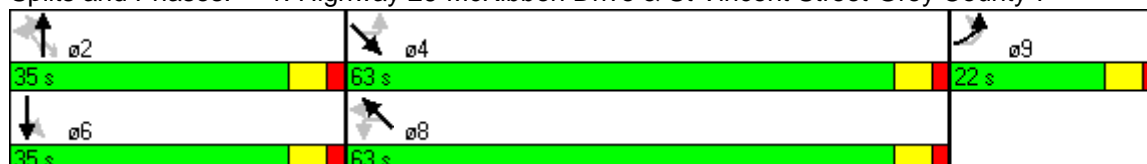
Natural Cycle: 90

Control Type: Actuated-Coordinated

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Highway 26-McKibbon Drive &amp; St Vincent Street-Grey County 7



## 1: Highway 26-McKibbin Drive &amp; St Vincent Street-Grey County 7



















Lane Group	NWT
Lane Configurations	P
Volume (vph)	793
Lane Group Flow (vph)	891
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	8
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	63.0
Total Split (%)	52.5%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	0.98
Control Delay	55.2
Queue Delay	0.0
Total Delay	55.2
Queue Length 50th (m)	196.8
Queue Length 95th (m)	286.3
Internal Link Dist (m)	393.4
Turn Bay Length (m)	
Base Capacity (vph)	922
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.97
Intersection Summary	

# HCM Signalized Intersection Capacity Analysis













Future (2033) Total PM

## 1: Highway 26-McKibbin Drive & St Vincent Street-Grey County 7

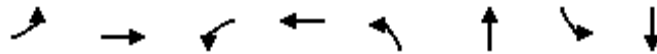
												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SBR2
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0		4.0		
Lane Util. Factor		1.00					1.00	1.00		1.00		
Frt		0.89					1.00	0.85		0.99		
Flt Protected		0.99					0.97	1.00		0.97		
Satd. Flow (prot)		1663					1832	1601		1813		
Flt Permitted		0.92					0.74	1.00		0.64		
Satd. Flow (perm)		1553					1389	1601		1205		
Volume (vph)	1	1	4	4	2	92	73	15	131	61	3	6
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	4	4	2	100	79	16	142	66	3	7
RTOR Reduction (vph)	0	4	0	0	0	0	0	10	0	1	0	0
Lane Group Flow (vph)	0	6	0	0	0	0	181	6	0	217	0	0
Turn Type	Perm				Perm		Perm	Perm	Perm	Perm		
Protected Phases	9						2				6	
Permitted Phases	9				2	2		2		6		
Actuated Green, G (s)		1.5					44.1	44.1		44.1		
Effective Green, g (s)		3.5					46.1	46.1		46.1		
Actuated g/C Ratio		0.03					0.38	0.38		0.38		
Clearance Time (s)		6.0					6.0	6.0		6.0		
Vehicle Extension (s)		3.0					3.0	3.0		3.0		
Lane Grp Cap (vph)		45					534	615		463		
v/s Ratio Prot												
v/s Ratio Perm		c0.00					0.13	0.00		c0.18		
v/c Ratio		0.14					0.34	0.01		0.47		
Uniform Delay, d1		56.8					26.2	22.8		27.8		
Progression Factor		1.00					1.00	1.00		1.00		
Incremental Delay, d2		1.4					1.7	0.0		3.4		
Delay (s)		58.2					27.9	22.9		31.2		
Level of Service		E					C	C		C		
Approach Delay (s)		58.2					27.5			31.2		
Approach LOS		E					C			C		
<b>Intersection Summary</b>												
HCM Average Control Delay		40.6					HCM Level of Service			D		
HCM Volume to Capacity ratio		0.73										
Actuated Cycle Length (s)		120.0					Sum of lost time (s)			12.0		
Intersection Capacity Utilization		74.4%					ICU Level of Service			D		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
1: Highway 26-McKibbin Drive & St Vincent Street-Grey County 7

Future (2033) Total PM

								
Movement	SEL	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations								
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	1.00				1.00	1.00	
Frt	1.00	0.99				1.00	1.00	
Flt Protected	0.95	1.00				0.95	1.00	
Satd. Flow (prot)	1789	1872				1789	1874	
Flt Permitted	0.07	1.00				0.13	1.00	
Satd. Flow (perm)	129	1872				242	1874	
Volume (vph)	8	652	21	6	15	6	793	27
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	709	23	7	16	7	862	29
RTOR Reduction (vph)	0	1	0	0	0	0	1	0
Lane Group Flow (vph)	9	738	0	0	0	23	890	0
Turn Type	Perm					Perm	Perm	
Protected Phases		4					8	
Permitted Phases	4				8	8		
Actuated Green, G (s)	56.4	56.4				56.4	56.4	
Effective Green, g (s)	58.4	58.4				58.4	58.4	
Actuated g/C Ratio	0.49	0.49				0.49	0.49	
Clearance Time (s)	6.0	6.0				6.0	6.0	
Vehicle Extension (s)	3.0	3.0				3.0	3.0	
Lane Grp Cap (vph)	63	911				118	912	
v/s Ratio Prot		0.39					c0.47	
v/s Ratio Perm	0.07					0.10		
v/c Ratio	0.14	0.81				0.19	0.98	
Uniform Delay, d1	17.0	26.1				17.5	30.1	
Progression Factor	1.00	1.00				1.00	1.00	
Incremental Delay, d2	1.0	5.5				0.8	23.8	
Delay (s)	18.0	31.6				18.3	53.9	
Level of Service	B	C				B	D	
Approach Delay (s)		31.5					53.0	
Approach LOS		C					D	
Intersection Summary								

## 2: Highway 26 &amp; Garden Centre Access-3rd Line



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↰	↷	↰	↷	↰	↷		↕
Volume (vph)	1	483	187	575	89	0	1	0
Lane Group Flow (vph)	1	621	203	626	97	182	0	1
Turn Type	Perm		pm+pt		Perm		Perm	
Protected Phases		4	3	8		2		6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	3	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	10.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	45.0	45.0	19.0	64.0	26.0	26.0	26.0	26.0
Total Split (%)	50.0%	50.0%	21.1%	71.1%	28.9%	28.9%	28.9%	28.9%
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
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Max	Max	Max	Max
v/c Ratio	0.00	0.82	0.48	0.55	0.23	0.23		0.00
Control Delay	13.0	29.9	10.4	10.7	26.4	0.7		25.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	13.0	29.9	10.4	10.7	26.4	0.7		25.0
Queue Length 50th (m)	0.1	75.9	11.7	47.5	11.1	0.0		0.1
Queue Length 95th (m)	0.9	121.6	19.5	70.4	26.6	0.0		1.3
Internal Link Dist (m)		82.1		668.4		114.4		99.1
Turn Bay Length (m)	15.0		30.0					
Base Capacity (vph)	382	882	469	1255	414	787		293
Starvation Cap Reductn	0	0	0	0	0	0		0
Spillback Cap Reductn	0	0	0	0	0	0		0
Storage Cap Reductn	0	0	0	0	0	0		0
Reduced v/c Ratio	0.00	0.70	0.43	0.50	0.23	0.23		0.00

## Intersection Summary

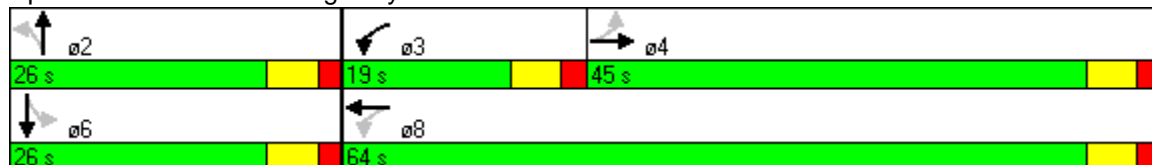
Cycle Length: 90

Actuated Cycle Length: 77.2

Natural Cycle: 60

Control Type: Semi Act-Uncoord



















Splits and Phases: 2: Highway 26 &amp; Garden Centre Access-3rd Line



## HCM Signalized Intersection Capacity Analysis

### 2: Highway 26 & Garden Centre Access-3rd Line










Future (2033) Total PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.85			1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.95	
Satd. Flow (prot)	1789	1840		1789	1883		1789	1601			1789	
Flt Permitted	0.43	1.00		0.14	1.00		0.76	1.00			0.58	
Satd. Flow (perm)	805	1840		260	1883		1426	1601			1095	
Volume (vph)	1	483	88	187	575	1	89	0	167	1	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	525	96	203	625	1	97	0	182	1	0	0
RTOR Reduction (vph)	0	8	0	0	0	0	0	129	0	0	0	0
Lane Group Flow (vph)	1	613	0	203	626	0	97	53	0	0	1	0
Turn Type	Perm		pm+pt		Perm		Perm		Perm		Perm	
Protected Phases	4		3		8		2		2		6	
Permitted Phases	4		8		2		6					
Actuated Green, G (s)	29.4	29.4		44.6	44.6		20.4	20.4			20.4	
Effective Green, g (s)	31.4	31.4		46.6	46.6		22.4	22.4			22.4	
Actuated g/C Ratio	0.41	0.41		0.61	0.61		0.29	0.29			0.29	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	328	750		380	1140		415	466			319	
v/s Ratio Prot	c0.33		0.08		c0.33		0.03					
v/s Ratio Perm	0.00		0.25		c0.07						0.00	
v/c Ratio	0.00	0.82		0.53	0.55		0.23	0.11			0.00	
Uniform Delay, d1	13.5	20.3		11.8	9.0		20.8	20.0			19.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	6.9		1.4	0.5		1.3	0.5			0.0	
Delay (s)	13.5	27.2		13.2	9.5		22.1	20.5			19.4	
Level of Service	B	C		B	A		C	C			B	
Approach Delay (s)	27.1		10.4		21.1		19.4					
Approach LOS	C		B		C		B					
Intersection Summary												
HCM Average Control Delay			18.2		HCM Level of Service			B				
HCM Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			77.0		Sum of lost time (s)			12.0				
Intersection Capacity Utilization			61.5%		ICU Level of Service			B				
Analysis Period (min)			15									
c Critical Lane Group												



















# HCM Unsignalized Intersection Capacity Analysis 3: Sideroad 7 & 3rd Line

Future (2033) Total PM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	62	2	0	14	21	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	67	2	0	15	23	63
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	70	54	86			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	70	54	86			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	100	100			
cM capacity (veh/h)	935	1013	1510			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	70	15	86			
Volume Left	67	0	0			
Volume Right	2	0	63			
cSH	937	1510	1700			
Volume to Capacity	0.07	0.00	0.05			
Queue Length 95th (m)	1.8	0.0	0.0			
Control Delay (s)	9.1	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	9.1	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			3.7			
Intersection Capacity Utilization			14.9%		ICU Level of Service	
Analysis Period (min)			15			



















# HCM Unsignalized Intersection Capacity Analysis 4: Sideroad 7 & Grey County 7

Future (2033) Total PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	7	0	29	9	21	3	50	33	21	52	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	8	0	32	10	23	3	54	36	23	57	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	211	201	59	187	185	72	61			90		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	211	201	59	187	185	72	61			90		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	100	96	99	98	100			98		
cM capacity (veh/h)	712	683	1007	757	697	990	1542			1505		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	11	64	93	84								
Volume Left	3	32	3	23								
Volume Right	0	23	36	4								
cSH	691	814	1542	1505								
Volume to Capacity	0.02	0.08	0.00	0.02								
Queue Length 95th (m)	0.4	1.9	0.0	0.4								
Control Delay (s)	10.3	9.8	0.3	2.1								
Lane LOS	B	A	A	A								
Approach Delay (s)	10.3	9.8	0.3	2.1								
Approach LOS	B	A										
Intersection Summary												
Average Delay			3.7									
Intersection Capacity Utilization	23.1%		ICU Level of Service		A							
Analysis Period (min)	15											










# HCM Unsignalized Intersection Capacity Analysis 5: Sideroad 10 & Site Access 2 & 3rd Line

Future (2033) Total PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	27	0	89	0	91	28	101	87	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	29	0	97	0	99	30	110	95	2
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	511	445	96	428	430	114	97			129		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	511	445	96	428	430	114	97			129		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	94	100	90	100			92		
cM capacity (veh/h)	400	470	961	506	478	938	1497			1456		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	0	126	0	129	110	97						
Volume Left	0	29	0	0	110	0						
Volume Right	0	97	0	30	0	2						
cSH	1700	783	1700	1700	1456	1700						
Volume to Capacity	0.00	0.16	0.00	0.08	0.08	0.06						
Queue Length 95th (m)	0.0	4.3	0.0	0.0	1.9	0.0						
Control Delay (s)	0.0	10.5	0.0	0.0	7.7	0.0						
Lane LOS	A	B			A							
Approach Delay (s)	0.0	10.5	0.0		4.1							
Approach LOS	A	B										
Intersection Summary												
Average Delay			4.7									
Intersection Capacity Utilization		25.9%		ICU Level of Service				A				
Analysis Period (min)		15										











# HCM Unsignalized Intersection Capacity Analysis 6: Site Access 3 & 3rd Line

Future (2033) Total PM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	15	51	61	15	57	57
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	55	66	16	62	62
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	260	74			83	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	260	74			83	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	94			96	
cM capacity (veh/h)	699	987			1515	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	72	83	124			
Volume Left	16	0	62			
Volume Right	55	16	0			
cSH	902	1700	1515			
Volume to Capacity	0.08	0.05	0.04			
Queue Length 95th (m)	2.0	0.0	1.0			
Control Delay (s)	9.3	0.0	3.9			
Lane LOS	A		A			
Approach Delay (s)	9.3	0.0	3.9			
Approach LOS	A					
Intersection Summary						
Average Delay		4.1				
Intersection Capacity Utilization		23.5%		ICU Level of Service		A
Analysis Period (min)		15				

# HCM Unsignalized Intersection Capacity Analysis 7: Site Access 2 & 3rd Line




















Future (2033) Total PM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free		Free	Free
Grade	0%		0%			0%
Volume (veh/h)	25	83	153	27	95	165
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	90	166	29	103	179
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	567	181			196	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	567	181			196	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	90			93	
cM capacity (veh/h)	449	862			1377	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	117	196	103	179		
Volume Left	27	0	103	0		
Volume Right	90	29	0	0		
cSH	710	1700	1377	1700		
Volume to Capacity	0.17	0.12	0.07	0.11		
Queue Length 95th (m)	4.5	0.0	1.8	0.0		
Control Delay (s)	11.1	0.0	7.8	0.0		
Lane LOS	B		A			
Approach Delay (s)	11.1	0.0	2.9			
Approach LOS	B					
Intersection Summary						
Average Delay		3.5				
Intersection Capacity Utilization		31.5%		ICU Level of Service		A
Analysis Period (min)		15				

## Queues

Future (2033) Total SAT

## 1: Highway 26-McKibbon Drive &amp; St Vincent Street-Grey County 7

												
Lane Group	EBL2	EBL	NBL2	NBL	NBT	NBR	SBL	SBT	SEL	SET	NWL2	NWL
Lane Configurations												
Volume (vph)	1	1	2	109	36	8	71	59	4	510	1	5
Lane Group Flow (vph)	0	14	0	0	159	9	0	143	4	614	0	6
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm		Perm	Perm
Protected Phases		9			2			6		4		
Permitted Phases	9		2	2		2	6		4		8	8
Detector Phases	9	9	2	2	2	2	6	6	4	4	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	26.0	26.0	33.0	33.0	33.0	33.0	33.0	33.0	61.0	61.0	61.0	61.0
Total Split (%)	21.7%	21.7%	27.5%	27.5%	27.5%	27.5%	27.5%	27.5%	50.8%	50.8%	50.8%	50.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio		0.12			0.24	0.01		0.22	0.02	0.88		0.04
Control Delay		38.8			22.1	13.0		21.7	19.0	48.7		19.8
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay		38.8			22.1	13.0		21.7	19.0	48.7		19.8
Queue Length 50th (m)		1.6			18.3	0.0		16.2	0.6	132.7		0.9
Queue Length 95th (m)		8.1			46.9	3.6		42.1	2.5	152.7		3.2
Internal Link Dist (m)		68.1			4538.6			763.0		331.6		
Turn Bay Length (m)												
Base Capacity (vph)		305			649	825		657	294	881		192
Starvation Cap Reductn		0			0	0		0	0	0		0
Spillback Cap Reductn		0			0	0		0	0	0		0
Storage Cap Reductn		0			0	0		0	0	0		0
Reduced v/c Ratio		0.05			0.24	0.01		0.22	0.01	0.70		0.03

## Intersection Summary

Cycle Length: 120







Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Splits and Phases: 1: Highway 26-McKibbon Drive &amp; St Vincent Street-Grey County 7

			
33 s	61 s	26 s	
			
33 s	61 s		

## 1: Highway 26-McKibbin Drive &amp; St Vincent Street-Grey County 7




















Lane Group	NWT
Lane Configurations	P
Volume (vph)	416
Lane Group Flow (vph)	479
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	8
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	61.0
Total Split (%)	50.8%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	0.68
Control Delay	35.3
Queue Delay	0.0
Total Delay	35.3
Queue Length 50th (m)	92.3
Queue Length 95th (m)	107.9
Internal Link Dist (m)	393.4
Turn Bay Length (m)	
Base Capacity (vph)	889
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.54
Intersection Summary	

# HCM Signalized Intersection Capacity Analysis

Future (2033) Total SAT

## 1: Highway 26-McKibbin Drive & St Vincent Street-Grey County 7

												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SEL
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0		4.0		4.0
Lane Util. Factor		1.00					1.00	1.00		1.00		1.00
Frt		0.88					1.00	0.85		1.00		1.00
Flt Protected		0.99					0.96	1.00		0.97		0.95
Satd. Flow (prot)		1654					1815	1601		1831		1789
Flt Permitted		0.95					0.72	1.00		0.78		0.24
Satd. Flow (perm)		1579					1352	1601		1469		450
Volume (vph)	1	1	5	6	2	109	36	8	71	59	2	4
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	5	7	2	118	39	9	77	64	2	4
RTOR Reduction (vph)	0	7	0	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	7	0	0	0	0	159	4	0	143	0	4
Turn Type	Perm				Perm	Perm		Perm	Perm			Perm
Protected Phases		9					2			6		
Permitted Phases	9				2	2		2	6			4
Actuated Green, G (s)		2.9					55.9	55.9		55.9		43.2
Effective Green, g (s)		4.9					57.9	57.9		57.9		45.2
Actuated g/C Ratio		0.04					0.48	0.48		0.48		0.38
Clearance Time (s)		6.0					6.0	6.0		6.0		6.0
Vehicle Extension (s)		3.0					3.0	3.0		3.0		3.0
Lane Grp Cap (vph)		64					652	772		709		170
v/s Ratio Prot												
v/s Ratio Perm		c0.00					c0.12	0.00		0.10		0.01
v/c Ratio		0.11					0.24	0.01		0.20		0.02
Uniform Delay, d1		55.5					18.2	16.1		17.8		23.5
Progression Factor		1.00					1.00	1.00		1.00		1.00
Incremental Delay, d2		0.8					0.9	0.0		0.6		0.1
Delay (s)		56.3					19.1	16.1		18.4		23.6
Level of Service		E					B	B		B		C
Approach Delay (s)		56.3					18.9			18.4		
Approach LOS		E					B			B		
<b>Intersection Summary</b>												
HCM Average Control Delay		36.3					HCM Level of Service			D		
HCM Volume to Capacity ratio		0.50										
Actuated Cycle Length (s)		120.0					Sum of lost time (s)			12.0		
Intersection Capacity Utilization		57.4%					ICU Level of Service			B		
Analysis Period (min)		15										
c Critical Lane Group												



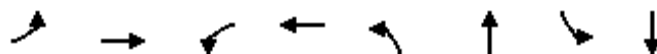
HCM Signalized Intersection Capacity Analysis  
 1: Highway 26-McKibbin Drive & St Vincent Street-Grey County 7

Future (2033) Total SAT



Movement	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations	PT				PT	PT	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0				4.0	4.0	
Lane Util. Factor	1.00				1.00	1.00	
Frt	0.99				1.00	0.99	
Flt Protected	1.00				0.95	1.00	
Satd. Flow (prot)	1856				1789	1868	
Flt Permitted	1.00				0.10	1.00	
Satd. Flow (perm)	1856				189	1868	
Volume (vph)	510	51	5	1	5	416	25
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	554	55	5	1	5	452	27
RTOR Reduction (vph)	0	0	0	0	0	2	0
Lane Group Flow (vph)	614	0	0	0	6	477	0
Turn Type				Perm	Perm		
Protected Phases	4					8	
Permitted Phases				8	8		
Actuated Green, G (s)	43.2				43.2	43.2	
Effective Green, g (s)	45.2				45.2	45.2	
Actuated g/C Ratio	0.38				0.38	0.38	
Clearance Time (s)	6.0				6.0	6.0	
Vehicle Extension (s)	3.0				3.0	3.0	
Lane Grp Cap (vph)	699				71	704	
v/s Ratio Prot	0.33					0.26	
v/s Ratio Perm					0.03		
v/c Ratio	0.88				0.08	0.68	
Uniform Delay, d1	34.8				24.1	31.3	
Progression Factor	1.00				1.00	1.00	
Incremental Delay, d2	12.1				0.5	2.6	
Delay (s)	46.9				24.6	33.9	
Level of Service	D				C	C	
Approach Delay (s)	46.8					33.8	
Approach LOS	D					C	
Intersection Summary							

## 2: Highway 26 &amp; Garden Centre Access-3rd Line



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↰	↷	↰	↷	↰	↷		↕
Volume (vph)	4	464	169	474	103	0	1	0
Lane Group Flow (vph)	4	676	184	515	112	249	0	5
Turn Type	Perm		pm+pt		pm+pt		Perm	
Protected Phases		4	3	8	5	2		6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	3	8	5	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	10.0	22.0	10.0	22.0	22.0	22.0
Total Split (s)	44.0	44.0	11.0	55.0	11.0	35.0	24.0	24.0
Total Split (%)	48.9%	48.9%	12.2%	61.1%	12.2%	38.9%	26.7%	26.7%
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
Lead/Lag	Lag	Lag	Lead		Lead		Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	Max
v/c Ratio	0.01	0.88	0.71	0.50	0.22	0.31		0.01
Control Delay	14.2	36.9	27.6	14.1	21.5	1.5		19.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	14.2	36.9	27.6	14.1	21.5	1.5		19.2
Queue Length 50th (m)	0.4	96.1	14.3	49.4	13.4	0.0		0.1
Queue Length 95th (m)	2.2	#158.4	#37.3	73.6	25.2	2.9		2.9
Internal Link Dist (m)		82.1		668.4		114.4		99.1
Turn Bay Length (m)	15.0		30.0					
Base Capacity (vph)	390	819	259	1067	513	802		423
Starvation Cap Reductn	0	0	0	0	0	0		0
Spillback Cap Reductn	0	0	0	0	0	0		0
Storage Cap Reductn	0	0	0	0	0	0		0
Reduced v/c Ratio	0.01	0.83	0.71	0.48	0.22	0.31		0.01

## Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 85.8

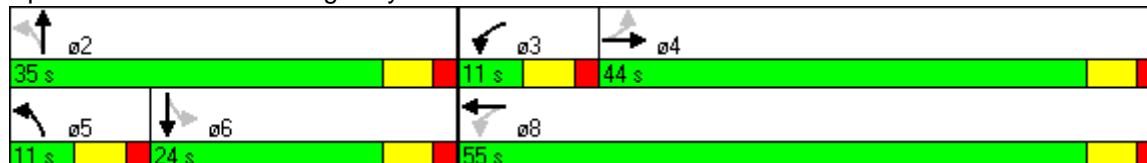
Natural Cycle: 80

Control Type: Semi Act-Uncoord

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.




















## Splits and Phases: 2: Highway 26 &amp; Garden Centre Access-3rd Line



## HCM Signalized Intersection Capacity Analysis










### 2: Highway 26 & Garden Centre Access-3rd Line

Future (2033) Total SAT

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.96		1.00	1.00		1.00	0.85			0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1789	1812		1789	1883		1789	1601			1663	
Flt Permitted	0.46	1.00		0.10	1.00		0.72	1.00			0.95	
Satd. Flow (perm)	861	1812		190	1883		1365	1601			1603	
Volume (vph)	4	464	158	169	474	0	103	0	229	1	0	4
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	504	172	184	515	0	112	0	249	1	0	4
RTOR Reduction (vph)	0	15	0	0	0	0	0	156	0	0	3	0
Lane Group Flow (vph)	4	661	0	184	515	0	112	93	0	0	2	0
Turn Type	Perm			pm+pt			pm+pt			Perm		
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	33.6	33.6		44.6	44.6		30.5	30.5			20.6	
Effective Green, g (s)	35.6	35.6		46.6	46.6		32.5	32.5			22.6	
Actuated g/C Ratio	0.41	0.41		0.54	0.54		0.37	0.37			0.26	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	352	741		230	1007		538	597			416	
v/s Ratio Prot		c0.36		c0.06	0.27		c0.01	0.06				
v/s Ratio Perm	0.00			0.36			c0.06				0.00	
v/c Ratio	0.01	0.89		0.80	0.51		0.21	0.16			0.00	
Uniform Delay, d1	15.3	24.0		17.5	13.0		18.4	18.2			23.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	13.1		17.8	0.4		0.2	0.6			0.0	
Delay (s)	15.3	37.0		35.2	13.4		18.5	18.7			23.9	
Level of Service	B	D		D	B		B	B			C	
Approach Delay (s)		36.9			19.2			18.7			23.9	
Approach LOS		D			B			B			C	
<b>Intersection Summary</b>												
HCM Average Control Delay			26.0			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			87.1			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			67.6%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Unsignalized Intersection Capacity Analysis 3: Sideroad 7 & 3rd Line

















Future (2033) Total SAT

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	100	5	0	20	31	91
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	109	5	0	22	34	99
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	105	83	133			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	105	83	133			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	99	100			
cM capacity (veh/h)	893	976	1452			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	114	22	133			
Volume Left	109	0	0			
Volume Right	5	0	99			
cSH	897	1452	1700			
Volume to Capacity	0.13	0.00	0.08			
Queue Length 95th (m)	3.3	0.0	0.0			
Control Delay (s)	9.6	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	9.6	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		4.1				
Intersection Capacity Utilization		19.7%		ICU Level of Service	A	
Analysis Period (min)		15				

# HCM Unsignalized Intersection Capacity Analysis



















## 4: Sideroad 7 & Grey County 7

Future (2033) Total SAT

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	6	13	3	51	15	27	6	100	33	48	87	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	14	3	55	16	29	7	109	36	52	95	10
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	381	361	99	354	348	127	104			145		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	381	361	99	354	348	127	104			145		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	97	100	90	97	97	100			96		
cM capacity (veh/h)	529	543	956	569	552	924	1487			1438		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	24	101	151	157								
Volume Left	7	55	7	52								
Volume Right	3	29	36	10								
cSH	573	637	1487	1438								
Volume to Capacity	0.04	0.16	0.00	0.04								
Queue Length 95th (m)	1.0	4.3	0.1	0.9								
Control Delay (s)	11.6	11.7	0.4	2.7								
Lane LOS	B	B	A	A								
Approach Delay (s)	11.6	11.7	0.4	2.7								
Approach LOS	B	B										
Intersection Summary												
Average Delay			4.5									
Intersection Capacity Utilization			35.3%		ICU Level of Service					A		
Analysis Period (min)			15									










# HCM Unsignalized Intersection Capacity Analysis 5: Sideroad 10 & Site Access 2 & 3rd Line

Future (2033) Total SAT

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	46	0	125	5	115	45	132	129	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	50	0	136	5	125	49	143	140	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	701	614	142	588	592	149	145			174		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	701	614	142	588	592	149	145			174		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	87	100	85	100			90		
cM capacity (veh/h)	276	364	905	387	375	897	1438			1403		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	0	186	5	174	143	145						
Volume Left	0	50	5	0	143	0						
Volume Right	0	136	0	49	0	4						
cSH	1700	662	1438	1700	1403	1700						
Volume to Capacity	0.00	0.28	0.00	0.10	0.10	0.09						
Queue Length 95th (m)	0.0	8.7	0.1	0.0	2.6	0.0						
Control Delay (s)	0.0	12.5	7.5	0.0	7.9	0.0						
Lane LOS	A	B	A		A							
Approach Delay (s)	0.0	12.5	0.2		3.9							
Approach LOS	A	B										
Intersection Summary												
Average Delay			5.4									
Intersection Capacity Utilization			36.4%		ICU Level of Service		A					
Analysis Period (min)			15									











# HCM Unsignalized Intersection Capacity Analysis 6: Site Access 3 & 3rd Line

Future (2033) Total SAT

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	24	68	97	23	70	105
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	74	105	25	76	114
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	384	118			130	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	384	118			130	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	92			95	
cM capacity (veh/h)	586	934			1455	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	100	130	190			
Volume Left	26	0	76			
Volume Right	74	25	0			
cSH	809	1700	1455			
Volume to Capacity	0.12	0.08	0.05			
Queue Length 95th (m)	3.2	0.0	1.3			
Control Delay (s)	10.1	0.0	3.3			
Lane LOS	B		A			
Approach Delay (s)	10.1	0.0	3.3			
Approach LOS	B					
Intersection Summary						
Average Delay		3.9				
Intersection Capacity Utilization		28.2%		ICU Level of Service		A
Analysis Period (min)		15				

# HCM Unsignalized Intersection Capacity Analysis 7: Site Access 2 & 3rd Line

Future (2033) Total SAT

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free		Free	Free
Grade	0%		0%			0%
Volume (veh/h)	41	107	204	36	102	224
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	45	116	222	39	111	243
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	707	241			261	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	707	241			261	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	88	85			91	
cM capacity (veh/h)	368	798			1304	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	161	261	111	243		
Volume Left	45	0	111	0		
Volume Right	116	39	0	0		
cSH	602	1700	1304	1700		
Volume to Capacity	0.27	0.15	0.09	0.14		
Queue Length 95th (m)	8.1	0.0	2.1	0.0		
Control Delay (s)	13.1	0.0	8.0	0.0		
Lane LOS	B		A			
Approach Delay (s)	13.1	0.0	2.5			
Approach LOS	B					
Intersection Summary						
Average Delay		3.9				
Intersection Capacity Utilization		37.4%		ICU Level of Service	A	
Analysis Period (min)		15				






















**APPENDIX K**  
**Future (2038) Total Traffic Conditions**  
**Analysis Outputs**  
Level of Service Calculations

## Queues

Future (2038) Total AM

## 1: Highway 26-McKibbon Drive &amp; St Vincent Street-Grey County 7

												
Lane Group	EBL2	EBL	NBL2	NBL	NBT	NBR	SBL	SBT	SEL	SET	NWL2	NWL
Lane Configurations												
Volume (vph)	1	1	1	81	39	8	51	62	4	457	3	3
Lane Group Flow (vph)	0	22	0	0	131	9	0	132	4	512	0	6
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm		Perm	Perm
Protected Phases		9			2			6		4		
Permitted Phases	9		2	2		2	6		4		8	8
Detector Phases	9	9	2	2	2	2	6	6	4	4	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	30.0	30.0	34.0	34.0	34.0	34.0	34.0	34.0	56.0	56.0	56.0	56.0
Total Split (%)	25.0%	25.0%	28.3%	28.3%	28.3%	28.3%	28.3%	28.3%	46.7%	46.7%	46.7%	46.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio		0.18			0.17	0.01		0.15	0.02	0.86		0.04
Control Delay		38.1			16.9	10.6		16.1	24.0	52.8		24.7
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay		38.1			16.9	10.6		16.1	24.0	52.8		24.7
Queue Length 50th (m)		2.7			12.3	0.0		11.9	0.7	113.2		1.0
Queue Length 95th (m)		10.8			34.6	3.2		33.4	2.9	135.1		3.6
Internal Link Dist (m)		68.1			4538.6			763.0		331.6		
Turn Bay Length (m)												
Base Capacity (vph)		361			757	917		885	228	813		216
Starvation Cap Reductn		0			0	0		0	0	0		0
Spillback Cap Reductn		0			0	0		0	0	0		0
Storage Cap Reductn		0			0	0		0	0	0		0
Reduced v/c Ratio		0.06			0.17	0.01		0.15	0.02	0.63		0.03

## Intersection Summary

Cycle Length: 120






Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Splits and Phases: 1: Highway 26-McKibbon Drive &amp; St Vincent Street-Grey County 7

 ø2	 ø4	 ø9
34 s	56 s	30 s
 ø6	 ø8	
34 s	56 s	

















## 1: Highway 26-McKibbin Drive &amp; St Vincent Street-Grey County 7



Lane Group	NWT
Lane Configurations	P
Volume (vph)	435
Lane Group Flow (vph)	496
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	8
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	56.0
Total Split (%)	46.7%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	0.83
Control Delay	49.9
Queue Delay	0.0
Total Delay	49.9
Queue Length 50th (m)	107.8
Queue Length 95th (m)	129.2
Internal Link Dist (m)	393.4
Turn Bay Length (m)	
Base Capacity (vph)	812
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.61
Intersection Summary	













HCM Signalized Intersection Capacity Analysis  
1: Highway 26-McKibbin Drive & St Vincent Street-Grey County 7

Future (2038) Total AM

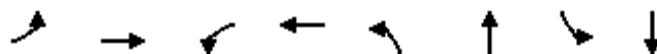
												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SBR2
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0		4.0		
Lane Util. Factor		1.00					1.00	1.00		1.00		
Frt		0.88					1.00	0.85		0.99		
Flt Protected		1.00					0.97	1.00		0.98		
Satd. Flow (prot)		1645					1822	1601		1826		
Flt Permitted		0.97					0.75	1.00		0.85		
Satd. Flow (perm)		1597					1411	1601		1579		
Volume (vph)	1	1	9	9	1	81	39	8	51	62	1	8
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	10	10	1	88	42	9	55	67	1	9
RTOR Reduction (vph)	0	10	0	0	0	0	0	4	0	1	0	0
Lane Group Flow (vph)	0	12	0	0	0	0	131	5	0	131	0	0
Turn Type	Perm				Perm		Perm	Perm		Perm		
Protected Phases	9						2			6		
Permitted Phases	9				2		2	2		6		
Actuated Green, G (s)	3.1						62.9	62.9		62.9		
Effective Green, g (s)	5.1						64.9	64.9		64.9		
Actuated g/C Ratio	0.04						0.54	0.54		0.54		
Clearance Time (s)	6.0						6.0	6.0		6.0		
Vehicle Extension (s)	3.0						3.0	3.0		3.0		
Lane Grp Cap (vph)	68						763	866		854		
v/s Ratio Prot												
v/s Ratio Perm	c0.01						c0.09	0.00		0.08		
v/c Ratio	0.18						0.17	0.01		0.15		
Uniform Delay, d1	55.4						13.9	12.7		13.8		
Progression Factor	1.00						1.00	1.00		1.00		
Incremental Delay, d2	1.3						0.5	0.0		0.4		
Delay (s)	56.7						14.4	12.7		14.2		
Level of Service	E						B	B		B		
Approach Delay (s)	56.7						14.3			14.2		
Approach LOS	E						B			B		
Intersection Summary												
HCM Average Control Delay	42.1				HCM Level of Service				D			
HCM Volume to Capacity ratio	0.42											
Actuated Cycle Length (s)	120.0				Sum of lost time (s)				12.0			
Intersection Capacity Utilization	51.5%				ICU Level of Service				A			
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
1: Highway 26-McKibbin Drive & St Vincent Street-Grey County 7

Future (2038) Total AM

								
Movement	SEL	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations								
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	1.00				1.00	1.00	
Frt	1.00	1.00				1.00	0.99	
Flt Protected	0.95	1.00				0.95	1.00	
Satd. Flow (prot)	1789	1875				1789	1870	
Flt Permitted	0.14	1.00				0.12	1.00	
Satd. Flow (perm)	258	1875				221	1870	
Volume (vph)	4	457	12	2	3	3	435	21
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	497	13	2	3	3	473	23
RTOR Reduction (vph)	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	4	512	0	0	0	6	494	0
Turn Type	Perm				Perm	Perm		
Protected Phases		4					8	
Permitted Phases	4				8	8		
Actuated Green, G (s)	36.0	36.0				36.0	36.0	
Effective Green, g (s)	38.0	38.0				38.0	38.0	
Actuated g/C Ratio	0.32	0.32				0.32	0.32	
Clearance Time (s)	6.0	6.0				6.0	6.0	
Vehicle Extension (s)	3.0	3.0				3.0	3.0	
Lane Grp Cap (vph)	82	594				70	592	
v/s Ratio Prot		c0.27					0.26	
v/s Ratio Perm	0.02					0.03		
v/c Ratio	0.05	0.86				0.09	0.83	
Uniform Delay, d1	28.5	38.5				28.8	38.1	
Progression Factor	1.00	1.00				1.00	1.00	
Incremental Delay, d2	0.2	12.3				0.5	9.8	
Delay (s)	28.7	50.8				29.3	47.9	
Level of Service	C	D				C	D	
Approach Delay (s)		50.6					47.7	
Approach LOS		D					D	
Intersection Summary								

## 2: Highway 26 &amp; Garden Centre Access-3rd Line



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	1	433	92	341	67	0	1	0
Lane Group Flow (vph)	1	522	100	371	73	138	0	2
Turn Type	Perm		pm+pt		Perm		Perm	
Protected Phases		4	3	8		2		6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	3	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	10.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	44.0	44.0	21.0	65.0	25.0	25.0	25.0	25.0
Total Split (%)	48.9%	48.9%	23.3%	72.2%	27.8%	27.8%	27.8%	27.8%
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
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Max	Max	Max	Max
v/c Ratio	0.00	0.73	0.24	0.37	0.15	0.16		0.00
Control Delay	12.0	24.1	7.5	8.8	21.7	0.4		18.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	12.0	24.1	7.5	8.8	21.7	0.4		18.5
Queue Length 50th (m)	0.1	54.6	5.2	22.4	6.6	0.0		0.1
Queue Length 95th (m)	0.9	87.3	10.2	35.2	19.4	0.0		1.7
Internal Link Dist (m)		82.1		668.4		114.4		99.1
Turn Bay Length (m)	15.0		30.0					
Base Capacity (vph)	513	938	528	1276	482	876		545
Starvation Cap Reductn	0	0	0	0	0	0		0
Spillback Cap Reductn	0	0	0	0	0	0		0
Storage Cap Reductn	0	0	0	0	0	0		0
Reduced v/c Ratio	0.00	0.56	0.19	0.29	0.15	0.16		0.00

## Intersection Summary

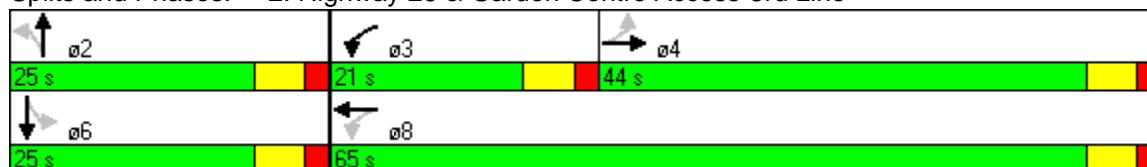
Cycle Length: 90

Actuated Cycle Length: 65.6

Natural Cycle: 60

Control Type: Semi Act-Uncoord




















Splits and Phases: 2: Highway 26 &amp; Garden Centre Access-3rd Line



## HCM Signalized Intersection Capacity Analysis

### 2: Highway 26 & Garden Centre Access-3rd Line










Future (2038) Total AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.85			0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.98	
Satd. Flow (prot)	1789	1856		1789	1883		1789	1601			1713	
Flt Permitted	0.54	1.00		0.19	1.00		0.76	1.00			0.92	
Satd. Flow (perm)	1018	1856		364	1883		1425	1601			1623	
Volume (vph)	1	433	47	92	341	0	67	0	127	1	0	1
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	471	51	100	371	0	73	0	138	1	0	1
RTOR Reduction (vph)	0	5	0	0	0	0	0	92	0	0	1	0
Lane Group Flow (vph)	1	517	0	100	371	0	73	46	0	0	1	0
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	22.9	22.9		34.5	34.5		20.1	20.1			20.1	
Effective Green, g (s)	24.9	24.9		36.5	36.5		22.1	22.1			22.1	
Actuated g/C Ratio	0.37	0.37		0.55	0.55		0.33	0.33			0.33	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	381	694		362	1032		473	531			539	
v/s Ratio Prot		c0.28		0.03	c0.20			0.03				
v/s Ratio Perm	0.00			0.12			c0.05				0.00	
v/c Ratio	0.00	0.74		0.28	0.36		0.15	0.09			0.00	
Uniform Delay, d1	13.1	18.1		9.7	8.5		15.7	15.3			14.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	4.4		0.4	0.2		0.7	0.3			0.0	
Delay (s)	13.1	22.4		10.1	8.7		16.4	15.6			14.9	
Level of Service	B	C		B	A		B	B			B	
Approach Delay (s)		22.4			9.0			15.9			14.9	
Approach LOS		C			A			B			B	
<b>Intersection Summary</b>												
HCM Average Control Delay			16.0			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			66.6			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			48.6%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Unsignalized Intersection Capacity Analysis

## 3: Sideroad 7 & 3rd Line

















Future (2038) Total AM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	42	0	7	22	15	51
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	0	8	24	16	55
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	83	44	72			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	83	44	72			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	100	100			
cM capacity (veh/h)	914	1026	1528			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	46	32	72			
Volume Left	46	8	0			
Volume Right	0	0	55			
cSH	914	1528	1700			
Volume to Capacity	0.05	0.00	0.04			
Queue Length 95th (m)	1.2	0.1	0.0			
Control Delay (s)	9.1	1.8	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.1	1.8	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		3.2				
Intersection Capacity Utilization		17.3%		ICU Level of Service		A
Analysis Period (min)		15				





















# HCM Unsignalized Intersection Capacity Analysis 4: Sideroad 7 & Grey County 7

Future (2038) Total AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	5	9	29	10	15	9	73	24	13	80	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	5	10	32	11	16	10	79	26	14	87	1
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	249	241	88	240	228	92	88			105		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	249	241	88	240	228	92	88			105		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	99	95	98	98	99			99		
cM capacity (veh/h)	675	650	971	694	661	965	1508			1486		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	18	59	115	102								
Volume Left	3	32	10	14								
Volume Right	10	16	26	1								
cSH	794	745	1508	1486								
Volume to Capacity	0.02	0.08	0.01	0.01								
Queue Length 95th (m)	0.5	1.9	0.1	0.2								
Control Delay (s)	9.6	10.2	0.7	1.1								
Lane LOS	A	B	A	A								
Approach Delay (s)	9.6	10.2	0.7	1.1								
Approach LOS	A	B										
Intersection Summary												
Average Delay			3.3									
Intersection Capacity Utilization		21.8%		ICU Level of Service		A						
Analysis Period (min)		15										










# HCM Unsignalized Intersection Capacity Analysis 5: Sideroad 10 & Site Access 2 & 3rd Line

Future (2038) Total AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	23	0	78	5	64	25	55	57	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	25	0	85	5	70	27	60	62	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	349	291	64	276	280	83	66			97		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	349	291	64	276	280	83	66			97		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	96	100	91	100			96		
cM capacity (veh/h)	535	592	1000	654	601	976	1535			1497		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	0	110	5	97	60	66						
Volume Left	0	25	5	0	60	0						
Volume Right	0	85	0	27	0	4						
cSH	1700	878	1535	1700	1497	1700						
Volume to Capacity	0.00	0.13	0.00	0.06	0.04	0.04						
Queue Length 95th (m)	0.0	3.2	0.1	0.0	0.9	0.0						
Control Delay (s)	0.0	9.7	7.4	0.0	7.5	0.0						
Lane LOS	A	A	A		A							
Approach Delay (s)	0.0	9.7	0.4		3.6							
Approach LOS	A	A										
Intersection Summary												
Average Delay			4.6									
Intersection Capacity Utilization			22.5%			ICU Level of Service			A			
Analysis Period (min)			15									











# HCM Unsignalized Intersection Capacity Analysis 6: Site Access 3 & 3rd Line

Future (2038) Total AM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	14	41	52	12	30	50
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	45	57	13	33	54
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	183	63			70	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	183	63			70	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	96			98	
cM capacity (veh/h)	790	1002			1531	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	60	70	87			
Volume Left	15	0	33			
Volume Right	45	13	0			
cSH	937	1700	1531			
Volume to Capacity	0.06	0.04	0.02			
Queue Length 95th (m)	1.6	0.0	0.5			
Control Delay (s)	9.1	0.0	2.9			
Lane LOS	A		A			
Approach Delay (s)	9.1	0.0	2.9			
Approach LOS	A					
Intersection Summary						
Average Delay		3.7				
Intersection Capacity Utilization		21.0%		ICU Level of Service		A
Analysis Period (min)		15				

# HCM Unsignalized Intersection Capacity Analysis 7: Site Access 2 & 3rd Line




















Future (2038) Total AM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free		Free	Free
Grade	0%		0%			0%
Volume (veh/h)	18	58	128	14	43	97
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	63	139	15	47	105
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	346	147			154	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	346	147			154	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	93			97	
cM capacity (veh/h)	630	900			1426	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	83	154	47	105		
Volume Left	20	0	47	0		
Volume Right	63	15	0	0		
cSH	817	1700	1426	1700		
Volume to Capacity	0.10	0.09	0.03	0.06		
Queue Length 95th (m)	2.6	0.0	0.8	0.0		
Control Delay (s)	9.9	0.0	7.6	0.0		
Lane LOS	A		A			
Approach Delay (s)	9.9	0.0	2.3			
Approach LOS	A					
Intersection Summary						
Average Delay		3.0				
Intersection Capacity Utilization		25.5%		ICU Level of Service		A
Analysis Period (min)		15				

## Queues

Future (2038) Total PM

## 1: Highway 26-McKibbin Drive &amp; St Vincent Street-Grey County 7

												
Lane Group	EBL2	EBL	NBL2	NBL	NBT	NBR	SBL	SBT	SEL	SET	NWL2	NWL
Lane Configurations												
Volume (vph)	1	1	2	92	80	15	131	66	8	712	15	6
Lane Group Flow (vph)	0	10	0	0	189	16	0	224	9	804	0	23
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm		Perm	Perm
Protected Phases		9			2			6		4		
Permitted Phases	9		2	2		2	6		4		8	8
Detector Phases	9	9	2	2	2	2	6	6	4	4	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	22.0	22.0	35.0	35.0	35.0	35.0	35.0	35.0	63.0	63.0	63.0	63.0
Total Split (%)	18.3%	18.3%	29.2%	29.2%	29.2%	29.2%	29.2%	29.2%	52.5%	52.5%	52.5%	52.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio		0.09			0.32	0.02		0.51	0.14	0.87		0.29
Control Delay		42.8			26.7	10.9		32.4	23.6	39.3		30.8
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay		42.8			26.7	10.9		32.4	23.6	39.3		30.8
Queue Length 50th (m)		1.4			28.2	0.0		36.6	1.1	163.4		3.1
Queue Length 95th (m)		6.8			55.6	5.0		73.4	5.0	#241.5		11.0
Internal Link Dist (m)		68.1			4538.6			763.0		331.6		
Turn Bay Length (m)												
Base Capacity (vph)		247			583	681		436	63	921		78
Starvation Cap Reductn		0			0	0		0	0	0		0
Spillback Cap Reductn		0			0	0		0	0	0		0
Storage Cap Reductn		0			0	0		0	0	0		0
Reduced v/c Ratio		0.04			0.32	0.02		0.51	0.14	0.87		0.29

## Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 120

Control Type: Actuated-Coordinated

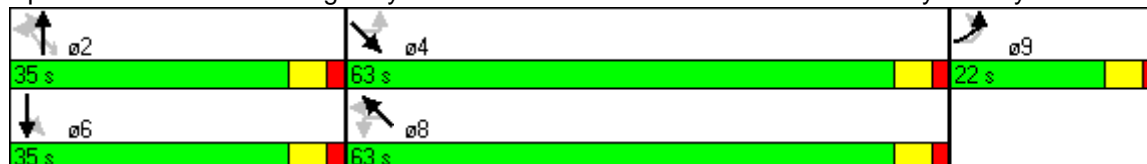
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Highway 26-McKibbin Drive &amp; St Vincent Street-Grey County 7



















## 1: Highway 26-McKibbin Drive &amp; St Vincent Street-Grey County 7



Lane Group	NWT
Lane Configurations	P
Volume (vph)	866
Lane Group Flow (vph)	970
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	8
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	63.0
Total Split (%)	52.5%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	1.05
Control Delay	74.5
Queue Delay	0.0
Total Delay	74.5
Queue Length 50th (m)	~249.2
Queue Length 95th (m)	#327.0
Internal Link Dist (m)	393.4
Turn Bay Length (m)	
Base Capacity (vph)	923
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	1.05
Intersection Summary	













HCM Signalized Intersection Capacity Analysis  
1: Highway 26-McKibbin Drive & St Vincent Street-Grey County 7

Future (2038) Total PM

												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SBR2
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0		4.0		
Lane Util. Factor		1.00					1.00	1.00		1.00		
Frt		0.89					1.00	0.85		0.99		
Flt Protected		0.99					0.97	1.00		0.97		
Satd. Flow (prot)		1663					1834	1601		1815		
Flt Permitted		0.92					0.74	1.00		0.64		
Satd. Flow (perm)		1553					1397	1601		1190		
Volume (vph)	1	1	4	4	2	92	80	15	131	66	3	6
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	4	4	2	100	87	16	142	72	3	7
RTOR Reduction (vph)	0	4	0	0	0	0	0	10	0	1	0	0
Lane Group Flow (vph)	0	6	0	0	0	0	189	6	0	223	0	0
Turn Type	Perm				Perm		Perm	Perm	Perm	Perm		
Protected Phases	9						2				6	
Permitted Phases	9				2	2		2	6			
Actuated Green, G (s)		1.5					43.5	43.5		43.5		
Effective Green, g (s)		3.5					45.5	45.5		45.5		
Actuated g/C Ratio		0.03					0.38	0.38		0.38		
Clearance Time (s)		6.0					6.0	6.0		6.0		
Vehicle Extension (s)		3.0					3.0	3.0		3.0		
Lane Grp Cap (vph)		45					530	607		451		
v/s Ratio Prot												
v/s Ratio Perm		c0.00					0.14	0.00		c0.19		
v/c Ratio		0.14					0.36	0.01		0.50		
Uniform Delay, d1		56.8					26.7	23.2		28.5		
Progression Factor		1.00					1.00	1.00		1.00		
Incremental Delay, d2		1.4					1.9	0.0		3.9		
Delay (s)		58.2					28.6	23.2		32.3		
Level of Service		E					C	C		C		
Approach Delay (s)		58.2					28.2			32.3		
Approach LOS		E					C			C		
<b>Intersection Summary</b>												
HCM Average Control Delay		51.5					HCM Level of Service			D		
HCM Volume to Capacity ratio		0.79										
Actuated Cycle Length (s)		120.0					Sum of lost time (s)			12.0		
Intersection Capacity Utilization		78.5%					ICU Level of Service			D		
Analysis Period (min)		15										
c Critical Lane Group												

















HCM Signalized Intersection Capacity Analysis  
 1: Highway 26-McKibbin Drive & St Vincent Street-Grey County 7

Future (2038) Total PM

								
Movement	SEL	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations								
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0				4.0	4.0	
Lane Util. Factor	1.00	1.00				1.00	1.00	
Frt	1.00	0.99				1.00	1.00	
Flt Protected	0.95	1.00				0.95	1.00	
Satd. Flow (prot)	1789	1873				1789	1875	
Flt Permitted	0.07	1.00				0.08	1.00	
Satd. Flow (perm)	128	1873				159	1875	
Volume (vph)	8	712	21	6	15	6	866	27
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	774	23	7	16	7	941	29
RTOR Reduction (vph)	0	1	0	0	0	0	1	0
Lane Group Flow (vph)	9	803	0	0	0	23	969	0
Turn Type	Perm					Perm	Perm	
Protected Phases		4					8	
Permitted Phases	4				8	8		
Actuated Green, G (s)	57.0	57.0				57.0	57.0	
Effective Green, g (s)	59.0	59.0				59.0	59.0	
Actuated g/C Ratio	0.49	0.49				0.49	0.49	
Clearance Time (s)	6.0	6.0				6.0	6.0	
Vehicle Extension (s)	3.0	3.0				3.0	3.0	
Lane Grp Cap (vph)	63	921				78	922	
v/s Ratio Prot		0.43					c0.52	
v/s Ratio Perm	0.07					0.14		
v/c Ratio	0.14	0.87				0.29	1.05	
Uniform Delay, d1	16.7	27.1				18.1	30.5	
Progression Factor	1.00	1.00				1.00	1.00	
Incremental Delay, d2	1.0	9.1				2.1	43.9	
Delay (s)	17.7	36.3				20.2	74.4	
Level of Service	B	D				C	E	
Approach Delay (s)		36.1					73.2	
Approach LOS		D					E	
Intersection Summary								



## 2: Highway 26 &amp; Garden Centre Access-3rd Line

								
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	1	531	187	631	89	0	1	0
Lane Group Flow (vph)	1	673	203	687	97	182	0	1
Turn Type	Perm		pm+pt		Perm		Perm	
Protected Phases		4	3	8		2		6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	3	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	10.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	45.0	45.0	19.0	64.0	26.0	26.0	26.0	26.0
Total Split (%)	50.0%	50.0%	21.1%	71.1%	28.9%	28.9%	28.9%	28.9%
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
Lead/Lag	Lag	Lag	Lead					
Lead-Lag Optimize?	Yes	Yes	Yes					
Recall Mode	None	None	None	None	Max	Max	Max	Max
v/c Ratio	0.00	0.85	0.53	0.59	0.24	0.24		0.00
Control Delay	13.0	32.2	12.9	11.2	27.5	0.7		25.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	13.0	32.2	12.9	11.2	27.5	0.7		25.0
Queue Length 50th (m)	0.1	86.2	11.7	54.9	12.0	0.0		0.1
Queue Length 95th (m)	0.9	#141.6	24.8	81.1	26.8	0.0		1.3
Internal Link Dist (m)		82.1		668.4		114.4		99.1
Turn Bay Length (m)	15.0		30.0					
Base Capacity (vph)	361	881	436	1255	400	757		283
Starvation Cap Reductn	0	0	0	0	0	0		0
Spillback Cap Reductn	0	0	0	0	0	0		0
Storage Cap Reductn	0	0	0	0	0	0		0
Reduced v/c Ratio	0.00	0.76	0.47	0.55	0.24	0.24		0.00

## Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 79.7

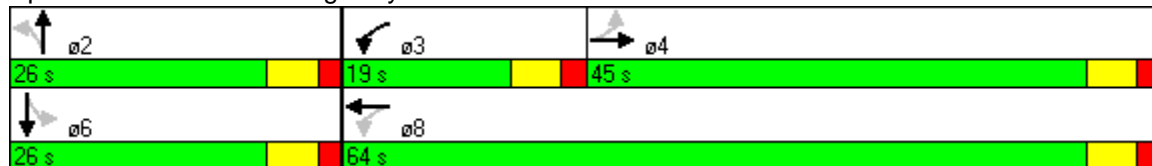
Natural Cycle: 60

Control Type: Semi Act-Uncoord

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.




















Splits and Phases: 2: Highway 26 &amp; Garden Centre Access-3rd Line



## HCM Signalized Intersection Capacity Analysis










### 2: Highway 26 & Garden Centre Access-3rd Line

Future (2038) Total PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.85			1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.95	
Satd. Flow (prot)	1789	1843		1789	1883		1789	1601			1789	
Flt Permitted	0.40	1.00		0.11	1.00		0.76	1.00			0.57	
Satd. Flow (perm)	760	1843		214	1883		1426	1601			1078	
Volume (vph)	1	531	88	187	631	1	89	0	167	1	0	0
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	577	96	203	686	1	97	0	182	1	0	0
RTOR Reduction (vph)	0	7	0	0	0	0	0	131	0	0	0	0
Lane Group Flow (vph)	1	666	0	203	687	0	97	51	0	0	1	0
Turn Type	Perm			pm+pt			Perm			Perm		
Protected Phases		4		3	8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	31.8	31.8		47.2	47.2		20.3	20.3			20.3	
Effective Green, g (s)	33.8	33.8		49.2	49.2		22.3	22.3			22.3	
Actuated g/C Ratio	0.43	0.43		0.62	0.62		0.28	0.28			0.28	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	323	784		358	1165		400	449			302	
v/s Ratio Prot		c0.36		0.08	c0.36			0.03				
v/s Ratio Perm	0.00			0.27			c0.07				0.00	
v/c Ratio	0.00	0.85		0.57	0.59		0.24	0.11			0.00	
Uniform Delay, d1	13.2	20.6		12.9	9.1		22.1	21.3			20.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	8.6		2.1	0.8		1.4	0.5			0.0	
Delay (s)	13.2	29.1		14.9	9.9		23.5	21.8			20.6	
Level of Service	B	C		B	A		C	C			C	
Approach Delay (s)		29.1			11.0			22.4			20.6	
Approach LOS		C			B			C			C	
<b>Intersection Summary</b>												
HCM Average Control Delay			19.4			HCM Level of Service				B		
HCM Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			79.5			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			64.0%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Unsignalized Intersection Capacity Analysis 3: Sideroad 7 & 3rd Line

















Future (2038) Total PM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	62	2	0	14	21	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	67	2	0	15	23	63
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	70	54	86			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	70	54	86			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	100	100			
cM capacity (veh/h)	935	1013	1510			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	70	15	86			
Volume Left	67	0	0			
Volume Right	2	0	63			
cSH	937	1510	1700			
Volume to Capacity	0.07	0.00	0.05			
Queue Length 95th (m)	1.8	0.0	0.0			
Control Delay (s)	9.1	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	9.1	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		3.7				
Intersection Capacity Utilization		14.9%		ICU Level of Service		A
Analysis Period (min)		15				

# HCM Unsignalized Intersection Capacity Analysis



















## 4: Sideroad 7 & Grey County 7

Future (2038) Total PM

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Sign Control		Stop			Stop			Free			Free		
Grade		0%			0%			0%			0%		
Volume (veh/h)	3	7	0	29	9	21	3	55	33	21	57	4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	3	8	0	32	10	23	3	60	36	23	62	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	222	212	64	198	196	78	66			96			
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	222	212	64	198	196	78	66			96			
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1			
tC, 2 stage (s)													
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2			
p0 queue free %	100	99	100	96	99	98	100			98			
cM capacity (veh/h)	700	674	1000	744	687	983	1535			1498			
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	11	64	99	89									
Volume Left	3	32	3	23									
Volume Right	0	23	36	4									
cSH	681	804	1535	1498									
Volume to Capacity	0.02	0.08	0.00	0.02									
Queue Length 95th (m)	0.4	2.0	0.0	0.4									
Control Delay (s)	10.4	9.9	0.3	2.0									
Lane LOS	B	A	A	A									
Approach Delay (s)	10.4	9.9	0.3	2.0									
Approach LOS	B	A											
Intersection Summary													
Average Delay			3.6										
Intersection Capacity Utilization		23.3%		ICU Level of Service		A							
Analysis Period (min)		15											










# HCM Unsignalized Intersection Capacity Analysis 5: Sideroad 10 & Site Access 2 & 3rd Line

Future (2038) Total PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	27	0	89	0	91	28	101	87	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	29	0	97	0	99	30	110	95	2
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	511	445	96	428	430	114	97			129		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	511	445	96	428	430	114	97			129		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	94	100	90	100			92		
cM capacity (veh/h)	400	470	961	506	478	938	1497			1456		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	0	126	0	129	110	97						
Volume Left	0	29	0	0	110	0						
Volume Right	0	97	0	30	0	2						
cSH	1700	783	1700	1700	1456	1700						
Volume to Capacity	0.00	0.16	0.00	0.08	0.08	0.06						
Queue Length 95th (m)	0.0	4.3	0.0	0.0	1.9	0.0						
Control Delay (s)	0.0	10.5	0.0	0.0	7.7	0.0						
Lane LOS	A	B			A							
Approach Delay (s)	0.0	10.5	0.0		4.1							
Approach LOS	A	B										
Intersection Summary												
Average Delay			4.7									
Intersection Capacity Utilization		25.9%		ICU Level of Service				A				
Analysis Period (min)		15										











# HCM Unsignalized Intersection Capacity Analysis 6: Site Access 3 & 3rd Line

Future (2038) Total PM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	15	51	61	15	57	57
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	55	66	16	62	62
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	260	74			83	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	260	74			83	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	98	94			96	
cM capacity (veh/h)	699	987			1515	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	72	83	124			
Volume Left	16	0	62			
Volume Right	55	16	0			
cSH	902	1700	1515			
Volume to Capacity	0.08	0.05	0.04			
Queue Length 95th (m)	2.0	0.0	1.0			
Control Delay (s)	9.3	0.0	3.9			
Lane LOS	A		A			
Approach Delay (s)	9.3	0.0	3.9			
Approach LOS	A					
Intersection Summary						
Average Delay		4.1				
Intersection Capacity Utilization		23.5%		ICU Level of Service		A
Analysis Period (min)		15				

# HCM Unsignalized Intersection Capacity Analysis 7: Site Access 2 & 3rd Line

Future (2038) Total PM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free		Free	Free
Grade	0%		0%			0%
Volume (veh/h)	25	83	153	27	95	165
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	90	166	29	103	179
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	567	181			196	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	567	181			196	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	90			93	
cM capacity (veh/h)	449	862			1377	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	117	196	103	179		
Volume Left	27	0	103	0		
Volume Right	90	29	0	0		
cSH	710	1700	1377	1700		
Volume to Capacity	0.17	0.12	0.07	0.11		
Queue Length 95th (m)	4.5	0.0	1.8	0.0		
Control Delay (s)	11.1	0.0	7.8	0.0		
Lane LOS	B		A			
Approach Delay (s)	11.1	0.0	2.9			
Approach LOS	B					
Intersection Summary						
Average Delay		3.5				
Intersection Capacity Utilization		31.5%		ICU Level of Service		A
Analysis Period (min)		15				

## Queues

Future (2038) Total SAT

## 1: Highway 26-McKibbon Drive &amp; St Vincent Street-Grey County 7



Lane Group	EBL2	EBL	NBL2	NBL	NBT	NBR	SBL	SBT	SEL	SET	NWL2	NWL
Lane Configurations												
Volume (vph)	1	1	2	109	40	8	71	64	4	547	1	5
Lane Group Flow (vph)	0	14	0	0	163	9	0	149	4	655	0	6
Turn Type	Perm		Perm	Perm		Perm	Perm		Perm		Perm	Perm
Protected Phases		9			2			6		4		
Permitted Phases	9		2	2		2	6		4		8	8
Detector Phases	9	9	2	2	2	2	6	6	4	4	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
Total Split (s)	26.0	26.0	33.0	33.0	33.0	33.0	33.0	33.0	61.0	61.0	61.0	61.0
Total Split (%)	21.7%	21.7%	27.5%	27.5%	27.5%	27.5%	27.5%	27.5%	50.8%	50.8%	50.8%	50.8%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	None	None	None	None
v/c Ratio		0.12			0.26	0.01		0.24	0.02	0.89		0.04
Control Delay		38.8			23.4	13.4		23.0	18.2	48.8		19.3
Queue Delay		0.0			0.0	0.0		0.0	0.0	0.0		0.0
Total Delay		38.8			23.4	13.4		23.0	18.2	48.8		19.3
Queue Length 50th (m)		1.6			19.9	0.0		18.0	0.6	140.3		0.9
Queue Length 95th (m)		8.1			47.9	3.6		43.8	2.5	168.2		3.2
Internal Link Dist (m)		68.1			4538.6			763.0		331.6		
Turn Bay Length (m)												
Base Capacity (vph)		305			622	797		632	265	882		163
Starvation Cap Reductn		0			0	0		0	0	0		0
Spillback Cap Reductn		0			0	0		0	0	0		0
Storage Cap Reductn		0			0	0		0	0	0		0
Reduced v/c Ratio		0.05			0.26	0.01		0.24	0.02	0.74		0.04

## Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Splits and Phases: 1: Highway 26-McKibbon Drive &amp; St Vincent Street-Grey County 7

ø2	ø4	ø9
33 s	61 s	26 s
ø6	ø8	
33 s	61 s	



## 1: Highway 26-McKibbin Drive &amp; St Vincent Street-Grey County 7




















Lane Group	NWT
Lane Configurations	P
Volume (vph)	450
Lane Group Flow (vph)	516
Turn Type	
Protected Phases	8
Permitted Phases	
Detector Phases	8
Minimum Initial (s)	4.0
Minimum Split (s)	22.0
Total Split (s)	61.0
Total Split (%)	50.8%
Yellow Time (s)	4.0
All-Red Time (s)	2.0
Lead/Lag	
Lead-Lag Optimize?	
Recall Mode	None
v/c Ratio	0.70
Control Delay	34.7
Queue Delay	0.0
Total Delay	34.7
Queue Length 50th (m)	98.1
Queue Length 95th (m)	119.0
Internal Link Dist (m)	393.4
Turn Bay Length (m)	
Base Capacity (vph)	889
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.58
Intersection Summary	

# HCM Signalized Intersection Capacity Analysis

Future (2038) Total SAT

## 1: Highway 26-McKibbin Drive & St Vincent Street-Grey County 7

												
Movement	EBL2	EBL	EBR	EBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SEL
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0					4.0	4.0		4.0		4.0
Lane Util. Factor		1.00					1.00	1.00		1.00		1.00
Frt		0.88					1.00	0.85		1.00		1.00
Flt Protected		0.99					0.96	1.00		0.97		0.95
Satd. Flow (prot)		1654					1817	1601		1833		1789
Flt Permitted		0.95					0.72	1.00		0.79		0.22
Satd. Flow (perm)		1579					1352	1601		1477		418
Volume (vph)	1	1	5	6	2	109	40	8	71	64	2	4
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	1	5	7	2	118	43	9	77	70	2	4
RTOR Reduction (vph)	0	7	0	0	0	0	0	5	0	0	0	0
Lane Group Flow (vph)	0	7	0	0	0	0	163	4	0	149	0	4
Turn Type	Perm				Perm	Perm		Perm	Perm			Perm
Protected Phases		9					2			6		
Permitted Phases	9				2	2		2	6			4
Actuated Green, G (s)		2.9					53.7	53.7		53.7		45.4
Effective Green, g (s)		4.9					55.7	55.7		55.7		47.4
Actuated g/C Ratio		0.04					0.46	0.46		0.46		0.39
Clearance Time (s)		6.0					6.0	6.0		6.0		6.0
Vehicle Extension (s)		3.0					3.0	3.0		3.0		3.0
Lane Grp Cap (vph)		64					628	743		686		165
v/s Ratio Prot												
v/s Ratio Perm		c0.00					c0.12	0.00		0.10		0.01
v/c Ratio		0.11					0.26	0.01		0.22		0.02
Uniform Delay, d1		55.5					19.6	17.3		19.2		22.2
Progression Factor		1.00					1.00	1.00		1.00		1.00
Incremental Delay, d2		0.8					1.0	0.0		0.7		0.1
Delay (s)		56.3					20.6	17.3		19.9		22.2
Level of Service		E					C	B		B		C
Approach Delay (s)		56.3					20.4			19.9		
Approach LOS		E					C			B		
<b>Intersection Summary</b>												
HCM Average Control Delay		36.6					HCM Level of Service			D		
HCM Volume to Capacity ratio		0.53										
Actuated Cycle Length (s)		120.0					Sum of lost time (s)			12.0		
Intersection Capacity Utilization		59.6%					ICU Level of Service			B		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis  
 1: Highway 26-McKibbin Drive & St Vincent Street-Grey County 7

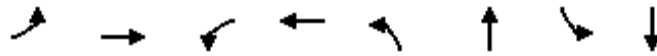
Future (2038) Total SAT



Movement	SET	SER	SER2	NWL2	NWL	NWT	NWR
Lane Configurations	PT				PT	PT	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0				4.0	4.0	
Lane Util. Factor	1.00				1.00	1.00	
Frt	0.99				1.00	0.99	
Flt Protected	1.00				0.95	1.00	
Satd. Flow (prot)	1858				1789	1869	
Flt Permitted	1.00				0.09	1.00	
Satd. Flow (perm)	1858				163	1869	
Volume (vph)	547	51	5	1	5	450	25
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	595	55	5	1	5	489	27
RTOR Reduction (vph)	0	0	0	0	0	2	0
Lane Group Flow (vph)	655	0	0	0	6	514	0
Turn Type				Perm	Perm		
Protected Phases	4					8	
Permitted Phases				8	8		
Actuated Green, G (s)	45.4				45.4	45.4	
Effective Green, g (s)	47.4				47.4	47.4	
Actuated g/C Ratio	0.39				0.39	0.39	
Clearance Time (s)	6.0				6.0	6.0	
Vehicle Extension (s)	3.0				3.0	3.0	
Lane Grp Cap (vph)	734				64	738	
v/s Ratio Prot	0.35					0.28	
v/s Ratio Perm					0.04		
v/c Ratio	0.89				0.09	0.70	
Uniform Delay, d1	33.9				22.8	30.3	
Progression Factor	1.00				1.00	1.00	
Incremental Delay, d2	13.2				0.6	2.9	
Delay (s)	47.1				23.4	33.2	
Level of Service	D				C	C	
Approach Delay (s)	46.9					33.1	
Approach LOS	D					C	

Intersection Summary

## 2: Highway 26 &amp; Garden Centre Access-3rd Line



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	4	509	169	521	103	0	1	0
Lane Group Flow (vph)	4	725	184	566	112	249	0	5
Turn Type	Perm		pm+pt		pm+pt		Perm	
Protected Phases		4	3	8	5	2		6
Permitted Phases	4		8		2		6	
Detector Phases	4	4	3	8	5	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0	10.0	22.0	10.0	22.0	22.0	22.0
Total Split (s)	44.0	44.0	11.0	55.0	11.0	35.0	24.0	24.0
Total Split (%)	48.9%	48.9%	12.2%	61.1%	12.2%	38.9%	26.7%	26.7%
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
Lead/Lag	Lag	Lag	Lead		Lead		Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes		Yes		Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	Max
v/c Ratio	0.01	0.91	0.82	0.54	0.22	0.32		0.01
Control Delay	14.2	40.7	45.3	14.7	22.1	2.1		19.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay	14.2	40.7	45.3	14.7	22.1	2.1		19.2
Queue Length 50th (m)	0.4	108.3	15.6	56.5	13.4	0.0		0.1
Queue Length 95th (m)	2.2	#178.4	#50.7	83.7	25.2	6.4		2.9
Internal Link Dist (m)		82.1		668.4		114.4		99.1
Turn Bay Length (m)	15.0		30.0					
Base Capacity (vph)	351	819	224	1067	501	771		410
Starvation Cap Reductn	0	0	0	0	0	0		0
Spillback Cap Reductn	0	0	0	0	0	0		0
Storage Cap Reductn	0	0	0	0	0	0		0
Reduced v/c Ratio	0.01	0.89	0.82	0.53	0.22	0.32		0.01

## Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 87.9

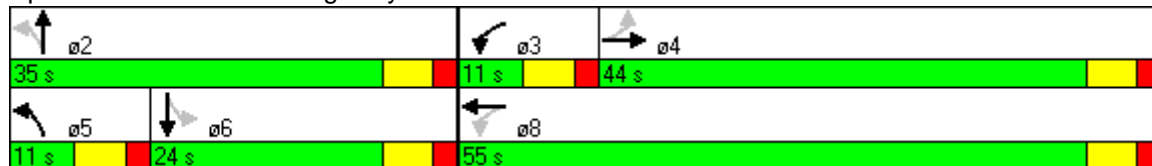
Natural Cycle: 80

Control Type: Semi Act-Uncoord

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.




















## Splits and Phases: 2: Highway 26 &amp; Garden Centre Access-3rd Line



## HCM Signalized Intersection Capacity Analysis

### 2: Highway 26 & Garden Centre Access-3rd Line










Future (2038) Total SAT

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.96		1.00	1.00		1.00	0.85			0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1789	1816		1789	1883		1789	1601			1663	
Flt Permitted	0.41	1.00		0.10	1.00		0.72	1.00			0.95	
Satd. Flow (perm)	771	1816		180	1883		1364	1601			1602	
Volume (vph)	4	509	158	169	521	0	103	0	229	1	0	4
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	553	172	184	566	0	112	0	249	1	0	4
RTOR Reduction (vph)	0	13	0	0	0	0	0	159	0	0	3	0
Lane Group Flow (vph)	4	712	0	184	566	0	112	90	0	0	2	0
Turn Type	Perm			pm+pt			pm+pt			Perm		
Protected Phases		4		3	8		5	2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	35.8	35.8		46.8	46.8		30.4	30.4			20.5	
Effective Green, g (s)	37.8	37.8		48.8	48.8		32.4	32.4			22.5	
Actuated g/C Ratio	0.42	0.42		0.55	0.55		0.36	0.36			0.25	
Clearance Time (s)	6.0	6.0		6.0	6.0		6.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	327	770		225	1030		524	582			404	
v/s Ratio Prot		c0.39		c0.06	0.30		c0.01	0.06				
v/s Ratio Perm	0.01			0.38			c0.06				0.00	
v/c Ratio	0.01	0.93		0.82	0.55		0.21	0.16			0.00	
Uniform Delay, d1	14.9	24.4		18.8	13.1		19.4	19.2			25.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0	16.8		20.1	0.6		0.2	0.6			0.0	
Delay (s)	14.9	41.2		38.9	13.7		19.6	19.7			25.0	
Level of Service	B	D		D	B		B	B			C	
Approach Delay (s)		41.0			19.9			19.7			25.0	
Approach LOS		D			B			B			C	
<b>Intersection Summary</b>												
HCM Average Control Delay			28.2			HCM Level of Service				C		
HCM Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			89.2			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			69.9%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Unsignalized Intersection Capacity Analysis

## 3: Sideroad 7 & 3rd Line

















Future (2038) Total SAT

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	100	5	0	20	31	91
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	109	5	0	22	34	99
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	105	83	133			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	105	83	133			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	99	100			
cM capacity (veh/h)	893	976	1452			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	114	22	133			
Volume Left	109	0	0			
Volume Right	5	0	99			
cSH	897	1452	1700			
Volume to Capacity	0.13	0.00	0.08			
Queue Length 95th (m)	3.3	0.0	0.0			
Control Delay (s)	9.6	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	9.6	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		4.1				
Intersection Capacity Utilization		19.7%		ICU Level of Service		A
Analysis Period (min)		15				

# HCM Unsignalized Intersection Capacity Analysis



















## 4: Sideroad 7 & Grey County 7

Future (2038) Total SAT

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	6	13	3	51	15	27	6	110	33	48	95	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	14	3	55	16	29	7	120	36	52	103	10
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	401	381	108	373	368	138	113			155		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	401	381	108	373	368	138	113			155		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	97	100	90	97	97	100			96		
cM capacity (veh/h)	513	529	946	552	538	911	1476			1425		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	24	101	162	165								
Volume Left	7	55	7	52								
Volume Right	3	29	36	10								
cSH	558	620	1476	1425								
Volume to Capacity	0.04	0.16	0.00	0.04								
Queue Length 95th (m)	1.0	4.4	0.1	0.9								
Control Delay (s)	11.7	11.9	0.3	2.6								
Lane LOS	B	B	A	A								
Approach Delay (s)	11.7	11.9	0.3	2.6								
Approach LOS	B	B										
Intersection Summary												
Average Delay			4.4									
Intersection Capacity Utilization			36.3%		ICU Level of Service					A		
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis 5: Sideroad 10 & Site Access 2 & 3rd Line










Future (2038) Total SAT

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	46	0	125	5	115	45	132	129	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	50	0	136	5	125	49	143	140	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	701	614	142	588	592	149	145			174		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	701	614	142	588	592	149	145			174		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	87	100	85	100			90		
cM capacity (veh/h)	276	364	905	387	375	897	1438			1403		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	0	186	5	174	143	145						
Volume Left	0	50	5	0	143	0						
Volume Right	0	136	0	49	0	4						
cSH	1700	662	1438	1700	1403	1700						
Volume to Capacity	0.00	0.28	0.00	0.10	0.10	0.09						
Queue Length 95th (m)	0.0	8.7	0.1	0.0	2.6	0.0						
Control Delay (s)	0.0	12.5	7.5	0.0	7.9	0.0						
Lane LOS	A	B	A		A							
Approach Delay (s)	0.0	12.5	0.2		3.9							
Approach LOS	A	B										
Intersection Summary												
Average Delay			5.4									
Intersection Capacity Utilization			36.4%		ICU Level of Service				A			
Analysis Period (min)			15									













# HCM Unsignalized Intersection Capacity Analysis 6: Site Access 3 & 3rd Line

Future (2038) Total SAT

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	24	68	97	23	70	105
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	74	105	25	76	114
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	384	118			130	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	384	118			130	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	92			95	
cM capacity (veh/h)	586	934			1455	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	100	130	190			
Volume Left	26	0	76			
Volume Right	74	25	0			
cSH	809	1700	1455			
Volume to Capacity	0.12	0.08	0.05			
Queue Length 95th (m)	3.2	0.0	1.3			
Control Delay (s)	10.1	0.0	3.3			
Lane LOS	B		A			
Approach Delay (s)	10.1	0.0	3.3			
Approach LOS	B					
Intersection Summary						
Average Delay		3.9				
Intersection Capacity Utilization		28.2%		ICU Level of Service		A
Analysis Period (min)		15				

# HCM Unsignalized Intersection Capacity Analysis 7: Site Access 2 & 3rd Line

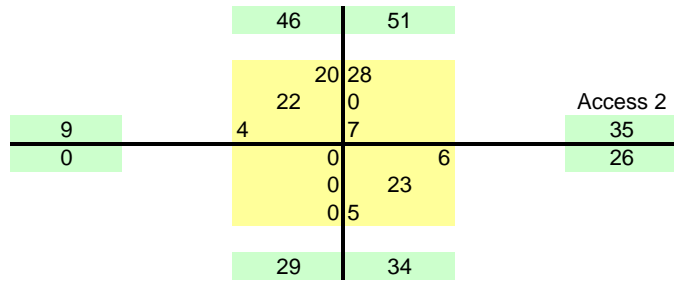
Future (2038) Total SAT

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free		Free	Free
Grade	0%		0%			0%
Volume (veh/h)	41	107	204	36	102	224
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	45	116	222	39	111	243
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	707	241			261	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	707	241			261	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	88	85			91	
cM capacity (veh/h)	368	798			1304	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	161	261	111	243		
Volume Left	45	0	111	0		
Volume Right	116	39	0	0		
cSH	602	1700	1304	1700		
Volume to Capacity	0.27	0.15	0.09	0.14		
Queue Length 95th (m)	8.1	0.0	2.1	0.0		
Control Delay (s)	13.1	0.0	8.0	0.0		
Lane LOS	B		A			
Approach Delay (s)	13.1	0.0	2.5			
Approach LOS	B					
Intersection Summary						
Average Delay			3.9			
Intersection Capacity Utilization		37.4%			ICU Level of Service	A
Analysis Period (min)		15				

**APPENDIX L**  
**Left Turn Warrants**

# FT 2017

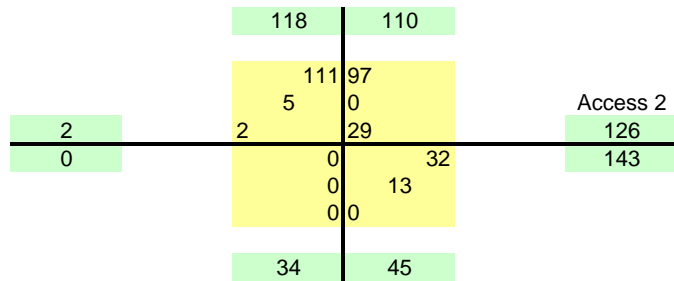
## AM - 3rd Line - Access 1



Design Speed 80  
 Advance Traffic Volume 46 VA  
 Opposing Traffic Volumes 34 VO  
 Left Turn Traffic Volume 20 VL

**Percentage of Left Turning Traffic 43%** NOT MET

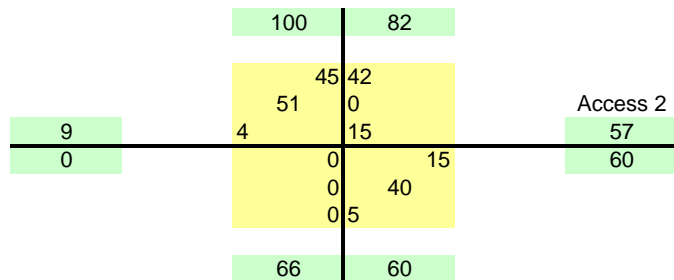
## PM - 3rd Line - Access 1



Design Speed 80  
 Advance Traffic Volume 118 VA  
 Opposing Traffic Volumes 45 VO  
 Left Turn Traffic Volume 111 VL

**Percentage of Left Turning Traffic 94%** NOT MET

## SAT - 3rd Line - Access 1



Design Speed 80  
 Advance Traffic Volume 100 VA  
 Opposing Traffic Volumes 60 VO  
 Left Turn Traffic Volume 45 VL

**Percentage of Left Turning Traffic 45%** NOT MET

BASED ON FIGURE EA-17 WITH VL >40%

# FT 2022

## AM - 3rd Line - Access 1

		77	88	
		46	65	
		27	0	
9	4	18	21	Access 2
0		0	23	83
		0	5	67
		45	49	

Design Speed 100  
 Advance Traffic Volume 77 VA  
 Opposing Traffic Volumes 49 VO  
 Left Turn Traffic Volume 46 VL

**Percentage of Left Turning Traffic 60%**

NOT MET

## PM - 3rd Line - Access 1

		185	169	
		178	156	
		5	0	
2	2	46	50	Access 2
0		0	13	202
		0	0	228
		51	63	

Design Speed 100  
 Advance Traffic Volume 185 VA  
 Opposing Traffic Volumes 63 VO  
 Left Turn Traffic Volume 178 VL

**Percentage of Left Turning Traffic 96%**

NOT MET

## SAT - 3rd Line - Access 1

		171	150	
		108	103	
		59	0	
9	4	37	36	Access 2
0		0	47	140
		0	5	144
		96	88	

Design Speed 100  
 Advance Traffic Volume 171 VA  
 Opposing Traffic Volumes 88 VO  
 Left Turn Traffic Volume 108 VL

**Percentage of Left Turning Traffic 63%**

NOT MET

# FT 2027

## AM - 3rd Line - Access 1

		116	142	
		55	78	
		57	0	
9	4	23	25	Access 2
0		0	64	101
		0	5	80
		80	94	

Design Speed 100  
 Advance Traffic Volume 116 VA  
 Opposing Traffic Volumes 94 VO  
 Left Turn Traffic Volume 55 VL

**Percentage of Left Turning Traffic 47%**

NOT MET

## PM - 3rd Line - Access 1

		260	235	
		178	156	
		80	0	
2	2	46	50	Access 2
0		0	79	202
		0	0	228
		126	129	

Design Speed 100  
 Advance Traffic Volume 260 VA  
 Opposing Traffic Volumes 129 VO  
 Left Turn Traffic Volume 178 VL

**Percentage of Left Turning Traffic 68%**

MET @ S = 15

## SAT - 3rd Line - Access 1

		265	240	
		132	125	
		129	0	
9	4	46	45	Access 2
0		0	115	171
		0	5	177
		175	165	

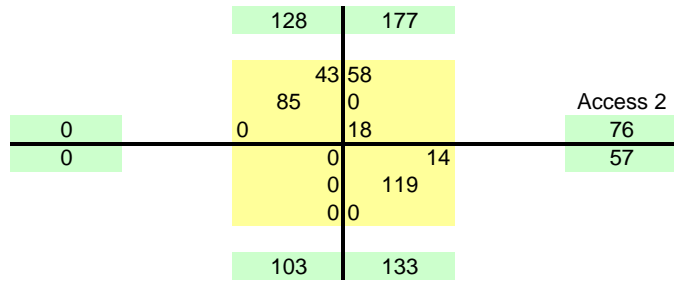
Design Speed 100  
 Advance Traffic Volume 265 VA  
 Opposing Traffic Volumes 165 VO  
 Left Turn Traffic Volume 132 VL

**Percentage of Left Turning Traffic 50%**

MET @ S = 15

# FT 2017

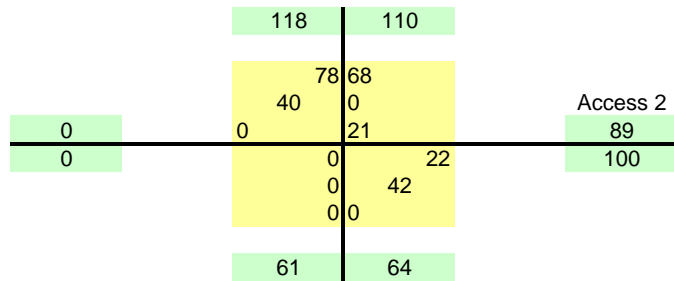
## AM - 3rd Line - Access 1



Design Speed	80	
Advance Traffic Volume	128	VA
Opposing Traffic Volumes	133	VO
Left Turn Traffic Volume	43	VL

**Percentage of Left Turning Traffic** **34%** NOT MET

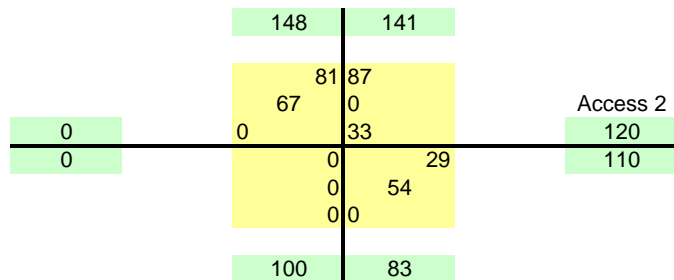
## PM - 3rd Line - Access 1



Design Speed	80	
Advance Traffic Volume	118	VA
Opposing Traffic Volumes	64	VO
Left Turn Traffic Volume	78	VL

**Percentage of Left Turning Traffic** **66%** NOT MET

## SAT - 3rd Line - Access 1



Design Speed	80	
Advance Traffic Volume	148	VA
Opposing Traffic Volumes	83	VO
Left Turn Traffic Volume	81	VL

**Percentage of Left Turning Traffic** **55%** NOT MET

BASED ON FIGURE EA-17 WITH VL >40%

# FT 2022

## AM - 3rd Line - Access 1

		101	132	
		43	58	
		58	0	
0	0	0	18	Access 2
0	0	0	14	76
		0	74	57
		0	0	
		76	88	

Design Speed 100  
Advance Traffic Volume 101 VA  
Opposing Traffic Volumes 88 VO  
Left Turn Traffic Volume 43 VL

**Percentage of Left Turning Traffic 43%**

NOT MET

## PM - 3rd Line - Access 1

		185	169	
		95	83	
		90	0	
0	0	0	25	Access 2
0	0	0	27	108
		0	86	122
		0	0	
		115	113	

Design Speed 100  
Advance Traffic Volume 185 VA  
Opposing Traffic Volumes 113 VO  
Left Turn Traffic Volume 95 VL

**Percentage of Left Turning Traffic 51%**

NOT MET

## SAT - 3rd Line - Access 1

		232	222	
		102	107	
		130	0	
0	0	0	41	Access 2
0	0	0	36	148
		0	115	138
		0	0	
		171	151	

Design Speed 100  
Advance Traffic Volume 232 VA  
Opposing Traffic Volumes 151 VO  
Left Turn Traffic Volume 102 VL

**Percentage of Left Turning Traffic 44%**

NOT MET



# FT 2027

## AM - 3rd Line - Access 1

		140	186	
		43	58	
		97	0	
0	0	0	18	Access 2
0	0	0	14	76
		0	128	
		0	0	
		115	142	

Design Speed 100  
Advance Traffic Volume 140 VA  
Opposing Traffic Volumes 142 VO  
Left Turn Traffic Volume 43 VL

**Percentage of Left Turning Traffic 31%**

NOT MET

## PM - 3rd Line - Access 1

		260	236	
		95	83	
		165	0	
0	0	0	25	Access 2
0	0	0	27	108
		0	153	
		0	0	
		190	180	

Design Speed 100  
Advance Traffic Volume 260 VA  
Opposing Traffic Volumes 180 VO  
Left Turn Traffic Volume 95 VL

**Percentage of Left Turning Traffic 37%**

NOT MET

## SAT - 3rd Line - Access 1

		326	312	
		102	107	
		224	0	
0	0	0	41	Access 2
0	0	0	36	148
		0	205	
		0	0	
		265	241	

Design Speed 100  
Advance Traffic Volume 326 VA  
Opposing Traffic Volumes 241 VO  
Left Turn Traffic Volume 102 VL

**Percentage of Left Turning Traffic 31%**

MET @ S = 15

## AM - Highway 26 - 3rd Line

			2	38	
			0	0	
			1	224	
			0	41	
262			0	0	265
311		1	0	54	340
			1	0	
			285	37	
			25	0	
			67	91	
	WB		NB	EB	
Design Speed	100		80		
Advance Traffic Volume	265	VA	91	311	
Opposing Traffic Volumes	311	VO	2	265	
Left Turn Traffic Volume	41	VL	37	1	
<b>Percentage of Left Turning Traffic</b>	<b>15%</b>		<b>41%</b>	<b>0%</b>	

15% Based on Appendix A Figure EA-23, left turn warrant met with a recommended storage of 15 m  
41% Based on Appendix A Figure EA-17, left turn warrant not met  
0% Based on Appendix A Figure EA-22, left turn warrant not met

## PM - Highway 26 - 3rd Line

			1	56	
			0	1	
			1	416	
			0	84	
470			0	0	501
400			0	76	427
			1	0	
			350	54	
			49	0	
			134	130	
	WB		NB	EB	
Design Speed	100		80		
Advance Traffic Volume	501	VA	130	400	
Opposing Traffic Volumes	400	VO	1	501	
Left Turn Traffic Volume	84	VL	54	1	
<b>Percentage of Left Turning Traffic</b>	<b>17%</b>		<b>42%</b>	<b>0%</b>	

17% Based on Appendix A Figure EA-22, left turn warrant met with a recommended storage of 25 m  
42% Based on Appendix A Figure EA-17, left turn warrant not met  
0% Based on Appendix A Figure EA-22, left turn warrant met with a recommended storage of 15 m

## SAT - Highway 26 - 3rd Line

			5	61	
			0	0	
			1	343	
			0	74	
404			0	0	417
415		4	0	104	441
			4	0	
			336	57	
			75	0	
			150	161	
	WB		NB	EB	
Design Speed	100		80		
Advance Traffic Volume	417	VA	161	415	
Opposing Traffic Volumes	415	VO	5	417	
Left Turn Traffic Volume	74	VL	57	4	
<b>Percentage of Left Turning Traffic</b>	<b>18%</b>		<b>35%</b>	<b>1%</b>	

18% Based on Appendix A Figure EA-23, left turn warrant met with a recommended storage of 25 m  
35% Based on Appendix A Figure EA-17, left turn warrant not met  
1% Based on Appendix A Figure EA-22, left turn warrant met with a recommended storage of 15 m

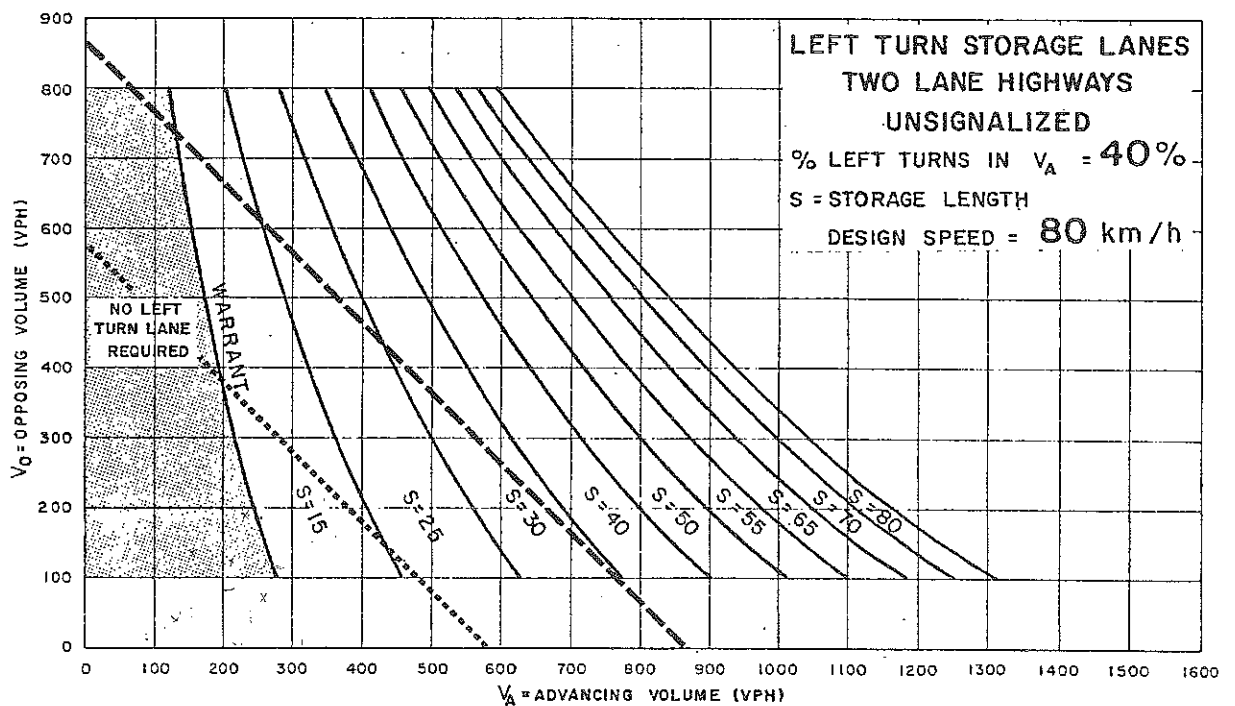
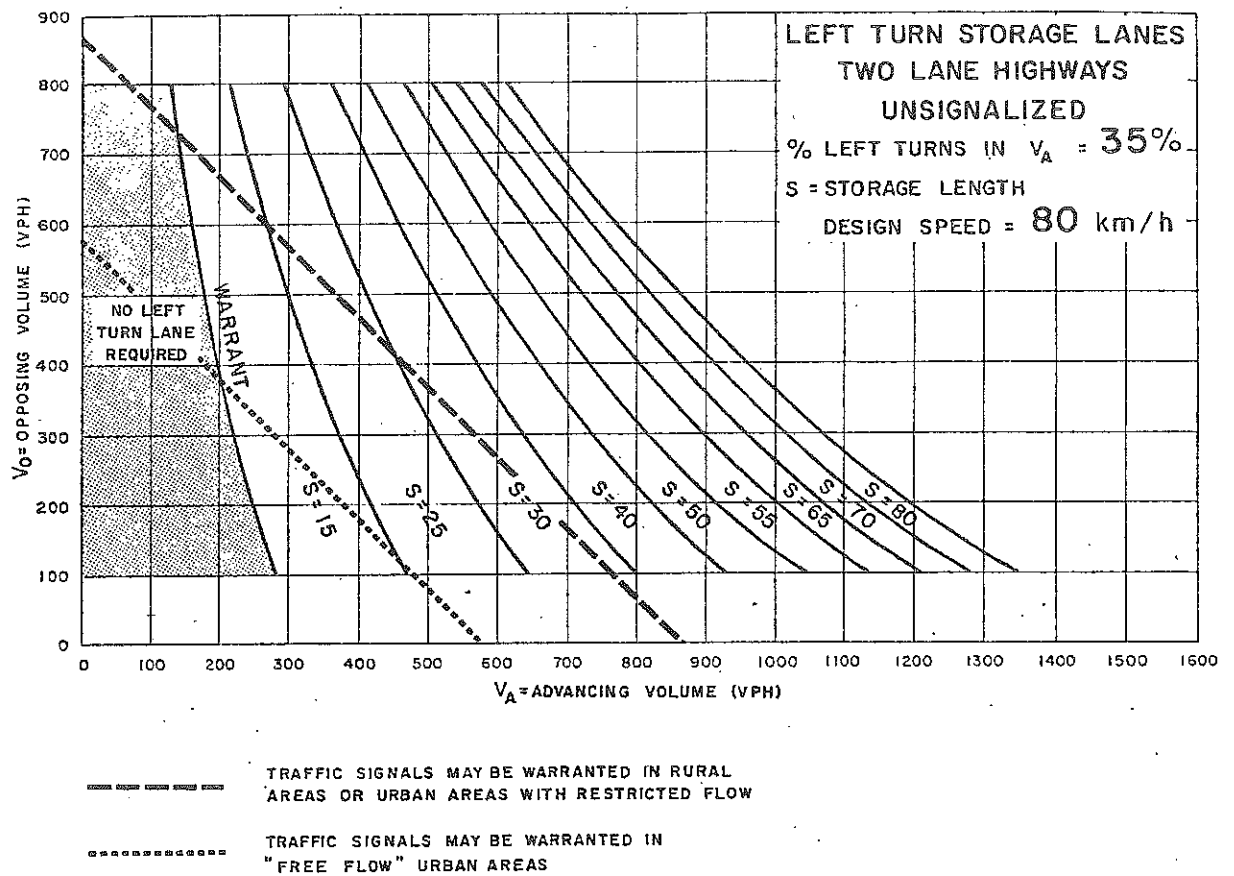


Figure EA-17

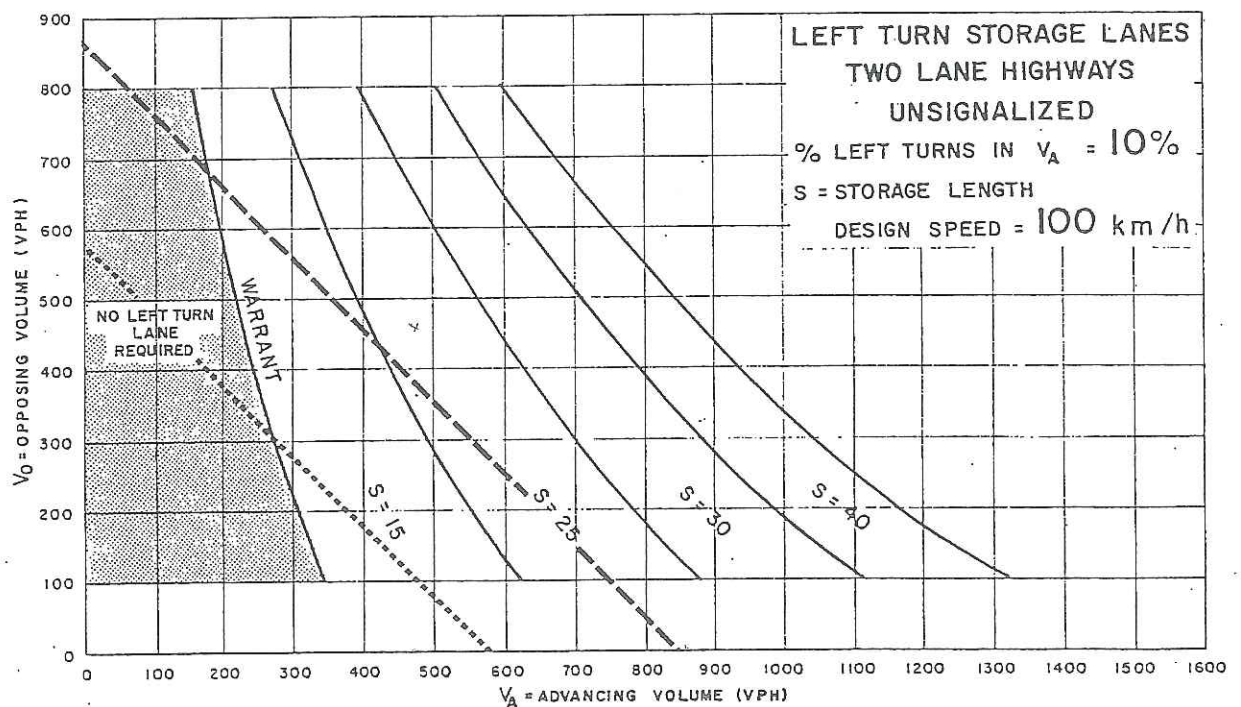
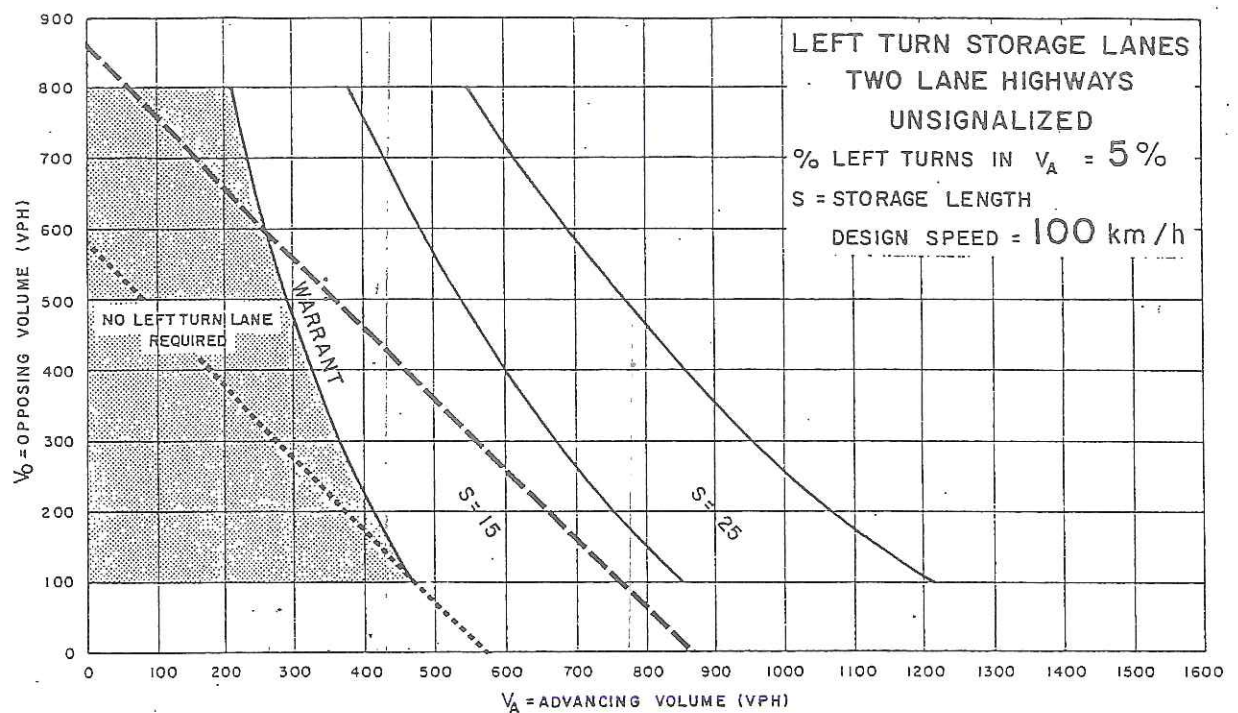


Figure EA-22

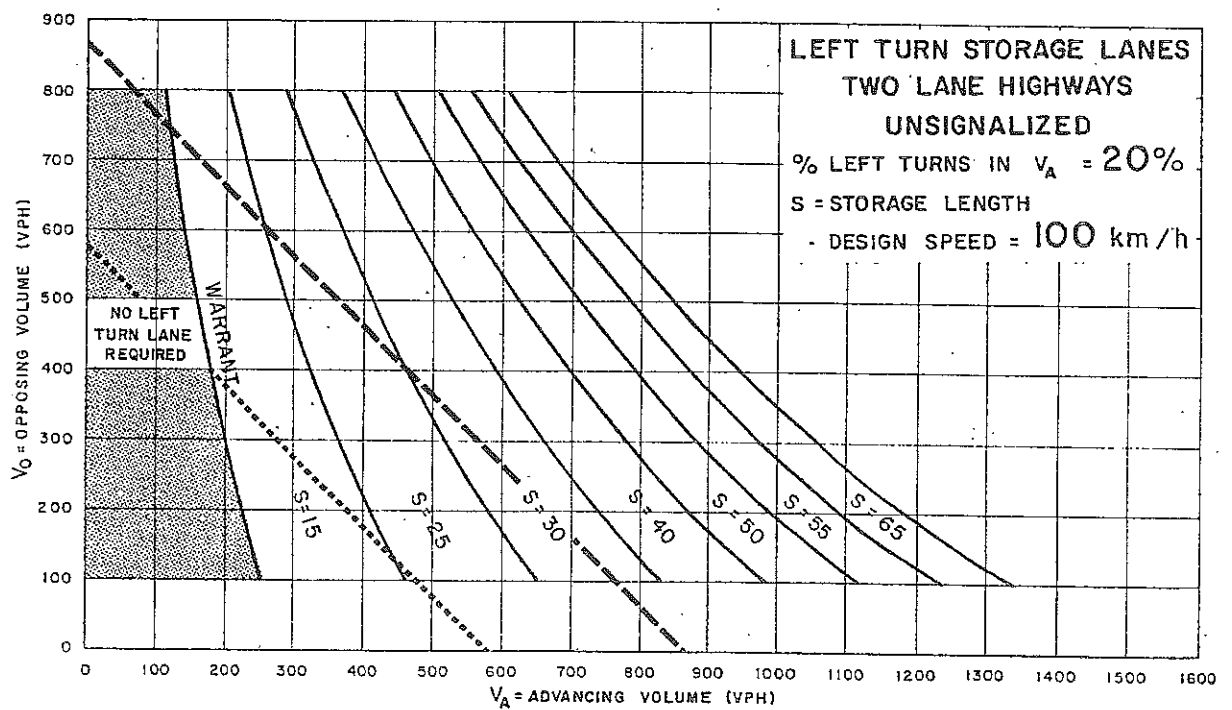
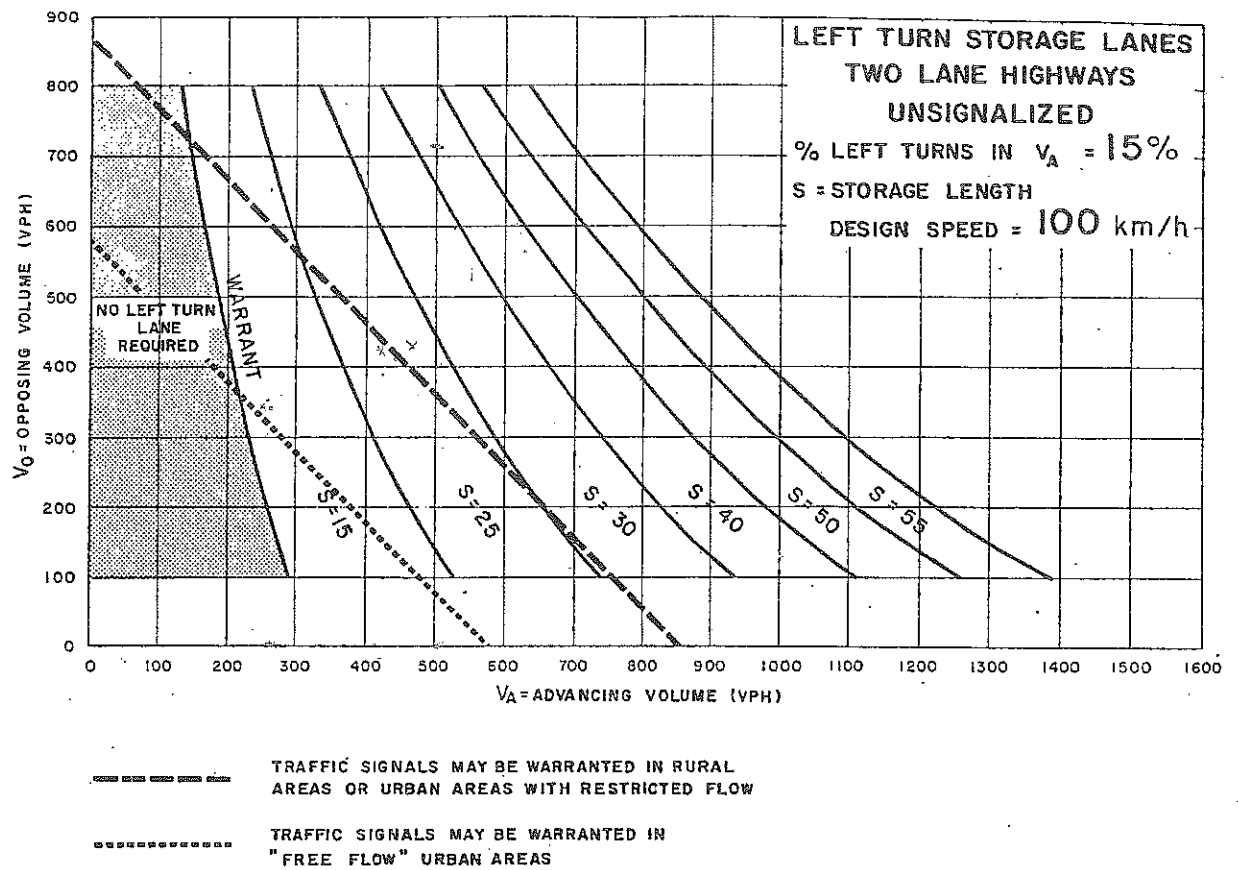


Figure EA-23

## **APPENDIX M**

### **Signal Warrants**

# Signal Warrant Calculation



Cole Engineering

Major Street:

Highway 26

Minor Street:

3rd Line

Comment

Future (2017) Total

Number of Approaches:

1 ☒ 2 ☐

Tee Intersection Configuration:

Yes ☐ No ☒

Flow Condition:

Free Flow (Rural) ☒  
Restricted Flow (Urban) ☐

VOLUME	AM	PM	FACTOR *	
1A - All	669	1,032	n/a	425
1B - MiNor	93	131	25%	56
2A - Major	576	901	25%	369
2B - Cross	38	55	25%	23

\* This factor relates average of the "peak eight hours" to the average of the "am and pm peak hours"

## OVERALL WARRANT

150% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	Warrant for new intersection with forecast traffic
120% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	Warrant for existing intersection with forecast traffic
100% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	Warrant for existing intersection with existing traffic *
COMBO 80% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	Warrant for existing intersection with existing traffic
80% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	

\* Consider full underground provisions if 100% for forecast traffic

## WARRANT 1 - MINIMUM VEHICULAR VOLUME

APPROACH LANES	1		2 OR MORE		AVERAGE HOUR PERIOD
FLOW CONDITION	FREE FLOW	REST. FLOW	FREE FLOW	REST. FLOW	
	X				
ALL APPROACHES	480	720	600	900	425
	% FULFILLED				89%
APPROACH LANES	1		2 OR MORE		AVERAGE HOUR PERIOD
FLOW CONDITION	FREE FLOW	REST. FLOW	FREE FLOW	REST. FLOW	
	X				
MINOR STREET APPROACHES	120	170	120	170	56
	% FULFILLED				47%

150% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
120% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
100% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
80% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>

## WARRANT 2 - DELAY TO CROSS TRAFFIC

APPROACH LANES	1		2 OR MORE		AVERAGE HOUR PERIOD
FLOW CONDITION	FREE FLOW	REST. FLOW	FREE FLOW	REST. FLOW	
	X				
MAJOR STREET APPROACHES	480	720	600	900	369
	% FULFILLED				77%
APPROACH LANES	1		2 OR MORE		AVERAGE HOUR PERIOD
FLOW CONDITION	FREE FLOW	REST. FLOW	FREE FLOW	REST. FLOW	
	X				
TRAFFIC CROSSING MAJOR STREET	50	75	50	75	23
	% FULFILLED				46%

150% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
120% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
100% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
80% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>

1A - MINIMUM VEHICULAR VOLUME: Total vehicle volume on all approaches for average day

1B - MINIMUM VEHICULAR VOLUME: Total vehicle volume on miNor streets

2A - DELAY TO CROSS TRAFFIC: Total vehicle volume on major street for average day

2B - DELAY TO CROSS TRAFFIC: Total vehicle and pedestrian volume crossing major street; comprising: (1) lefts from both miNor streets, (2) heaviest through from miNor street, (3) 50% of heavier left turn from major street when following criteria met: (a) left turn volume >120 and (b) left turn volume plus opposing volume > 720, (4) pedestrians crossing the major street.

# Signal Warrant Calculation



Cole Engineering

Major Street:

Highway 26

Minor Street:

3rd Line

Comment

Future (2017) Total

Number of Approaches:

1 ☒ 2 ☐

Tee Intersection Configuration:

Yes ☐ No ☒

Flow Condition:

Free Flow (Rural) ☒  
Restricted Flow (Urban) ☐

VOLUME	SAT		FACTOR *	
1A - All	998		n/a	499
1B - MiNor	166		50%	83
2A - Major	832		50%	416
2B - Cross	58		50%	29

\* This factor relates average of the "peak eight hours" to the average of the "am and pm peak hours"

## OVERALL WARRANT

150% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	Warrant for new intersection with forecast traffic
120% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	Warrant for existing intersection with forecast traffic
100% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	Warrant for existing intersection with existing traffic *
COMBO 80% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	Warrant for existing intersection with existing traffic
80% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	

\* Consider full underground provisions if 100% for forecast traffic

## WARRANT 1 - MINIMUM VEHICULAR VOLUME

APPROACH LANES	1		2 OR MORE		AVERAGE HOUR PERIOD
FLOW CONDITION	FREE FLOW	REST. FLOW	FREE FLOW	REST. FLOW	
	X				
ALL APPROACHES	480	720	600	900	499
	% FULFILLED				104%
APPROACH LANES	1		2 OR MORE		AVERAGE HOUR PERIOD
FLOW CONDITION	FREE FLOW	REST. FLOW	FREE FLOW	REST. FLOW	
	X				
MINOR STREET APPROACHES	120	170	120	170	83
	% FULFILLED				69%

150% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
120% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
100% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
80% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>

## WARRANT 2 - DELAY TO CROSS TRAFFIC

APPROACH LANES	1		2 OR MORE		AVERAGE HOUR PERIOD
FLOW CONDITION	FREE FLOW	REST. FLOW	FREE FLOW	REST. FLOW	
	X				
MAJOR STREET APPROACHES	480	720	600	900	416
	% FULFILLED				87%
APPROACH LANES	1		2 OR MORE		AVERAGE HOUR PERIOD
FLOW CONDITION	FREE FLOW	REST. FLOW	FREE FLOW	REST. FLOW	
	X				
TRAFFIC CROSSING MAJOR STREET	50	75	50	75	29
	% FULFILLED				58%

150% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
120% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
100% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
80% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>

1A - MINIMUM VEHICULAR VOLUME: Total vehicle volume on all approaches for average day

1B - MINIMUM VEHICULAR VOLUME: Total vehicle volume on miNor streets

2A - DELAY TO CROSS TRAFFIC: Total vehicle volume on major street for average day

2B - DELAY TO CROSS TRAFFIC: Total vehicle and pedestrian volume crossing major street; comprising: (1) lefts from both miNor streets, (2) heaviest through from miNor street, (3) 50% of heavier left turn from major street when following criteria met: (a) left turn volume >120 and (b) left turn volume plus opposing volume > 720, (4) pedestrians crossing the major street.



# Signal Warrant Calculation



Cole Engineering

Major Street:

Highway 26

Minor Street:

3rd Line

Comment

Future (2022) Total

Number of Approaches:

1 ☒ 2 ☐

Tee Intersection Configuration:

Yes ☐ No ☒

Flow Condition:

Free Flow (Rural) ☒  
Restricted Flow (Urban) ☐

VOLUME	AM	PM	FACTOR *	
1A - All	808	1,241	n/a	512
1B - MiNor	142	190	25%	83
2A - Major	666	1,051	25%	429
2B - Cross	52	72	25%	31

\* This factor relates average of the "peak eight hours" to the average of the "am and pm peak hours"

## OVERALL WARRANT

150% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	Warrant for new intersection with forecast traffic
120% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	Warrant for existing intersection with forecast traffic
100% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	Warrant for existing intersection with existing traffic *
COMBO 80% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	Warrant for existing intersection with existing traffic
80% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	

\* Consider full underground provisions if 100% for forecast traffic

## WARRANT 1 - MINIMUM VEHICULAR VOLUME

APPROACH LANES	1		2 OR MORE		AVERAGE HOUR PERIOD
FLOW CONDITION	FREE FLOW	REST. FLOW	FREE FLOW	REST. FLOW	
	X				
ALL APPROACHES	480	720	600	900	512
	% FULFILLED				107%
APPROACH LANES	1		2 OR MORE		AVERAGE HOUR PERIOD
FLOW CONDITION	FREE FLOW	REST. FLOW	FREE FLOW	REST. FLOW	
	X				
MINOR STREET APPROACHES	120	170	120	170	83
	% FULFILLED				69%

150% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
120% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
100% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
80% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>

## WARRANT 2 - DELAY TO CROSS TRAFFIC

APPROACH LANES	1		2 OR MORE		AVERAGE HOUR PERIOD
FLOW CONDITION	FREE FLOW	REST. FLOW	FREE FLOW	REST. FLOW	
	X				
MAJOR STREET APPROACHES	480	720	600	900	429
	% FULFILLED				89%
APPROACH LANES	1		2 OR MORE		AVERAGE HOUR PERIOD
FLOW CONDITION	FREE FLOW	REST. FLOW	FREE FLOW	REST. FLOW	
	X				
TRAFFIC CROSSING MAJOR STREET	50	75	50	75	31
	% FULFILLED				62%

150% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
120% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
100% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
80% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>

1A - MINIMUM VEHICULAR VOLUME: Total vehicle volume on all approaches for average day

1B - MINIMUM VEHICULAR VOLUME: Total vehicle volume on miNor streets

2A - DELAY TO CROSS TRAFFIC: Total vehicle volume on major street for average day

2B - DELAY TO CROSS TRAFFIC: Total vehicle and pedestrian volume crossing major street; comprising: (1) lefts from both miNor streets, (2) heaviest through from miNor street, (3) 50% of heavier left turn from major street when following criteria met: (a) left turn volume >120 and (b) left turn volume plus opposing volume > 720, (4) pedestrians crossing the major street.

# Signal Warrant Calculation



Cole Engineering

Major Street:

Highway 26

Minor Street:

3rd Line

Comment

Future (2022) Total

Number of Approaches:

1 ☒ 2 ☐

Tee Intersection Configuration:

Yes ☐ No ☒

Flow Condition:

Free Flow (Rural) ☒  
Restricted Flow (Urban) ☐

VOLUME	SAT		FACTOR *	
1A - All	1,237		n/a	619
1B - MiNor	247		50%	124
2A - Major	990		50%	495
2B - Cross	80		50%	40

\* This factor relates average of the "peak eight hours" to the average of the "am and pm peak hours"

## OVERALL WARRANT

150% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	Warrant for new intersection with forecast traffic
120% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	Warrant for existing intersection with forecast traffic
100% Satisfied:	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	Warrant for existing intersection with existing traffic *
COMBO 80% Satisfied:	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	Warrant for existing intersection with existing traffic
80% Satisfied:	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	

\* Consider full underground provisions if 100% for forecast traffic

## WARRANT 1 - MINIMUM VEHICULAR VOLUME

APPROACH LANES	1		2 OR MORE		AVERAGE HOUR PERIOD
FLOW CONDITION	FREE FLOW	REST. FLOW	FREE FLOW	REST. FLOW	
	X				
ALL APPROACHES	480	720	600	900	619
	% FULFILLED				129%
APPROACH LANES	1		2 OR MORE		AVERAGE HOUR PERIOD
FLOW CONDITION	FREE FLOW	REST. FLOW	FREE FLOW	REST. FLOW	
	X				
MINOR STREET APPROACHES	120	170	120	170	124
	% FULFILLED				103%

150% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
120% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
100% Satisfied:	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>
80% Satisfied:	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>

## WARRANT 2 - DELAY TO CROSS TRAFFIC

APPROACH LANES	1		2 OR MORE		AVERAGE HOUR PERIOD
FLOW CONDITION	FREE FLOW	REST. FLOW	FREE FLOW	REST. FLOW	
	X				
MAJOR STREET APPROACHES	480	720	600	900	495
	% FULFILLED				103%
APPROACH LANES	1		2 OR MORE		AVERAGE HOUR PERIOD
FLOW CONDITION	FREE FLOW	REST. FLOW	FREE FLOW	REST. FLOW	
	X				
TRAFFIC CROSSING MAJOR STREET	50	75	50	75	40
	% FULFILLED				80%

150% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
120% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
100% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
80% Satisfied:	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>

1A - MINIMUM VEHICULAR VOLUME: Total vehicle volume on all approaches for average day

1B - MINIMUM VEHICULAR VOLUME: Total vehicle volume on miNor streets

2A - DELAY TO CROSS TRAFFIC: Total vehicle volume on major street for average day

2B - DELAY TO CROSS TRAFFIC: Total vehicle and pedestrian volume crossing major street; comprising: (1) lefts from both miNor streets, (2) heaviest through from miNor street, (3) 50% of heavier left turn from major street when following criteria met: (a) left turn volume >120 and (b) left turn volume plus opposing volume > 720, (4) pedestrians crossing the major street.

# Signal Warrant Calculation



Cole Engineering

Major Street: Highway 26

Minor Street: 3rd Line

Comment: Future (2028) Total

Number of Approaches: 1 ☒ 2 ☐

Tee Intersection Configuration: Yes ☐ No ☒

Flow Condition: Free Flow (Rural) ☒ Restricted Flow (Urban) ☐

VOLUME	AM	PM	FACTOR *	
1A - All	970	1,488	n/a	614
1B - MiNor	196	257	25%	113
2A - Major	774	1,231	25%	501
2B - Cross	68	90	25%	40

\* This factor relates average of the "peak eight hours" to the average of the "am and pm peak hours"

## OVERALL WARRANT

150% Satisfied:	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Warrant for new intersection with forecast traffic
120% Satisfied:	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Warrant for existing intersection with forecast traffic
100% Satisfied:	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Warrant for existing intersection with existing traffic *
COMBO 80% Satisfied:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Warrant for existing intersection with existing traffic
80% Satisfied:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	

\* Consider full underground provisions if 100% for forecast traffic

## WARRANT 1 - MINIMUM VEHICULAR VOLUME

APPROACH LANES	1	2 OR MORE		
FLOW CONDITION	FREE FLOW	REST. FLOW	FREE FLOW	REST. FLOW
	X			
ALL APPROACHES	480	720	600	900
	% FULFILLED			128%
APPROACH LANES	1	2 OR MORE		
FLOW CONDITION	FREE FLOW	REST. FLOW	FREE FLOW	REST. FLOW
	X			
MINOR STREET APPROACHES	120	170	120	170
	% FULFILLED			94%

150% Satisfied:	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
120% Satisfied:	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
100% Satisfied:	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
80% Satisfied:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

## WARRANT 2 - DELAY TO CROSS TRAFFIC

APPROACH LANES	1	2 OR MORE		
FLOW CONDITION	FREE FLOW	REST. FLOW	FREE FLOW	REST. FLOW
	X			
MAJOR STREET APPROACHES	480	720	600	900
	% FULFILLED			104%
APPROACH LANES	1	2 OR MORE		
FLOW CONDITION	FREE FLOW	REST. FLOW	FREE FLOW	REST. FLOW
	X			
TRAFFIC CROSSING MAJOR STREET	50	75	50	75
	% FULFILLED			80%

150% Satisfied:	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
120% Satisfied:	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
100% Satisfied:	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
80% Satisfied:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

1A - MINIMUM VEHICULAR VOLUME: Total vehicle volume on all approaches for average day

1B - MINIMUM VEHICULAR VOLUME: Total vehicle volume on miNor streets

2A - DELAY TO CROSS TRAFFIC: Total vehicle volume on major street for average day

2B - DELAY TO CROSS TRAFFIC: Total vehicle and pedestrian volume crossing major street; comprising: (1) lefts from both miNor streets, (2) heaviest through from miNor street, (3) 50% of heavier left turn from major street when following criteria met: (a) left turn volume >120 and (b) left turn volume plus opposing volume > 720, (4) pedestrians crossing the major street.

# Signal Warrant Calculation



Cole Engineering

Major Street: Highway 26

Minor Street: 3rd Line

Comment: Future (2028) Total

Number of Approaches: 1 ☒ 2 ☐

Tee Intersection Configuration: Yes ☐ No ☒

Flow Condition: Free Flow (Rural) ☒ Restricted Flow (Urban) ☐

VOLUME	SAT		FACTOR *
1A - All	1,513	-	n/a 757
1B - MiNor	337		50% 169
2A - Major	1,176		50% 588
2B - Cross	189		50% 94

\* This factor relates average of the "peak eight hours" to the average of the "am and pm peak hours"

## OVERALL WARRANT

150% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>	Warrant for new intersection with forecast traffic
120% Satisfied:	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	Warrant for existing intersection with forecast traffic
100% Satisfied:	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	Warrant for existing intersection with existing traffic *
COMBO 80% Satisfied:	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	Warrant for existing intersection with existing traffic
80% Satisfied:	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>	

\* Consider full underground provisions if 100% for forecast traffic

## WARRANT 1 - MINIMUM VEHICULAR VOLUME

APPROACH LANES	1	2 OR MORE	
FLOW CONDITION	FREE FLOW X	REST. FLOW X	AVERAGE HOUR PERIOD
ALL APPROACHES	480	720 600 900	757
		% FULFILLED	158%
APPROACH LANES	1	2 OR MORE	
FLOW CONDITION	FREE FLOW X	REST. FLOW X	AVERAGE HOUR PERIOD
MINOR STREET APPROACHES	120	170 120 170	169
		% FULFILLED	141%

150% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
120% Satisfied:	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>
100% Satisfied:	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>
80% Satisfied:	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>

## WARRANT 2 - DELAY TO CROSS TRAFFIC

APPROACH LANES	1	2 OR MORE	
FLOW CONDITION	FREE FLOW X	REST. FLOW X	AVERAGE HOUR PERIOD
MAJOR STREET APPROACHES	480	720 600 900	588
		% FULFILLED	123%
APPROACH LANES	1	2 OR MORE	
FLOW CONDITION	FREE FLOW X	REST. FLOW X	AVERAGE HOUR PERIOD
TRAFFIC CROSSING MAJOR STREET	50	75 50 75	94
		% FULFILLED	188%

150% Satisfied:	Yes	<input type="checkbox"/>	No	<input checked="" type="checkbox"/>
120% Satisfied:	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>
100% Satisfied:	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>
80% Satisfied:	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>

1A - MINIMUM VEHICULAR VOLUME: Total vehicle volume on all approaches for average day

1B - MINIMUM VEHICULAR VOLUME: Total vehicle volume on miNor streets

2A - DELAY TO CROSS TRAFFIC: Total vehicle volume on major street for average day

2B - DELAY TO CROSS TRAFFIC: Total vehicle and pedestrian volume crossing major street; comprising: (1) lefts from both miNor streets, (2) heaviest through from miNor street, (3) 50% of heavier left turn from major street when following criteria met: (a) left turn volume >120 and (b) left turn volume plus opposing volume > 720, (4) pedestrians crossing the major street.

## **APPENDIX N**

### **Statement Of Limiting Condtions And Assumptions**

## Statement of Limiting Conditions and Assumptions

1. This Report/Study (the “Work”) has been prepared at the request of, and for the exclusive use of, the Owner, and its affiliates (the “Intended Users”). No one other than the Intended Users has the right to use and rely on the Work without first obtaining the written authorization of Cole Engineering Group Ltd. (Cole Engineering) and its Owner.
2. Cole Engineering expressly excludes liability to any party except the Intended Users for any use of, and/or reliance upon, the Work.
3. Cole Engineering notes that the following assumptions were made in completing the Work:
  - a) the land use description(s) supplied to us are correct;
  - b) the surveys and data supplied to Cole Engineering by the Owner are accurate;
  - c) market timing, approval delivery and secondary source information is within the control of Parties other than Cole Engineering; and
  - d) there are no encroachments, leases, covenants, binding agreements, restrictions, pledges, charges, liens or special assessments outstanding, or encumbrances which would significantly affect the use or servicing.

Investigations have not been carried out to verify these assumptions. Cole Engineering deems the sources of data and statistical information contained herein to be reliable, but we extend no guarantee of accuracy in these respects.

4. Cole Engineering accepts no responsibility for legal interpretations, questions of survey, opinion of title, hidden or inconspicuous conditions of the property, toxic wastes or contaminated materials, soil or sub-soil conditions, environmental, engineering or other factual and technical matters disclosed by the Owner, the Client, or any public agency, which by their nature, may change the outcome of the Work. Such factors, beyond the scope of this Work, could affect the findings, conclusions and opinions rendered in the Work. We have made disclosure of related potential problems that have come to our attention. Responsibility for diligence with respect to all matters of fact reported herein rests with the Intended Users.
5. Cole Engineering practices engineering in the general areas of infrastructure and transportation. It is not qualified to and is not providing legal or planning advice in this Work.
6. The legal description of the property and the area of the site were based upon surveys and data supplied to us by the Owner. The plans, photographs, and sketches contained in this report are included solely to aide in visualizing the location of the property, the configuration and boundaries of the site, and the relative position of the improvements on the said lands.
7. We have made investigations from secondary sources as documented in the Work, but we have not checked for compliance with by-laws, codes, agency and governmental regulations, etc., unless specifically noted in the Work.
8. Because conditions, including capacity, allocation, economic, social, and political factors change rapidly and, on occasion, without notice or warning, the findings of the Work expressed herein, are as of the date of the Work and cannot necessarily be relied upon as of any other date without subsequent advice from Cole Engineering.
9. The value of proposed improvements should be applied only with regard to the purpose and function of the Work, as outlined in the body of this Work. Any cost estimates set out in the Work are based on construction averages and subject to change.
10. Neither possession of the Work, nor a copy of it, carries the right of publication. All copyright in the Work is reserved to Cole Engineering. The Work shall not be disclosed, produced or reproduced, quoted from, or referred to, in whole or in part, or published in any manner, without the express written consent of Cole Engineering and the Owner.
11. The Work is only valid if it bears the professional engineer’s seal and original signature of the author, and if considered in its entirety. Responsibility for unauthorized alteration to the Work is denied.