



**Mount Hope
West Secondary
Plan Town of
Caledon
Proposed Residential
Development
Transportation Impact Study**

Paradigm Transportation Solutions Limited

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Project Summary



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Mount Hope West Secondary Plan, Town of Caledon, ON Transportation Impact Study

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Executive Summary

Introduction

Paradigm Transportation Solutions Limited (Paradigm) was retained by Solmar Development Corp on behalf of United Holdings Inc. (the client) to conduct a Transportation Impact Study for a proposed residential subdivision development containing a commercial block, at the northwest quadrant of Columbia Way and Mount Hope Road in the Town of Caledon.

The Transportation Impact Study includes an assessment of the existing transportation network and analyzes existing and future traffic conditions (with and without the proposed development). This study provides a review of the proposed parking supply and a review of access and on-site circulation.

The findings, conclusions, and recommendations of this study are summarized below and outlined in further detail in the body of the report.

Development Concept

The subject site is located in the northwest quadrant of Columbia Way and Mount Hope Road in the Town of Caledon. It is currently undeveloped.

The property owner is proposing to create a residential subdivision with up to 1,016 dwelling units. This will include a mix of detached homes, townhouses, apartments, and block townhouses. The commercial land parcel spans approximately 1.72 hectares (17,200 m²). The land coverage was assumed to be 25% with a one-story building, resulting in a gross floor area of 4,200 m² (45,208.4 sq.ft.).

Vehicle access is proposed via a new access road on Columbia Way (Street A, opposite Westchester Boulevard), two new access roads on Mount Hope Road (Street B and Street C), and two new driveways onto Mount Hope Road (the north and south ends of Street L).



Conclusions

Based on the investigations carried out, it is concluded that:

- ▶ **Existing Operations:** all study area intersections operate at acceptable levels of service and within capacity during the AM, and PM peak hour analysis time periods.
- ▶ **Site Generated Traffic:** The subject site is estimated to generate approximately 434 new AM peak hour trips and approximately 539 new PM peak hour trips.
- ▶ **2028 Background Traffic Operations:** Critical movements not observed in existing traffic conditions include:
 - Highway 50 [Peel Regional Road 50] & Columbia Way: The westbound left-turn queue length is forecast to exceed available storage by 29m during the AM peak hour.
- ▶ **2028 Total Traffic Operations:** the forecasting showed the following Critical movements that were not present under existing conditions:
 - Highway 50 [Peel Regional Road 50] & Columbia Way:
 - The westbound queue length is forecast to exceed available storage by 18m during the PM peak hour.
 - Columbia Way & Westchester Road/Proposed North-South Road:
 - The northbound approach, northbound through movement, southbound approach and southbound through movement are forecast to operate with an Operate with delays in the LOS F range during the AM peak hour with a v/c ratio greater than 1.00.
 - The northbound through and southbound through movements are forecast with an unacceptable Volume to Capacity (V/C) ratio during the AM peak hour.
- ▶ **Mount Hope Road & Columbia Way:**
 - The northbound approach, northbound through movement, southbound approach and southbound through movement are forecast to operate with an unacceptable LOS F during the AM peak hour.
 - The southbound through is also forecast to operate with an unacceptable V/C ratio during the AM peak hour
 - The overall intersection is forecast to operate with an unacceptable LOS F during the AM peak hour.



- ▶ Caledon-King Townline South & Columbia Way:
 - The overall intersection is forecast to operate with an unacceptable LOS F during the AM peak hour;
 - The eastbound left is forecast to operate with an unacceptable LOS F during both peak hours with an unacceptable V/C ratio;
 - The eastbound approach is forecast to operate with an unacceptable LOS F during both peak hours.
- ▶ **2033 Background Traffic Operations:** the forecasting showed the following critical movements that were not present under the 2028 background operations include:
 - Highway 50 [Peel Regional Road 50] & Columbia Way:
 - The westbound queue length is forecast to exceed available storage by 2m during the PM peak hour.
 - Caledon-King Townline South & Columbia Way:
 - The eastbound left-turn is forecast to operate with an unacceptable LOS F during the AM peak hour.
 - The eastbound approach is forecast to operate with an unacceptable LOS F during the AM peak hour.
- ▶ **2033 Total Traffic Operations:** the forecasting showed the following critical movements that were not present under the 2028 background operations include:
 - Caledon-King Townline South & Columbia Way:
 - The eastbound left-turn is forecast to operate with an unacceptable LOS F during the PM peak hour with an unacceptable V/C ratio of 1.38.
- ▶ The following **mitigation measures** were considered:
 - The traffic signal warrant analyses indicate that the intersection volumes do not justify signalization under 2033 total traffic condition for the intersections of Columbia Way and Westchester Road, Columbia Way and Mount Hope Road, and Caledon-King Townline South and Columbia Way.
 - At the intersection of Highway 50 and Columbia Way, the westbound left-turn lane is expected to exceed its capacity which is triggered by this development and other proposed developments.
 - To mitigate this, optimizing the cycle length and intersection splits is recommended. A 60-second cycle is forecast to



significantly reduce queue lengths. However, this cycle length may not provide enough storage space, so it is also advised to increase the storage length to 61m to handle any excess queues.

Recommendations

To address the westbound left-turn lane capacity issues at the intersection of Highway 50 and Columbia Way, signal timing adjustments and increasing the westbound left-turn lane storage length is recommended. The cycle length should be adjusted to a 60-second cycle which results in a significant reduction in queue lengths. However, to ensure sufficient capacity, it is also recommended to increase the storage length by 5 m to accommodate any potential excess queues.



Contents

1	Introduction	1
1.1	Overview	1
2	Existing Conditions	4
2.1	Road Network	4
2.2	Transit Service.....	7
2.2.1	Existing Transit Services	7
2.2.2	Future Transit Services	7
2.3	Active Transportation	9
2.3.1	Walking.....	9
2.3.2	Cycling.....	9
2.4	Traffic Volumes	9
2.5	Traffic Operations	12
3	Development Concept	16
3.1	Description.....	16
3.2	Site-Generated Traffic.....	16
4	Future Traffic Conditions	24
4.1	Forecast Background Traffic Volumes.....	24
4.2	Forecast Total Traffic Volumes	26
4.3	Traffic Operations	35
4.3.1	2028 Background Traffic	35
4.3.2	2028 Total Traffic	38
4.3.3	2033 Background Traffic	42
4.3.4	2033 Total Traffic	45
4.4	Mitigation Measures	48
4.4.1	Traffic Signal Warrants.....	48
4.4.2	Highway 50 [Peel Regional Road 50] and Columbia Way.....	49
5	Conclusions and Recommendations	52
5.1	Conclusions.....	52
5.2	Recommendations	54



Appendices

Appendix A	Pre-Study Consultation Material and Responses
Appendix B	Traffic Count Data
Appendix C	Signal Timings
Appendix D	Synchro Reports – Existing Operations
Appendix E	ITE Trip Generation Reports
Appendix F	Synchro Reports – 2028 Background Operations
Appendix G	Synchro Reports – 2028 Total Operations
Appendix H	Synchro Reports – 2033 Background Operations
Appendix I	Synchro Reports – 2033 Total Operations
Appendix J	Synchro Reports – 2033 Mitigations
Appendix K	Traffic Signal Warrant



Figures

Figure 1.1:	Location of Subject Site and Study Area.....	3
Figure 2.1:	Existing Lane Configuration and Traffic Control	6
Figure 2.2:	Base Year (2023) Traffic Volumes – AM Peak Hour ..	10
Figure 2.3:	Base Year (2023) Traffic Volumes – PM Peak Hour ..	11
Figure 3.1:	Site Concept Plan	18
Figure 3.2:	Site Generated Traffic Volumes – AM Peak Hour	20
Figure 3.3:	Site Generated Traffic Volumes – PM Peak Hour.....	21
Figure 4.1:	2028 Background Traffic Volumes – AM Peak Hour..	27
Figure 4.2:	2028 Background Traffic Volumes – PM Peak Hour..	28
Figure 4.3:	2028 Total Traffic Volumes – AM Peak Hour	29
Figure 4.4:	2028 Total Traffic Volumes – PM Peak Hour	30
Figure 4.5:	2033 Background Traffic Volumes – AM Peak Hour..	31
Figure 4.6:	2033 Background Traffic Volumes – PM Peak Hour..	32
Figure 4.7:	2033 Total Traffic Volumes – AM Peak Hour	33
Figure 4.8:	2033 Total Traffic Volumes – PM Peak Hour	34

Tables

Table 2.1:	Vehicle Level of Service Definitions	12
Table 2.2:	AM Existing Traffic Operations	14
Table 2.3:	PM Existing Traffic Operations.....	15
Table 3.1:	Trip Generation	19
Table 3.2:	Trip Distribution –trips to Site	22
Table 3.3:	Trip Distribution – trips From Site.....	23
Table 4.1:	Background Developments	25
Table 4.2:	2028 AM Background Traffic Operations	36
Table 4.3:	2028 PM Background Traffic Operations.....	37
Table 4.4:	2028 AM Total Traffic Operations.....	40
Table 4.5:	2028 PM Total Traffic Operations	41
Table 4.6:	2033 AM Background Traffic Operations	43
Table 4.7:	2033 PM Background Traffic Operations.....	44
Table 4.8:	2033 AM Total Volumes Traffic Operations.....	46
Table 4.9:	2033 PM Total Volumes Traffic Operations	47
Table 4.10:	Signal Justification Results	49
Table 4.11:	2033 AM Total Traffic Operations (mitigated).....	51



1 Introduction

1.1 Overview

Solmar Development, on behalf of United Holdings Inc., retained Paradigm Transportation Solutions Limited (Paradigm) to complete this Transportation Impact Study (TIS) for a proposed residential subdivision with a commercial block.

The subject site is located in the northwest quadrant of Columbia Way and Mount Hope Road in the Town of Caledon. It is currently undeveloped.

The property owner is proposing to create a residential subdivision with up to 1,016 dwelling units. This will include a mix of detached homes, townhouses, apartments, and block townhouses. The commercial land parcel spans approximately 1.72 hectares (17,200 m²). The land coverage was assumed to be 25% with a one-story building, resulting in a gross floor area of 4,200 m² (45,208.4 sq.ft.).

Vehicle access is proposed via a new access road on Columbia Way (Street A, opposite Westchester Boulevard), two new access roads on Mount Hope Road (Street B and Street C), and two new driveways onto Mount Hope Road (the north and south ends of Street L).

This study determines the impacts of the development traffic on the surrounding road network and identifies any necessary mitigation to accommodate the site generated traffic.

The study scope includes:

- ▶ Assessment of current traffic conditions in the study area;
- ▶ Estimates of background traffic growth;
- ▶ Estimates of additional traffic generated by the subject site;
- ▶ Analyses of the impact of future traffic on the surrounding road network;
- ▶ Recommendations required to mitigate the impacts of future traffic in a satisfactory manner.

The study area intersections assessed were:

- ▶ Highway 50 [Peel Regional Road 50] and Columbia Way (signalized);
- ▶ Kingsview Drive and Columbia Way (unsignalized);



- ▶ Westchester Road Columbia Way (unsignalized);
- ▶ Mount Hope Road and Columbia Way (unsignalized);
- ▶ Forest Gate Avenue and Columbia Way (unsignalized);
- ▶ Caledon-King Townline South and Columbia Way (unsignalized);
- ▶ Mount Hope Road and Castlederg Side Road (unsignalized);
- ▶ Proposed North-South Street A & Columbia Way (unsignalized);
- ▶ Mount Hope Road & Proposed East-West Street C (unsignalized);
- ▶ Mount Hope Road & Proposed East-West Street B (unsignalized).

Terms of Reference were provided to the Town of Caledon and to Peel Region; the Study Area did not include roads or intersections in Vaughan or York Region.

This study has been completed in accordance with the Town of Caledon *Transportation Impact Studies Terms of Reference and Guidelines*¹ and direction provided by Town and Region staff during pre-study consultation.

Appendix A contains the pre-study consultation material and comments provided by the Region of Peel and Town of Caledon staff. **Figure 1.1** illustrates the site location.

¹ Town of Caledon, *Transportation Impact Studies Terms of Reference and Guidelines*, March 2017.





Location of Subject Site and Study Area

2 Existing Conditions

2.1 Road Network

The characteristics of the roads and intersections in the vicinity of the subject site are described below. Reference was made to the Town of Caledon *Official Plan, Schedule J – Long Range Road Network*.²:

- ▶ **Highway 50 [Peel Regional Road 50]:** A north-south, high-capacity arterial road with multiple lanes in both directions. The posted speed limit is 50 km/h north of Columbia Way, and 60 km/h south of Columbia Way. A sidewalk is present only on the east side on the segment north of Columbia Way. There are no dedicated cycling facilities. The study area was limited to the portion with the Town of Caledon / Peel Region.
- ▶ **Columbia Way:** An east-west collector road in the study area with two lanes (one lane per direction). The posted speed limit is 40 km/h with the posted speed limit changing to 50 km/h east of Westchester Road, and sidewalks are provided only on the south side of roadway. There are no dedicated cycling facilities.
- ▶ **Kingsview Drive:** A north-south road in the study area with two lanes (one lane per direction). The posted speed limit is 40 km/h, and sidewalks are present on both sides of the roadway. There are no dedicated cycling facilities.
- ▶ **Westchester Road:** A north-south local road in the study area with two lanes (one lane per direction). The posted speed limit is 40 km/h, with sidewalks on both sides of the road. There are no dedicated cycling facilities.
- ▶ **Mount Hope Road:** A north-south collector road in the study area with two lanes (one lane per direction). The posted speed limit is 60 km/h, and sidewalks are not present on both sides of the road north of Columbia Way, however south of Columbia Way sidewalks are present on east side of the roadway. This road is part of a signed cycling route
- ▶ **Forest Gate Avenue:** A north-south local road in the study area with two lanes (one lane per direction). The posted speed limit is 40 km/h, and sidewalks are present on both sides of the roadway. There are no dedicated cycling facilities.
- ▶ **Caledon-King Townline South:** A north-south collector road in the study area with two lanes (one lane per direction). The

² Town of Caledon, *Official Plan, Schedule J – Long Range Road Network*, April 2018.

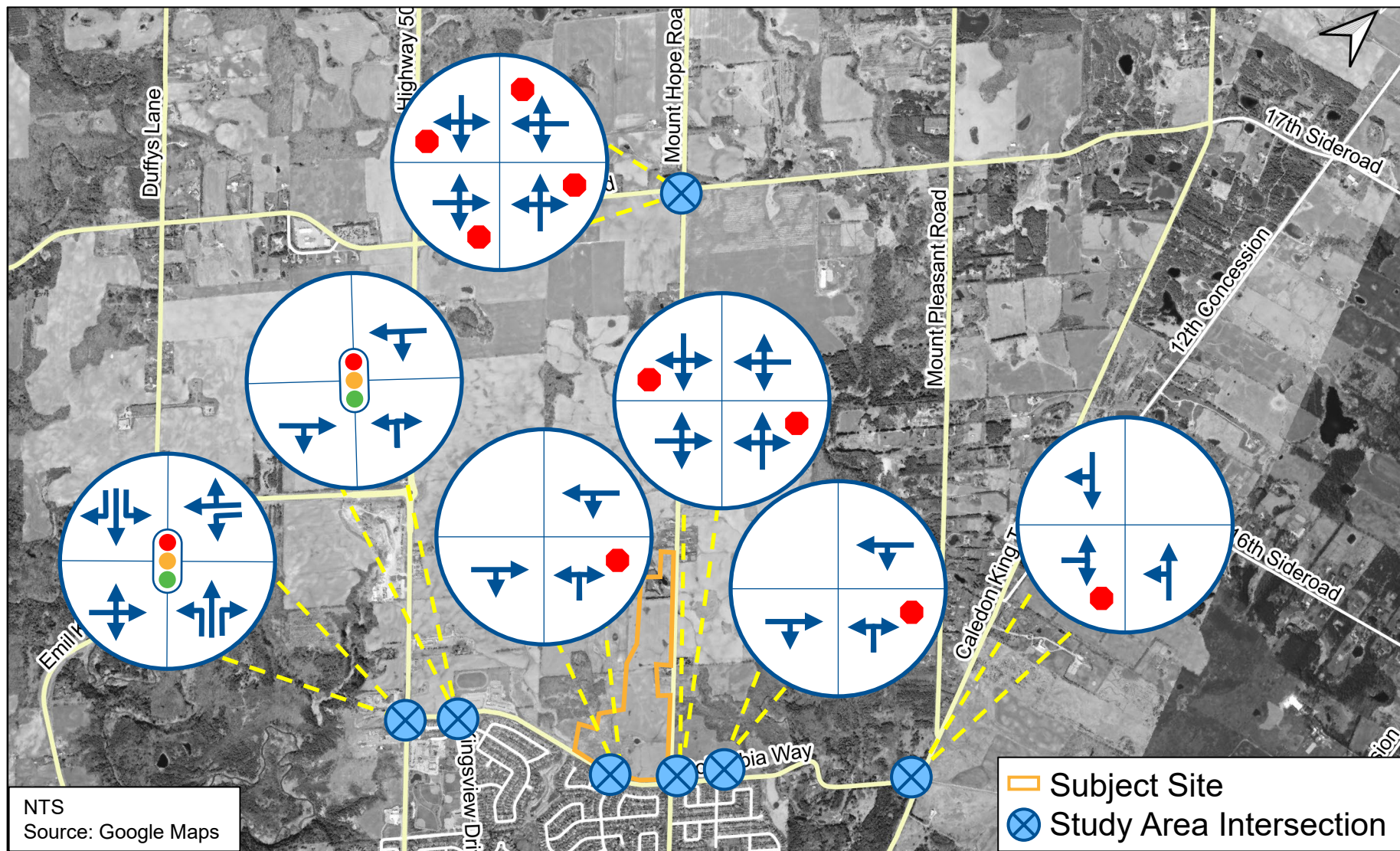


posted speed limit of 60 km/h. Sidewalks are not present on the roadway, and there are no on-street cycling lanes.

- ▶ **Castlederg Side Road:** An east-west collector study area in the vicinity with two lanes (one lane per direction). The posted speed limit of 70 km/h. Sidewalks are not present on the roadway, and there are no on-street cycling lanes.

Figure 2.1 illustrates the existing lane configuration and traffic control at the study area intersections.





2.2 Transit Service

2.2.1 Existing Transit Services

The Town of Caledon does not run any regular transit service within the study area. There are two on-demand specialized transit services provided currently:

- ▶ **TransHelp** is a specialized transit service that provides specific trips, flexible trips, subscription trips, return trips and cross-boundary trips to people with disabilities across Peel Region;³ and
- ▶ **Caledon Community Services (CCS)** is a door-to-door transportation service available for seniors and people with disabilities (unable to drive on their own).⁴

In addition, the following transit agencies operates routes serving the wider Bolton community:

- ▶ **Brampton Transit** operates route 41 BOLTON LINE, between Highway 50 at Caledon Recreation Centre and Queen St & Highway 50 westbound. The nearest stop is at Kingsview Drive and Rotarian Way, approximately 1 km from the site. This route provides connections to other Brampton Transit routes.
- ▶ **Metrolinx** operates route 38 BOLTON/MALTON, between Highway 50 at Columbia Way and Malton GO. The nearest stop is at Highway 50 at Columbia Way, approximately 1 km from the site. This route also serves also park-and-ride facilities on Regional Road 50 at George Bolton Parkway (5.5km / 8-minute drive from the site) and on Mayfield Rd at Highway 50 (7.1km / 10-minute drive from the site). This route provides connections to the wider regional transit network.

2.2.2 Future Transit Services

The subject site is on the north side of Bolton, the largest community in Caledon. It has a population of about 26,000, making up roughly two-thirds of the town's population. The community is divided by Highway 50, with the southwest portion used for employment and the northeast for residential purposes, including two secondary schools. The

³ Region of Peel, *My Trips*, Accessed 7 December 2024.

<https://www.peelregion.ca/transhelp/my-trips#fares>

⁴ Caledon Community Services, *Specialized Transportation Application*, Accessed 7 December 2024. <https://ccs4u.org/specialized-transportation-application>



Caledon Transit Feasibility Study proposed three local service options for Bolton⁵:

- ▶ **Route B1:** A short, direct route along the commercial corridor of Highway 50. Possible service approaches: fixed route (2 vehicles);
- ▶ **Route B2:** A more extensive route covering both residential and employment areas, including service to the secondary schools. Possible service approaches: fixed route (4 vehicles);
- ▶ **Route B3:** A demand-responsive service throughout the urban area. Possible service approaches: demand-responsive (6 vehicles).

As part of Caledon's broader strategy to expand town-wide transit, as outlined in the 2023-2035 Strategic Plan. In partnership with Brampton Transit, Caledon has expanded local transit services in several key areas:

- ▶ **Bolton:** As of May 1, 2024, Brampton Transit operates Route 41 along Highway 50, connecting Queen Street/Highway 7 in Brampton to Columbia Way/Bolton Heights in Caledon;
- ▶ **Southfields Village:** As of January 8, 2024, Brampton Transit enhanced Route 81 by adding midday service and extending operations until 8:30 PM;
- ▶ **Dixie Road:** As of September 5, 2023, select Route 18 trips were extended north of Mayfield Road into Caledon, providing nine trips per day during peak hours, midday, and evenings.

These initiatives are part of Caledon's broader strategy to expand town-wide transit, as outlined in the 2023-2035 Strategic Plan.

An Official Plan Amendment (OPA) has been submitted to the Town of Caledon for a future GO Train station. Alongside enhancements to bus services, Caledon's new Official Plan outlines the development of a future GO Train station. Caledon Station will have a diverse mix of uses, it will offer residents access to over 75 acres of parks, ponds, trails, and cycle-friendly pathways featuring shops, restaurants, workplaces, and the proposed Caledon GO Station. This future GO Station and transit hub will provide seamless connections to the GTA. The introduction of any of these routes will result in lower auto use within the community.

⁵ Town of Caledon, *Caledon Transit Feasibility Study*, Accessed 7 December 2024.
<https://haveyoursaycaledon.ca/10811/widgets/45771/documents/21247>



2.3 Active Transportation

2.3.1 Walking

With the exception of the proposed commercial area within the subject site, there are few destinations within walking distance of residents of the proposed development. The study area is mostly surrounded by low-density detached houses and townhomes. Mount Hope (9048 Columbia Way) has a Walk Score of 33 out of 100. This location is described as “Car-Dependent: most errands require a car”.⁶

2.3.2 Cycling

Mount Hope (9048 Columbia Way) has a Bike Score of 29 which is described as “Somewhat Bikeable: minimal bike infrastructure”. Most other streets in the study area lack dedicated cycling facilities, requiring cyclists to share the travelled roadway with motor vehicles.

Based on the *Caledon Active Transportation Master Plan*,⁷ future cycling facilities are proposed along Highway 50, Mount Hope Road, and Castlederg Side Road.

2.4 Traffic Volumes

To assess intersection operations, turning movement counts (TMCs) are used to quantify the movement of vehicles, pedestrians, trucks, buses, and cyclists through an intersection. Existing traffic data at an intersection or on a road section forms the foundation for operational analysis. The counts are usually collected during peak periods to complete level of service (LOS) analysis under its worst-case operating conditions.

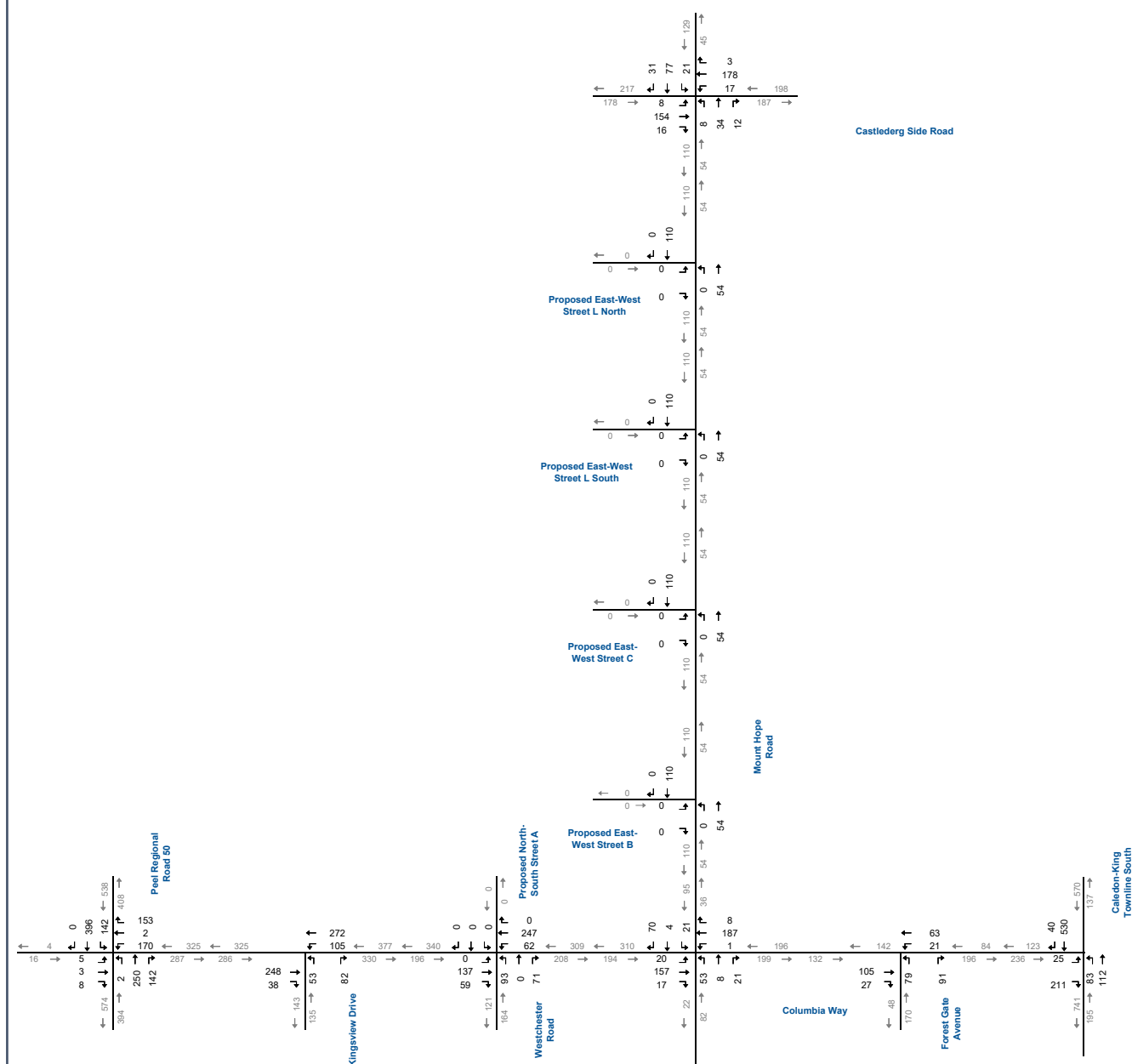
TMCs for the study area intersections were collected in October 2023 and January 2024 to include the intersection of Forest Gate Avenue and Columbia Way. **Appendix B** contains complete TMC data.

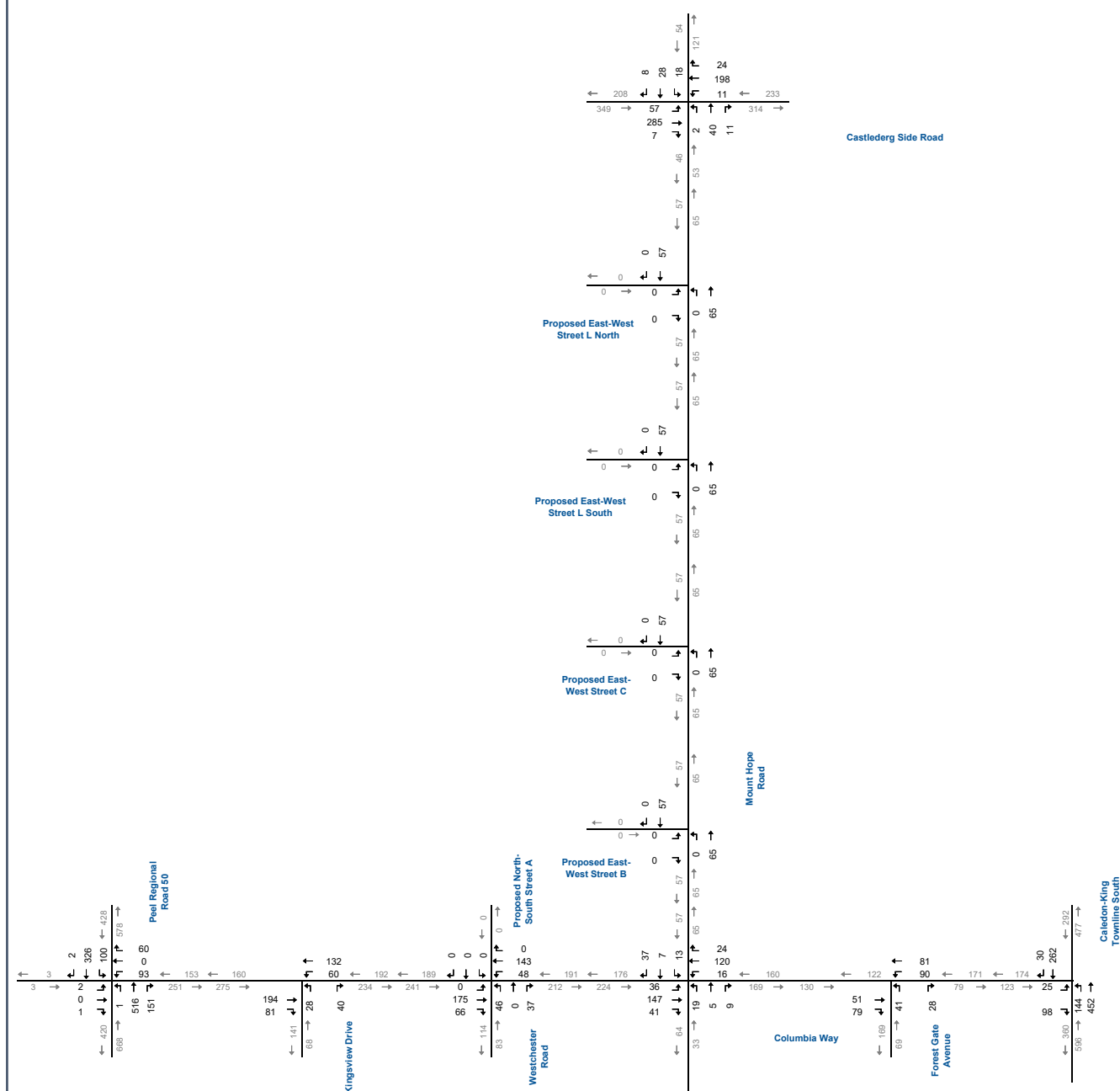
Figure 2.2 and **Figure 2.3** illustrate the base year (2023) AM and PM weekday peak hour traffic volumes, respectively.

⁶ Walk Score, *9048 Columbia: A location in Caledon*, Accessed 7 December 2024. [9048 Columbia Way, Caledon ON - Walk Score](#)

⁷ Town of Caledon, *Caledon Active Transportation Master Plan*, June 2024, p153 of PDF.







Base Year (2023) Traffic Volumes PM Peak Hour

2.5 Traffic Operations

Intersection level of service (LOS) is a recognized method of quantifying the delay experienced by drivers at intersections. The term “Level of Service” denotes how well a traffic movement operates under given traffic demands, lane arrangements, and traffic controls. Each level is determined by the average amount of control delay per vehicle. Control delay is the total delay associated with stopping for a signal or stop sign, and includes four components: deceleration delay, stopped delay, queue move up time and final acceleration delay.

Table 2.1 contains the level of service criteria for traffic signal controlled and stop-controlled intersections. As shown, LOS A indicates small average control delays (less than 10 second per vehicle) whereas LOS F indicates intersection failure, which results in extensive vehicular queues and long delays (over 50 seconds per vehicle at an unsignalized intersection, and over 80 seconds per vehicle at a traffic signal-controlled intersection).

TABLE 2.1: VEHICLE LEVEL OF SERVICE DEFINITIONS

LOS	Signalized Intersections Average Total Delay (seconds per vehicle)	Stop-Controlled Intersections Average Total Delay (seconds per vehicle)
A	≤ 10	≤ 10
B	> 10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E	> 55 and ≤ 80	> 35 and ≤ 50
F	> 80	> 50

The Town of Caledon identifies critical movements as follows:⁸

- ▶ Signalized intersections:
 - Volume to capacity (V/C) ratio for overall intersections, through movements or shared through/turning movements increased to 0.90 or above;
 - V/C ratios for individual through or turning movements increase to 1.00 or higher; or

⁸ Town of Caledon, *Transportation Impact Studies Terms of Reference and Guidelines*, March 2017.



- 95th percentile queue lengths for an individual movement exceed available lane storage.
- ▶ Unsignalized intersections:
 - Level of service, based on average delay per vehicle, on individual movements, exceed LOS E; *or*
 - The estimated maximum queue length for an individual movement exceeds the available lane storage.

To assess the base year (2023) peak hour automobile conditions, an operational analysis was conducted for the weekday AM and PM peak hour traffic volumes at the study area intersections using Synchro software, which implements the methods of the Highway Capacity Manual. The key parameters used in the analysis include:

- ▶ Existing lane configurations;
- ▶ Heavy vehicle percentages derived from existing traffic count data;
- ▶ Conflicting pedestrian volumes derived from existing traffic count data;
- ▶ Calculated intersection peak hour factors (PHF), which facilitates an assessment of the busiest 15-minute period within the peak hour; and
- ▶ Synchro default values for all other inputs.

The existing traffic intersection operations for the AM and PM peak hours are summarized in **Table 2.2** and **Table 2.3**, respectively. Detailed Synchro reports are provided in **Appendix D**.

The LOS tables show that all vehicle movements at intersections within the study area are operating with acceptable delays, levels of service, and within capacity.



TABLE 2.2: AM EXISTING TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Hwy 50 [Peel Regional Road 50] & Columbia Way	TCS	LOS Delay V/C Q Stor. Avail.	< < < < <	C 35 0.04 6 -	> > > > >	C 35	D 52 0.75 56 60 4	D 36 0.14 11 - -	> > > > >	D 44	A 6 0.01 1 136 135	A 8 0.27 43 -	A 7 0.12 6 300 294	A 7	A 8 0.27 28 85 57	A 9 0.40 70 - 25	A 9	B 18 0.48	
	Kingsview Drive & Columbia Way	TCS	LOS Delay V/C Q		A 6 0.34 33	> > > > >	A 6	< < < < <	A 8 0.56 53		A 8	D 46 0.62 28		> > > > >	D 46					B 14 0.57
	Westchester Road & Columbia Way	TWSC	LOS Delay V/C Q		A 0 0.18 0	> > > > >	A 0	< < < < <	A 2 0.08 2		A 2	D 26 0.60 31		> > > > >	D 26					A 7 0.47
	Mount Hope Road & Columbia Way	TWSC	LOS Delay V/C Q	< < < < <	A 1 0.02 1	> > > > >	A 1	< < < < <	A 0 0.00 0	> > > > >	A 0	< < < < <	C 20 0.33 11	> > > > >	C 20	< < < < <	B 13 0.23 7	> > > > >	B 13	A 5 0.42
	Caledon-King Townline South & Columbia Way	TWSC	LOS Delay V/C	C 22 0.55		> > >	C 22					< < <	A 4 0.09		A 4		A 0 0.36	> > >	A 0	A 6 0.65
	Mount Hope Road & Castlederg Side Road	AWSC	LOS Delay V/C Q	< < < < <	A 10 0.29	> > > > >	A 10	< < < < <	A 10 0.32	> > > > >	A 10	< < < < <	A 9 0.10	> > > > >	A 9	< < < < <	A 9 0.22	> > > > >	A 9	A 10 0.32
	Forest Gate Avenue & Columbia Way	TWSC	LOS Delay V/C Q		A 0 0.09 0	> > > > >	A 0	< < < < <	A 2 0.02 0		A 2	B 11 0.24 8		> > > > >	B 11					A 5 0.32

MOE - Measure of Effectiveness

LOS - Level of Service

Delay - Average Delay per Vehicle in Seconds

V/C - Volume to Capacity Ratio

Q - 95th Percentile Queue Length (m)

Stor. - Existing Storage (m)

Avail. - Available Storage (m)

TCS - Traffic Control Signal

TWSC - Two-Way Stop Control

AWSC - All-Way Stop Control

< / > - Shared with through movement



TABLE 2.3: PM EXISTING TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
PM Peak Hour	Hwy 50 [Peel Regional Road 50] & Columbia Way	TCS	LOS Delay V/C Q Stor. Avail.	< < < < <	D 40 0.00 0 -	> > > > >	D 40 0.64 34 60 26	< < < < <	D 47 0.04 0 -	> > > > >	D 47 0.00 1 136 135	A 3 0.38 60 -	A 3 0.10 6 300 294	A 4 0.17 0.24 0.00 85 - 25	A 4 4 3 0 25	A 4 3 0 25	A 4 0.41			
	Kingsview Drive & Columbia Way	TCS	LOS Delay V/C Q		A 3 0.22 19	> > > > >	A 3 < < < <	A 4 0.18 16		A 4 0.21 15	> > > > >	C 31						A 7 0.22		
	Westchester Road & Columbia Way	TWSC	LOS Delay V/C Q		A 0 0.15 0	> > > > >	A 0 < < < <	A 2 0.04 1		A 2 0.15 4	> > > > >	B 12						A 3 0.38		
	Mount Hope Road & Columbia Way	TWSC	LOS Delay V/C Q	< < < <	A 1 0.03 1	> > > > >	A 1 < < < <	A 1 0.01 0	> > > > >	A 1 < < < <	B 12 0.07 2	> > > > >	B 12 < < < <	B 11 0.09 2	> > > > >	B 11	A 3 0.30			
	Caledon-King Townline South & Columbia Way	TWSC	LOS Delay V/C	B 15 0.26		> > >	B 15					< < <	A 3 0.12		A 3		A 0 0.18	> > >	A 0 0.65	
	Mount Hope Road & Castlederg Side Road	AWSC	LOS Delay V/C Q	< < < <	B 12 0.47	> > > > >	B 12 < < < <	A 10 0.33	> > > > >	A 10 < < < <	A 9 0.09	> > > > >	A 9 < < < <	A 9 0.09	> > > > >	A 9	B 11 0.51			
	Forest Gate Avenue & Columbia Way	TWSC	LOS Delay V/C Q		A 0 0.09 0	> > > > >	A 0 < < < <	A 4 0.07 2		A 4 0.12 3	B 11	> > > > >	B 11						A 4 0.31	

MOE - Measure of Effectiveness

LOS - Level of Service

Delay - Average Delay per Vehicle in Seconds

V/C - Volume to Capacity Ratio

Q - 95th Percentile Queue Length (m)

Stor. - Existing Storage (m)

Avail. - Available Storage (m)

TCS - Traffic Control Signal

TWSC - Two-Way Stop Control

AWSC - All-Way Stop Control

< / > - Shared with through movement



3 Development Concept

3.1 Description

The subject site is located in the northwest quadrant of Columbia Way and Mount Hope Road in the Town of Caledon. The parcel is currently undeveloped.

The property owner is proposing to create a residential subdivision with a commercial block, containing up to 1,016 units. This will be a mix of detached homes, townhouses, apartments, and block townhouses. The commercial land parcel spans approximately 1.72 hectares (17,200 m²). The land coverage was assumed to be 25% with a one-story building, resulting in a gross floor area of 4,200 m² (XX sq.ft.).

Vehicle access is proposed via a new access road on Columbia Way (Street A, opposite Westchester Boulevard), two new access roads on Mount Hope Road (Street B and Street C), and two new driveways onto Mount Hope Road (the north and south ends of Street L). **Figure 3.1** illustrates the site concept plan.

3.2 Site-Generated Traffic

The Institute of Transportation Engineers (ITE) Trip Generation Manual⁹ provides rates and equations used to estimate the peak hour traffic volumes. The ITE provides information on average pass-by rates for LUC 822. Pass-by rates were applied to the trips generated by the commercial land use.

Pass-by trips are a subset of a trip generation that only applies to commercial/retail developments. These trips are already on the roadway, which businesses attract them to their Site as they pass by. The estimates of pass-by trips were derived using the Trip Generation Handbook published by ITE.

An example of a pass-by trip is a vehicle driving from home to work and stopping for coffee. It is noted that pass-by trips are already included in the background traffic stream and do not load additional traffic onto the road network.

⁹ Institute of Transportation Engineers Trip Generation Manual 11th Edition, 2021.



Table 3.1 summarizes the forecast number of net new trips generated by the proposed development. The full ITE Trip Generation Manual report is shown in **Appendix E**.

Figure 3.2 and **Figure 3.3** illustrate the site-generated traffic volumes for the AM and PM peak hours, respectively



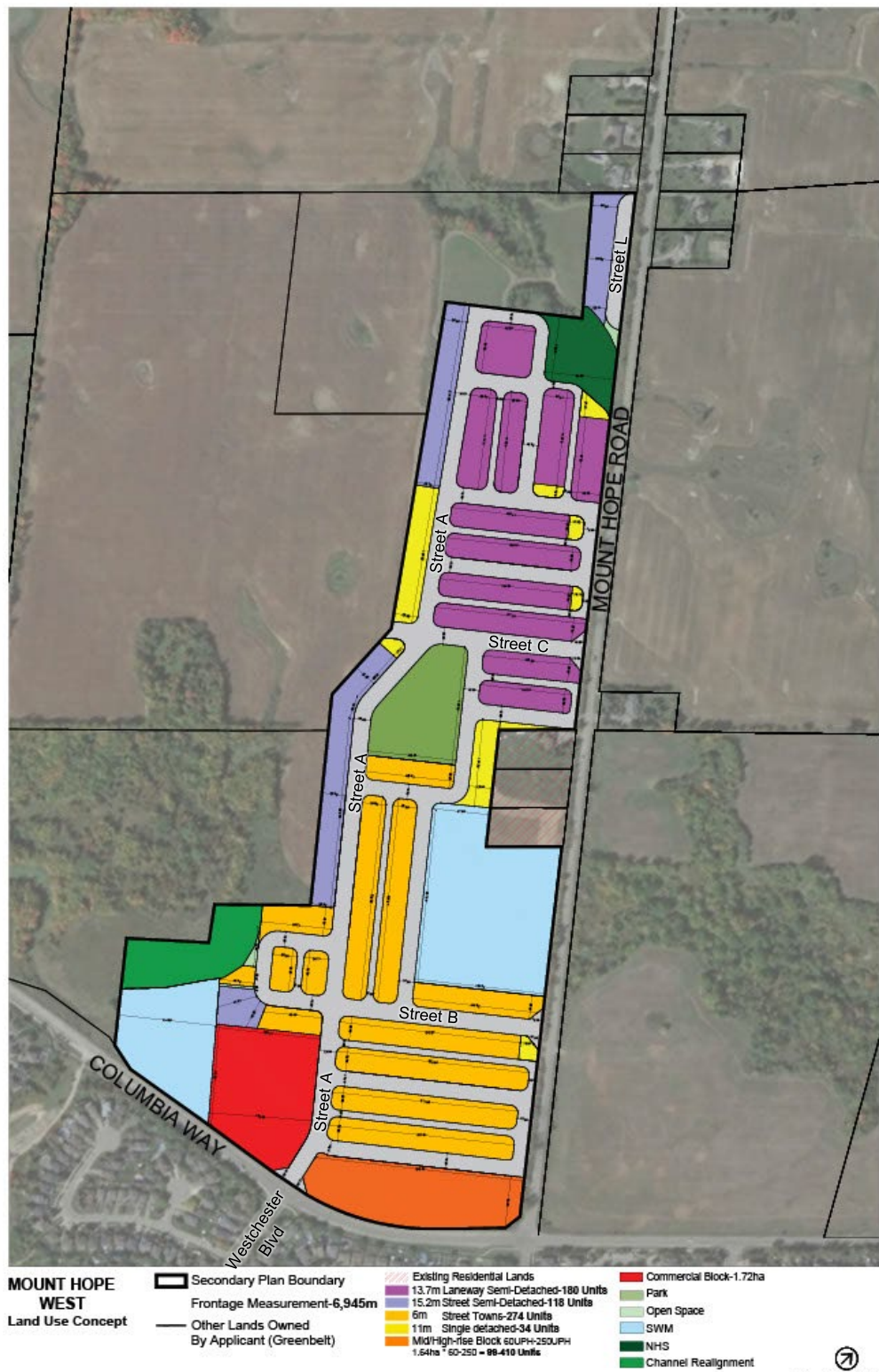
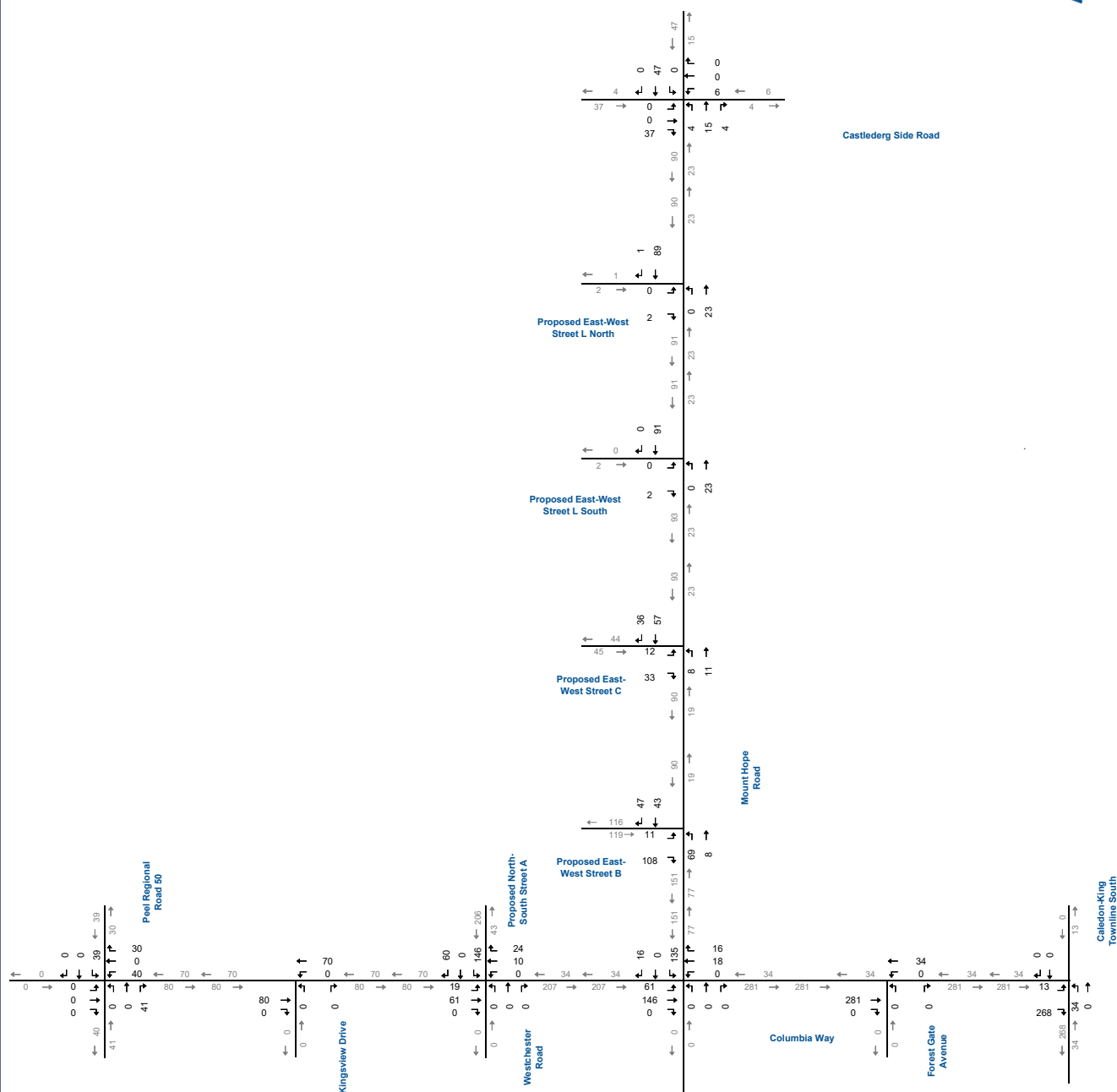


TABLE 3.1: TRIP GENERATION

Land Use Code	Amount	AM Peak Hour					PM Peak Hour				
		%	In	%	Out	Total	%	In	%	Out	Total
210: Single-Family Detached Housing	34 Units	26	7	74	21	28	63	23	37	13	36
215: Single-Family Attached Housing	180 Units	25	22	75	66	88	59	61	41	43	104
215: Single-Family Attached Housing	118 Units	25	14	75	42	56	59	39	41	28	67
215: Single-Family Attached Housing	274 Units	25	34	75	103	137	59	95	41	65	160
222: Multifamily Housing (High-Rise) Not Close to Rail	410 Units	26	28	74	81	109	62	80	38	50	130
821: Shopping Plaza (40-150k) - Supermarket - Yes	45.20 x1000 Sq. ft	62	99	38	61	160	48	223	52	243	466
Total Trips (Vehicle)			204		374	578		521		442	963
<i>Pass-By Trips (ITE 821)</i>		<i>0%</i>	<i>0</i>		<i>0</i>	<i>0</i>	<i>40%</i>	<i>93</i>		<i>93</i>	<i>186</i>
Net Total Trips			204		374	578		428		349	777

LUC 210 AM: $\ln(T) = 0.91 \ln(X) + 0.12$ PM: $\ln(T) = 0.94 \ln(X) + 0.27$
LUC 215 AM: $T = 0.52(X) - 5.70$ PM: $T = 0.60(X) - 3.93$
LUC 220 AM: $T = 0.31(X) + 22.85$ PM: $T = 0.43(X) + 20.55$
LUC 221 AM: $T = 0.44(X) - 11.61$ PM: $T = 0.39(X) + 0.34$
LUC 222 AM: $T = 0.22(X) + 18.85$ PM: $T = 0.26(X) + 23.12$
LUC 821 AM: Average Rate: 3.53 PM: $T = 7.67(X) + 118.86$





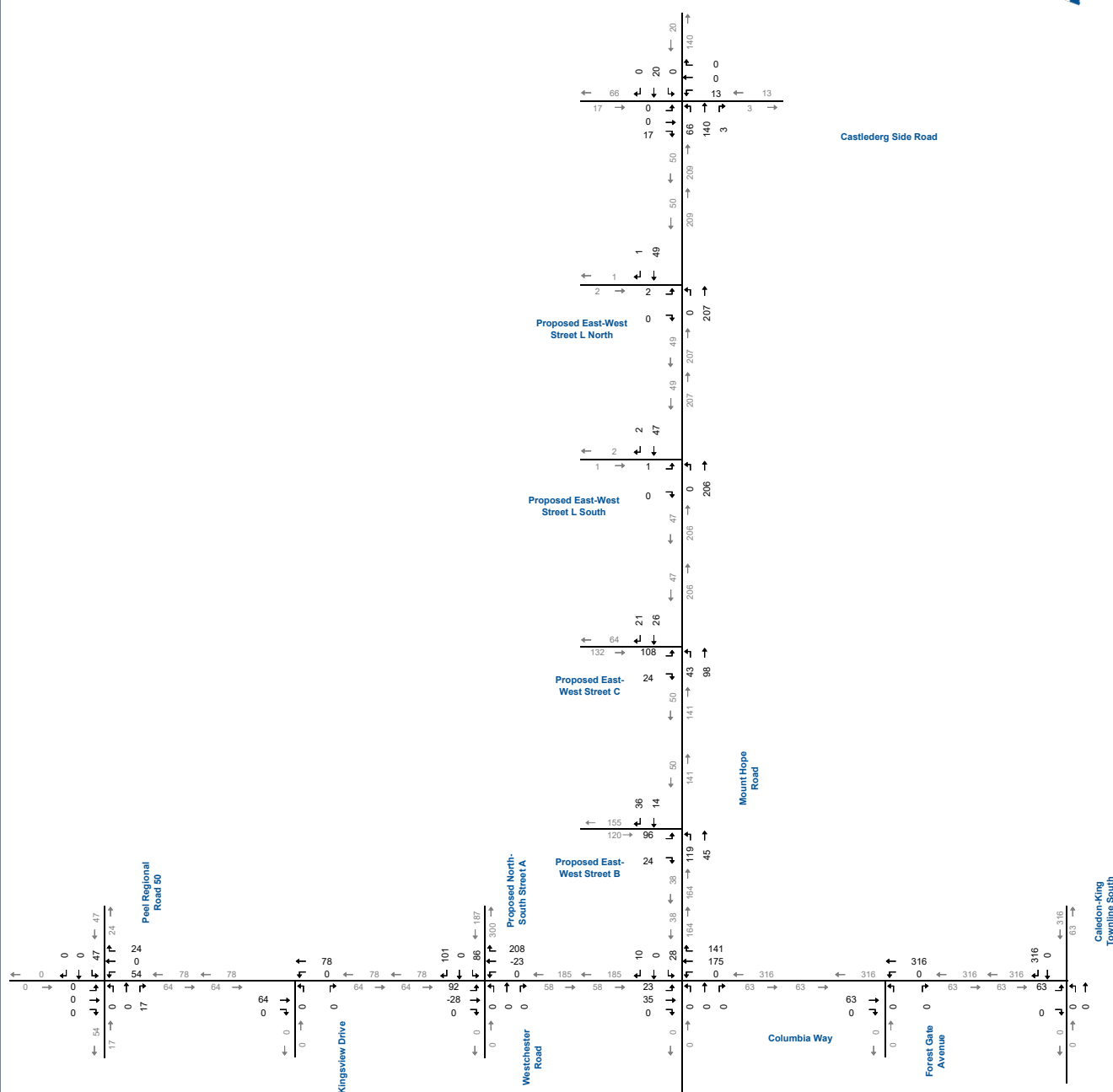


Table 3.2 and **Table 3.3** summarize the estimated trip distribution. The distribution was developed using data from the Transportation Tomorrow Survey.¹⁰ Trips were assigned to the network based on the likely routes vehicles would take to travel to and from their destination and origin, respectively. The site lies in TTS zone 3003; this zone contains relatively little development. Data from the nearby zone 3193 was also used as it includes detached single-family houses and low-density residential developments similar to the proposed development. Trips were assigned to the network based on the likely routes which vehicles would take to travel to/from their destination/origin. As the development is an expansion to an existing development with the same land use, it's assumed that the distribution will be consistent.

TABLE 3.2: TRIP DISTRIBUTION –TRIPS TO SITE

Origin	AM Peak Hour	PM Peak Hour
South of Caledon King Townline	17%	74%
East of Castlederg	3%	3%
North of Highway 50	19%	11%
West of Castlederg	18%	4%
South of Highway 50	20%	4%
North of Mount Hope	23%	4%
Total	100%	100%

¹⁰ *Transportation Tomorrow Survey*, University of Toronto Data Management Group, 2016.



TABLE 3.3: TRIP DISTRIBUTION – TRIPS FROM SITE

Destination	AM Peak Hour	PM Peak Hour
North via Mount Hope	4%	39%
North via Highway 50	8%	7%
North via Caledon King Townline	3%	18%
South via Caledon King Townline	72%	0%
South via Highway 50	11%	16%
West via Castlederg	1%	19%
East via Castlederg	1%	1%
<i>Total</i>	<i>100%</i>	<i>100%</i>



4 Future Traffic Conditions

The assessment of future conditions in this section includes the following components:

- ▶ Forecast background traffic volumes;
- ▶ Forecast total traffic volumes;
- ▶ Level of service analysis for background traffic (pre-development); and
- ▶ Level of service analysis for total traffic (post-development).

4.1 Forecast Background Traffic Volumes

Per the Town of Caledon Transportation Services office, future scenarios were analyzed for two horizons 2028 and 2033. The future traffic volumes near the subject site are estimated to consist of:

- ▶ Generalized background traffic growth; and
- ▶ Traffic from other nearby sites.

The traffic background developments were identified to be included in the background traffic forecast. **Table 4.1** summarizes the status of each site, the development concept (if known), and whether a relevant traffic impact study was/is available for each site. The background developments have been identified to be developed by the 2028 horizon and are included in all background traffic forecasts.

Town of Caledon staff stipulated an annual background traffic growth rate of 2% for the roadways in the study area. The growth rate was only applied to the main roads and not any of the local roads or site access points. **Appendix A** contains the pre-study consultation material and comments provided by Town staff.



TABLE 4.1: BACKGROUND DEVELOPMENTS

Development	Development Concept	TIS Available
Hi-Lands of Bolton	143 residential units (140 residential townhouse detached units and 3 single family detached houses)	Yes
Bolton North Hill Option 1 & Option 2 Lands	Local Official Plan Amendment (LOPA) for the Bolton North Hill Secondary Plan Option 1 and 2. The Site consists of approximately 175.3 ha (433 acres). The development will include 2,165 residential townhouse, 417 Apartments, and 1,554 single family detached houses	Yes
Columbia Square	Planned as a mixed-use development including residential and commercial uses. The development project is divided into three phases. Phase 1 includes 24 units of single-family attached housing and 118 units of low-rise multifamily housing. Phase 2 consists of 244 units of mid-rise multifamily housing and a strip retail plaza with a gross floor area of 19,741 square feet. Phase 3 features 159 units of mid-rise multifamily housing.	Yes



4.2 Forecast Total Traffic Volumes

The future traffic volumes near the subject site are estimated to consist of:

- ▶ Increased non-site traffic (generalized background traffic growth and traffic from other sites); and
- ▶ Traffic generated by the subject site.

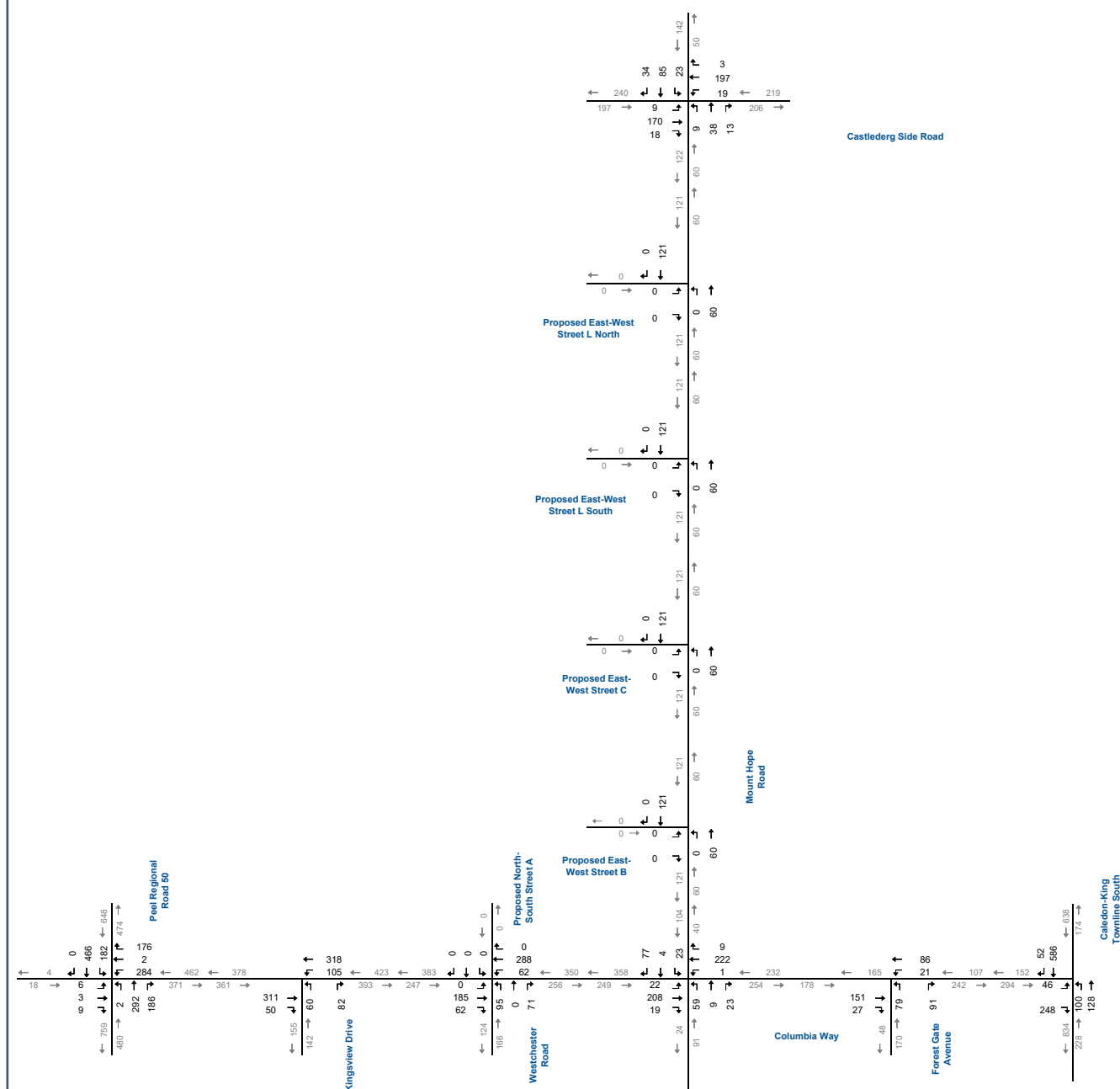
Figure 4.1 and **Figure 4.2** illustrate the AM and PM peak hour 2028 background traffic volumes respectively, including road traffic growth.

Figure 4.3 and **Figure 4.4** illustrate the AM and PM peak hour 2033 background traffic volumes respectively, including road traffic growth.

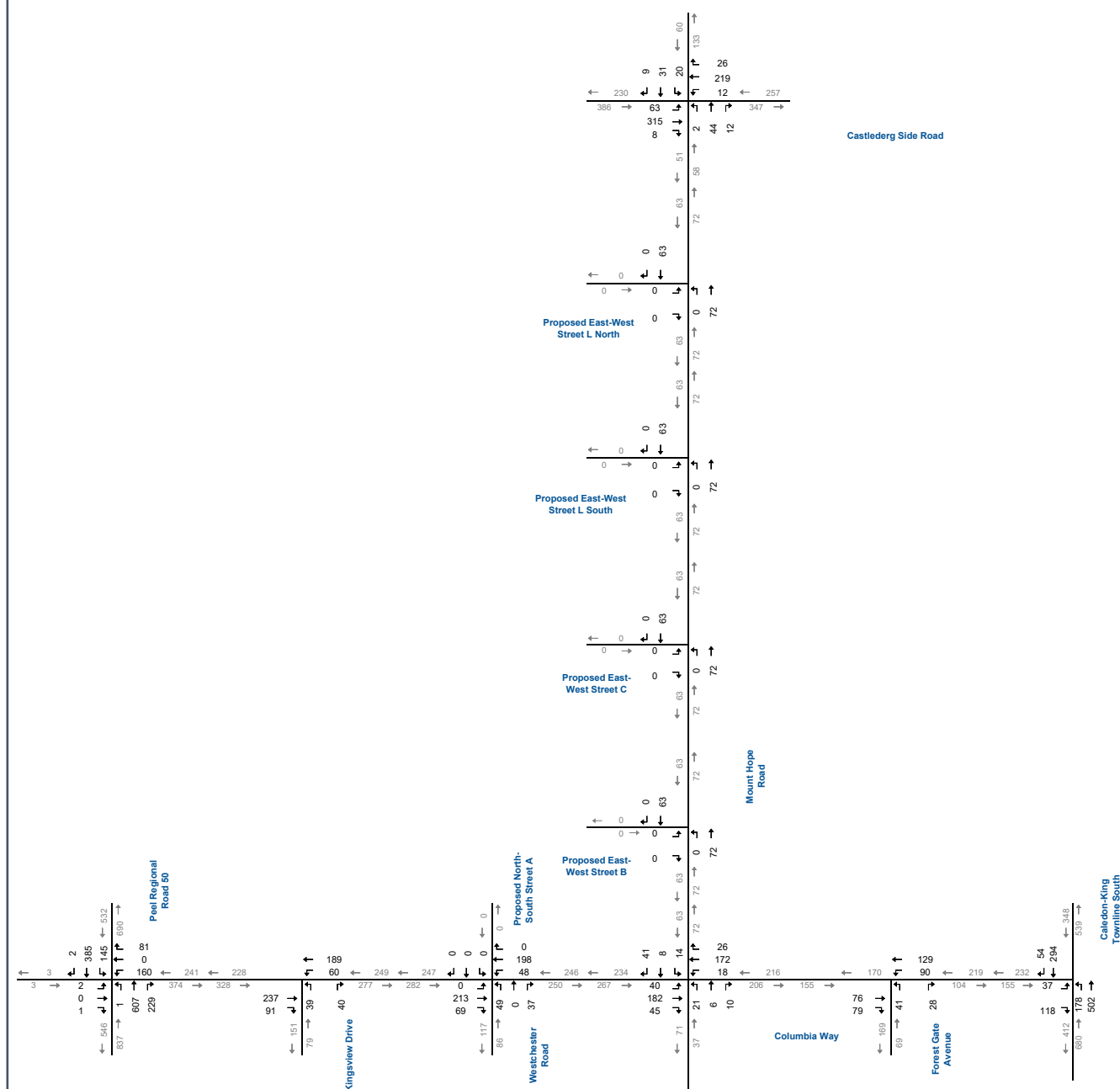
Figure 4.5 and **Figure 4.6** illustrate the AM and PM peak hour 2028 total traffic volumes respectively, including 2028 background traffic volumes plus trips generated by the proposed development.

Figure 4.7 and **Figure 4.8** illustrate the AM and PM peak hour 2033 total traffic volumes respectively, including 2033 background traffic volumes plus trips generated by the proposed development.

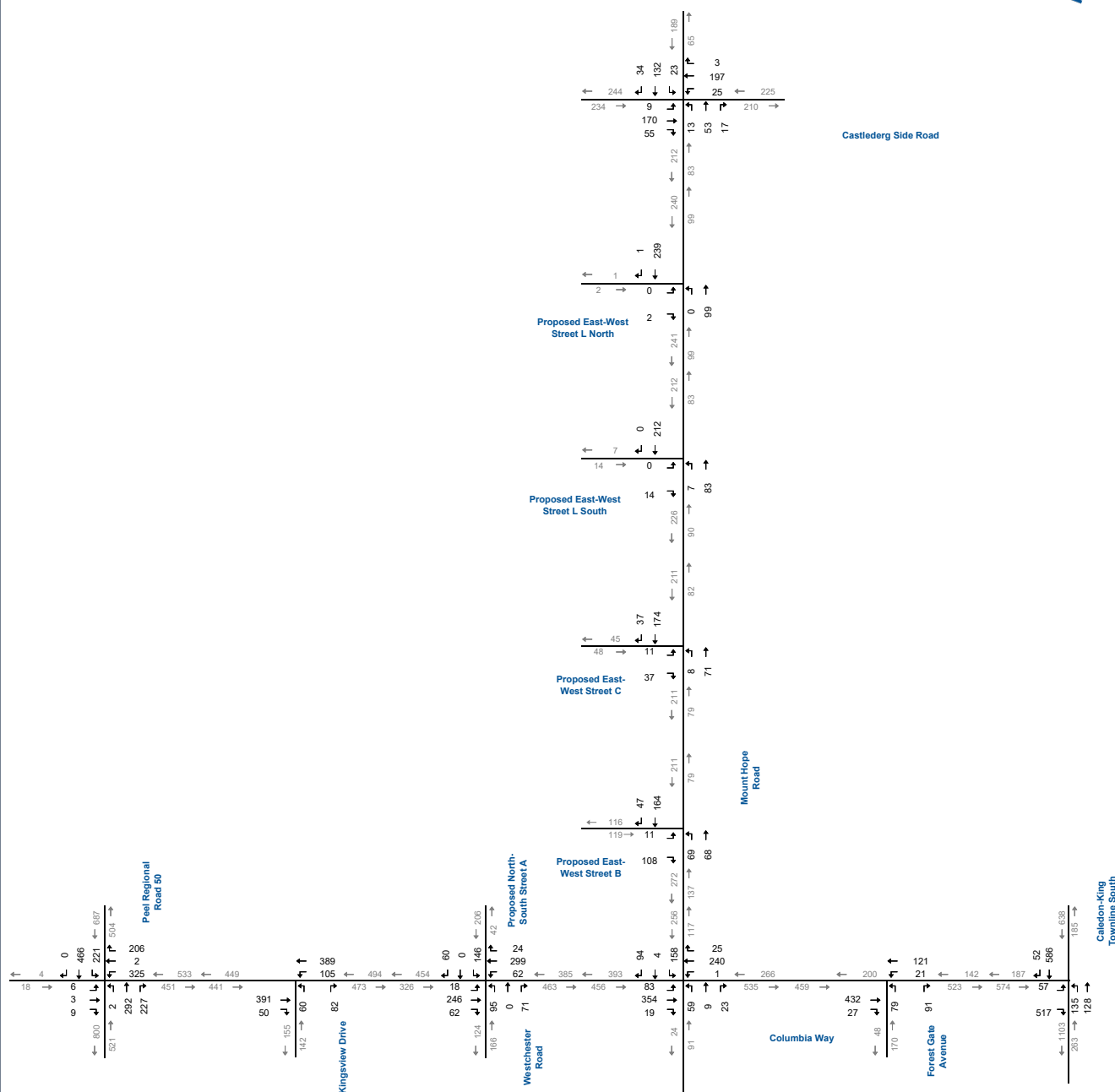


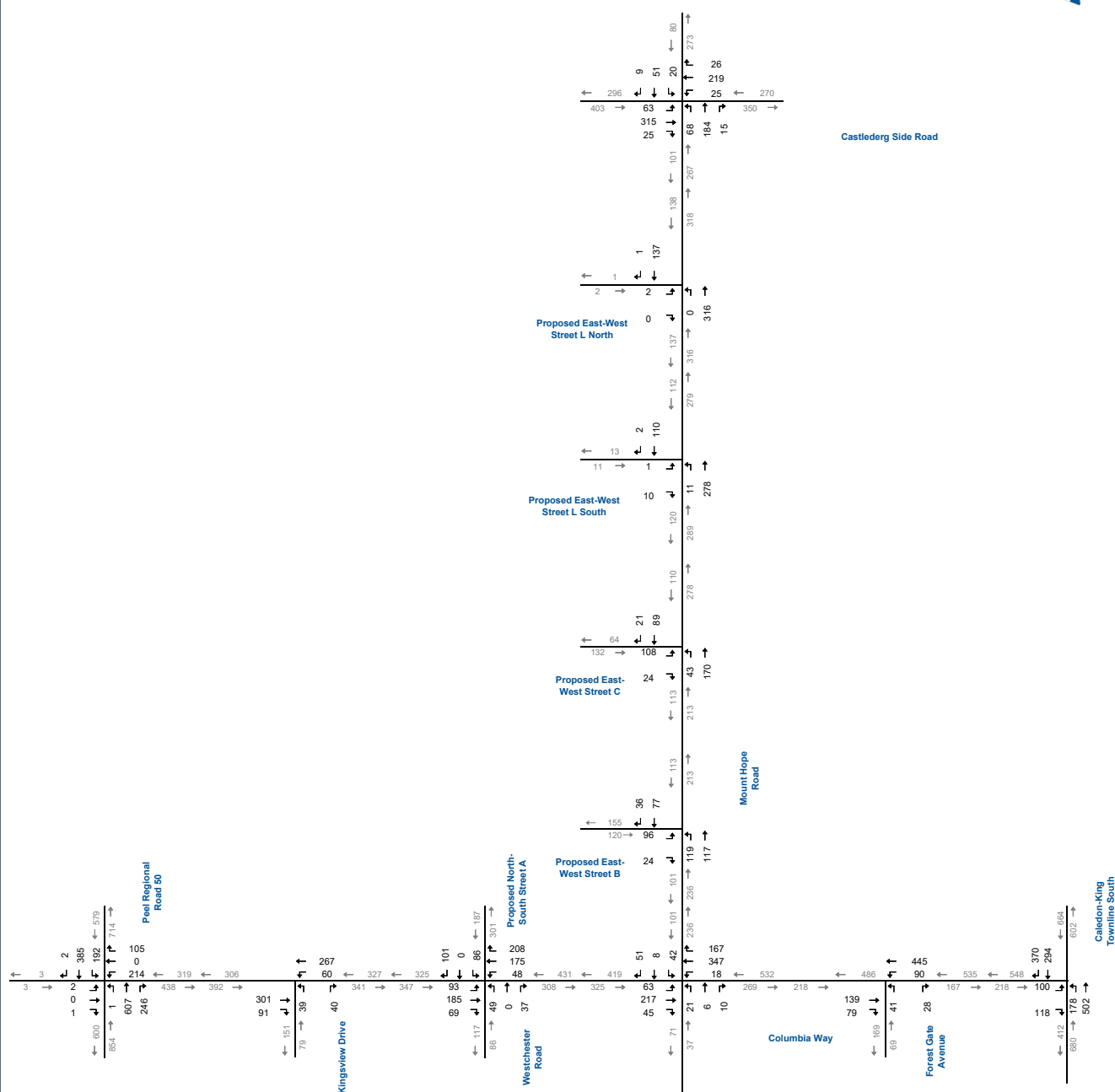


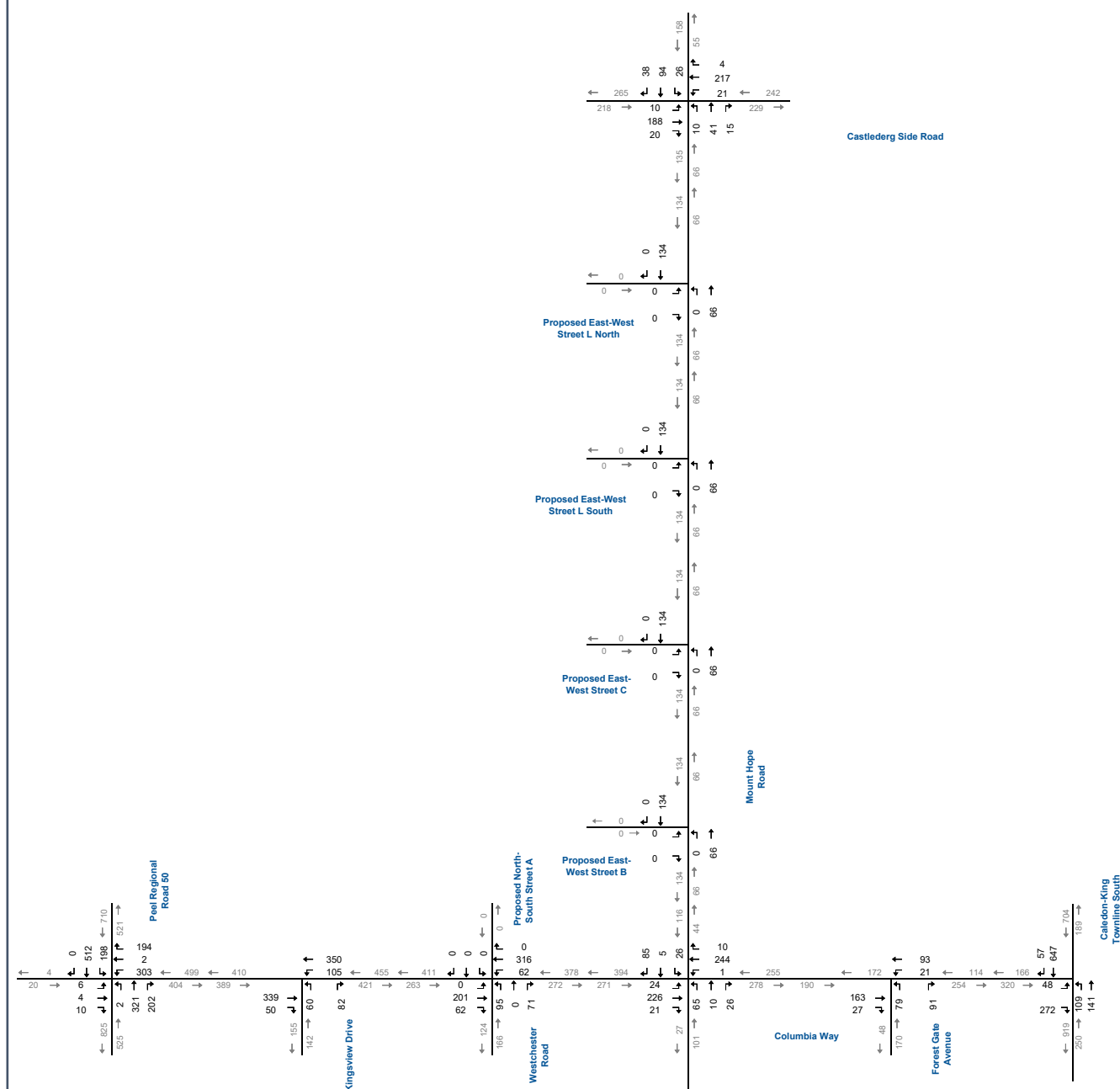
2028 Background Traffic Volumes AM Peak Hour



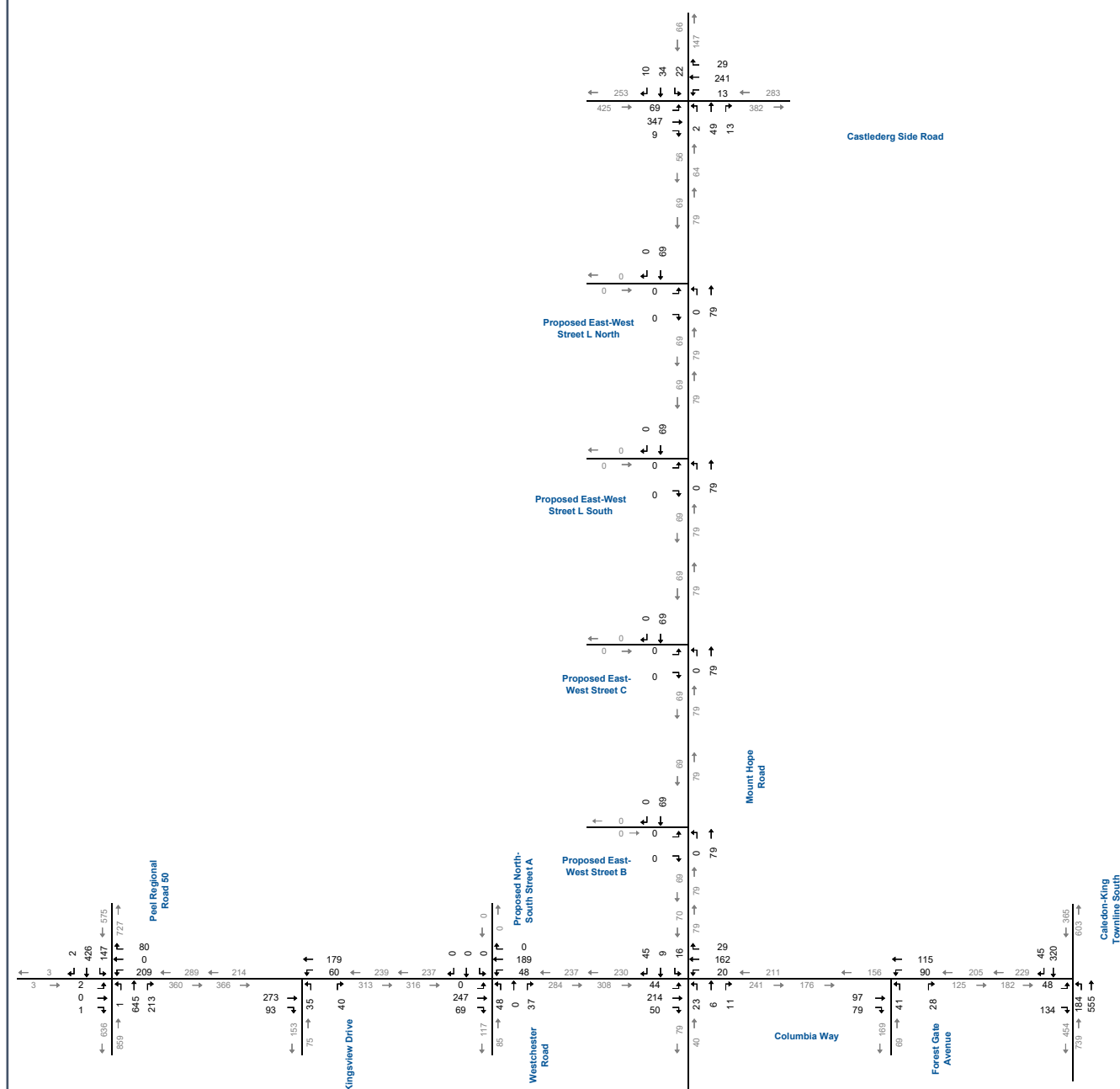
2028 Background Traffic Volumes PM Peak Hour



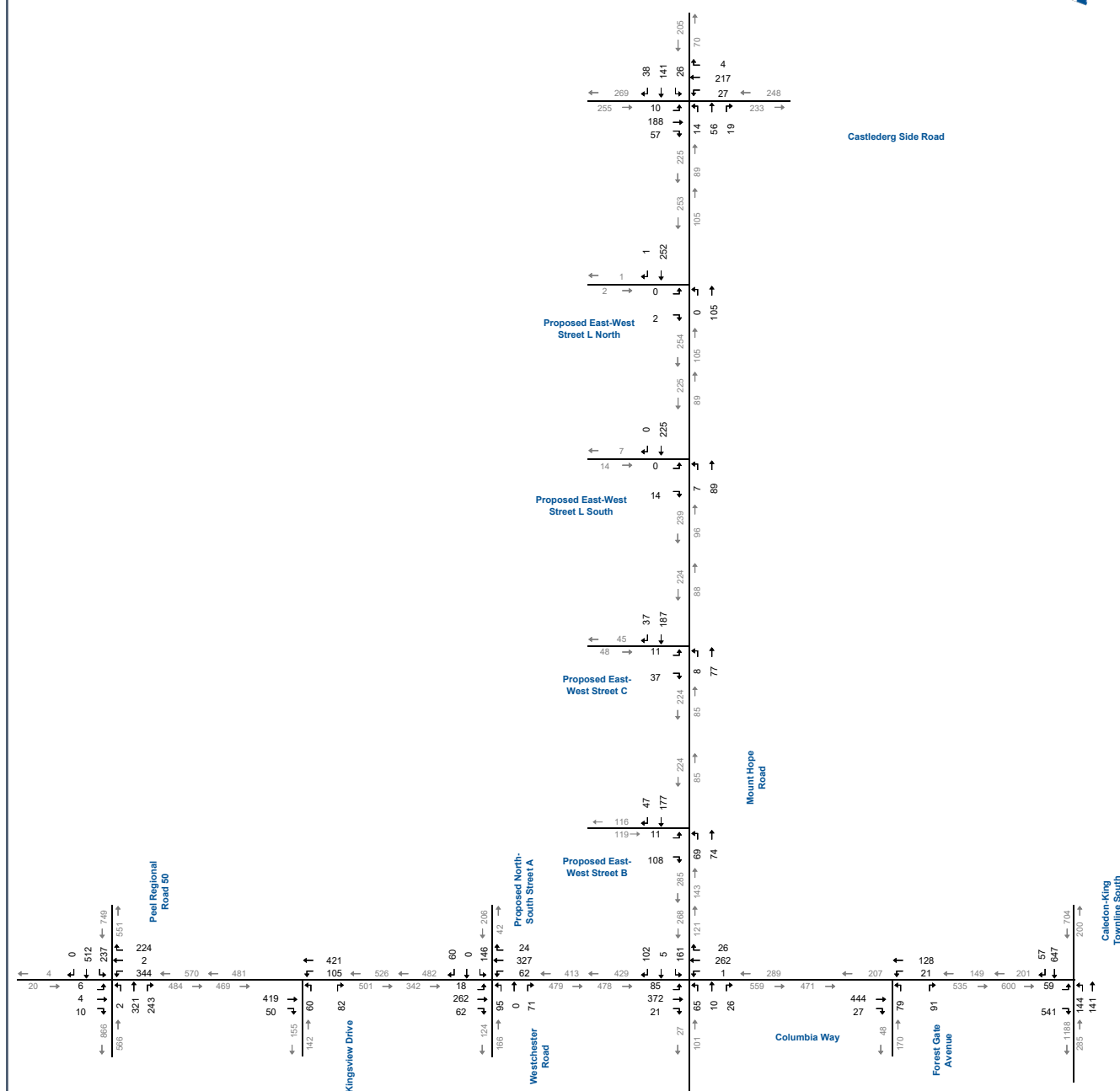


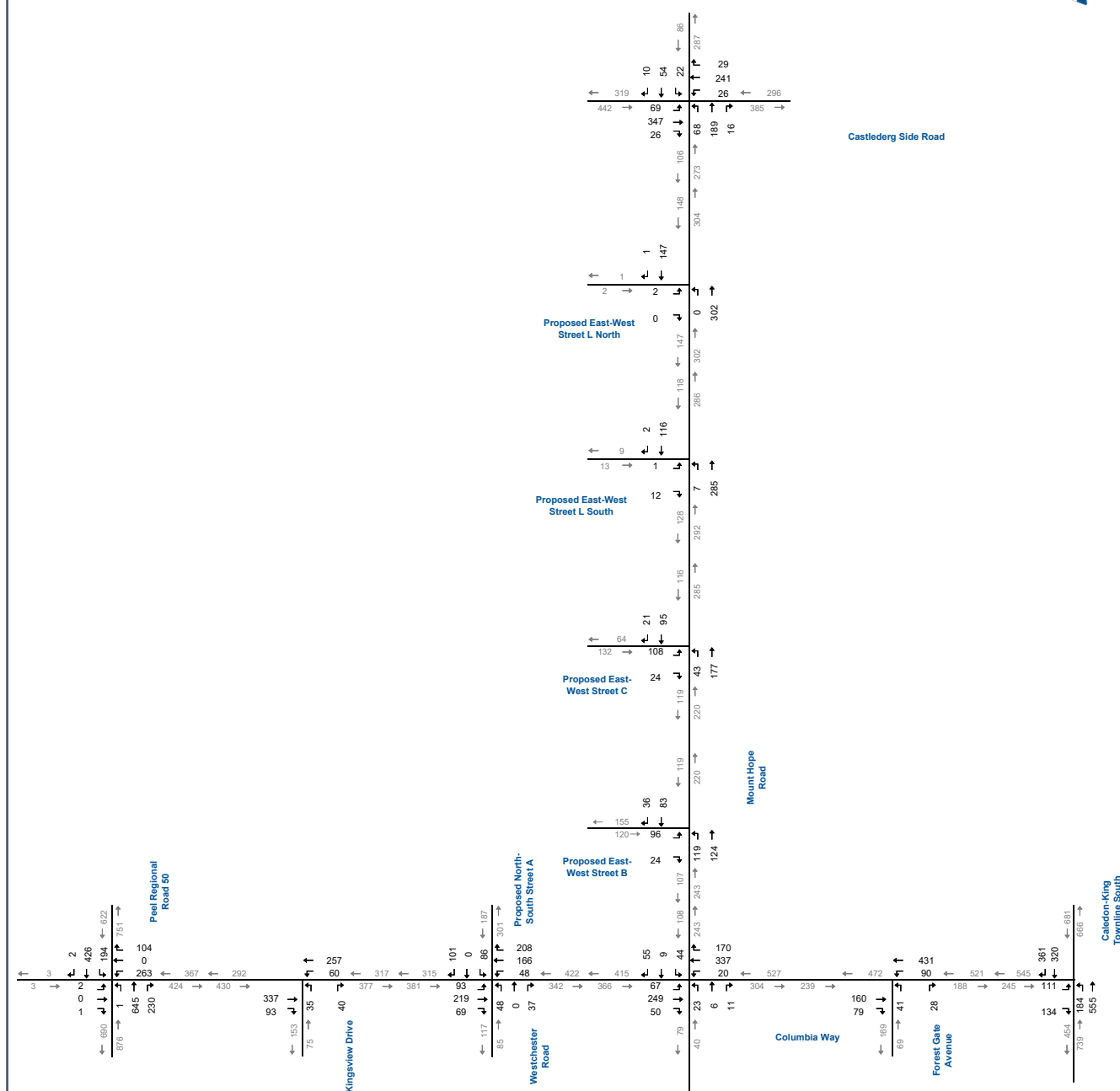


2033 Background Traffic Volumes AM Peak Hour



2033 Background Traffic Volumes PM Peak Hour





4.3 Traffic Operations

The study area intersection operations analyses followed the same methodology used for existing conditions. No changes to the existing lane configurations or traffic control are assumed.

4.3.1 2028 Background Traffic

Table 4.2 and **Table 4.3**, summarize the level of service conditions for the 2028 background traffic volumes in the AM and PM peak periods respectively.

Appendix F contains the detailed Synchro reports.

The following additional critical movements are forecast in the 2028 background traffic intersection operations that were not present in the existing traffic intersection operations:

- ▶ Highway 50 [Peel Regional Road 50] & Columbia Way:
 - The westbound left queue length is forecast to exceed available storage by 29m during the AM peak hour.

Otherwise, all vehicle movements at intersections within the study area are operating with acceptable delays, levels of service, and within capacity.



TABLE 4.2: 2028 AM BACKGROUND TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Hwy 50 [Peel Regional Road 50] & Columbia Way	TCS	LOS Delay V/C Q Stor. Avail.	< < < < <	C 27 0.04 6 -	> > > > >	C 27 0.87 89 60 -29	D 54 0.16 10 -	> > > > >	D 44 0.15 7 300 293	A 10 0.01 2 136 134	B 13 0.37 59 -	B 11 0.15 7 300 293	B 12 0.46 46 85 39	B 16 0.55 101 - 25	A 0 0.00 0 25 25	B 16 0.16 0 25 25	C 23 0.66		
	Kingsview Drive & Columbia Way	TCS	LOS Delay V/C Q		A 7 0.43 46	> > > > >	A 7 0.43 46	< < < < <	B 12 0.68 70		B 12 0.66 32	D 47	> > > > >	D 47					A 7 0.68	
	Westchester Road & Columbia Way	TWSC	LOS Delay V/C Q		A 0 0.22 0	> > > > >	A 0 0.22 0	< < < < <	A 2 0.08 2		A 2 0.73 44	E 38	> > > > >	E 38					A 9 0.52	
	Mount Hope Road & Columbia Way	TWSC	LOS Delay V/C Q	< < < < <	A 1 0.03 1	> > > > >	A 1 0.03 1	< < < < <	A 0 0.00 0	> > > > >	A 0	< < < < <	D 28 0.46 18	> > > > >	D 28	< < < < <	B 15 0.30 10	> > > > >	B 15 0.47	
	Caledon-King Townline South & Columbia Way	TWSC	LOS Delay V/C	E 42 0.81		> > > > >	E 42					< < < < <	A 5 0.12		A 5		A 0 0.41	> > > > >	A 0 0.74	
	Mount Hope Road & Castlederg Side Road	AWSC	LOS Delay V/C Q	< < < < <	B 10 0.33	> > > > >	B 10	< < < < <	B 11 0.36	> > > > >	B 11	< < < < <	A 9 0.11	> > > > >	A 9	< < < < <	A 10 0.24	> > > > >	A 10 0.35	
	Forest Gate Avenue & Columbia Way	TWSC	LOS Delay V/C Q		A 0 0.12 0	> > > > >	A 0	< < < < <	A 2 0.02 0		A 2 0.27 9	B 12	> > > > >	B 12					A 5 0.35	

MOE - Measure of Effectiveness

LOS - Level of Service

Delay - Average Delay per Vehicle in Seconds

V/C - Volume to Capacity Ratio

Q - 95th Percentile Queue Length (m)

Stor. - Existing Storage (m)

Avail. - Available Storage (m)

TCS - Traffic Control Signal

TWSC - Two-Way Stop Control

AWSC - All-Way Stop Control

< / > - Shared with through movement



TABLE 4.3: 2028 PM BACKGROUND TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																	
				Eastbound				Westbound				Northbound				Southbound				Overall	
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		
PM Peak Hour	Hwy 50 [Peel Regional Road 50] & Columbia Way	TCS	LOS Delay V/C Q Stor. Avail.	< < < < <	C 34 0.00 0 -	> > > > >	C 34	D 47 0.69 51 60 9	C 35 0.06 0 -	> > > > >	D 43	A 4 0.00 1 136 135	A 8 0.49 96 -	A 5 0.15 8 300 292	A 7	A 8 0.32 27 85 58	A 6 0.31 53 -	A 4 0.00 0 25 25	A 7	B 13 0.53	
	Kingsview Drive & Columbia Way	TCS	LOS Delay V/C Q		A 4 0.26 24	> > > > >	A 4	< < < < <	A 4 0.23 22		A 4	C 31 0.27 17		> > > > >	C 31						A 7 0.26
	Westchester Road & Columbia Way	TWSC	LOS Delay V/C Q		A 0 0.18 0	> > > > >	A 0	< < < < <	A 2 0.04 1		A 2	B 13 0.17 5		> > > > >	B 13						A 3 0.44
	Mount Hope Road & Columbia Way	TWSC	LOS Delay V/C Q	< < < < <	A 1 0.03 1	> > > > >	A 1	< < < < <	A 1 0.01 0	> > > > >	A 1	< < < < <	B 14 0.09 2	> > > > >	B 14	< < < < <	B 12 0.11 3	> > > > >	B 12	A 3 0.35	
	Caledon-King Townline South & Columbia Way	TWSC	LOS Delay V/C	C 21 0.42		> > >	C 21					< < <	A 4 0.15		A 4		A 0 0.21	> > >	A 0	A 5 0.74	
	Mount Hope Road & Castlederg Side Road	AWSC	LOS Delay V/C Q	< < < < <	B 13 0.53	> > > > >	B 13	< < < < <	B 11 0.37	> > > > >	B 11	< < < < <	A 9 0.10	> > > > >	A 9	< < < < <	A 9 0.10	> > > > >	A 9	B 12 0.54	
	Forest Gate Avenue & Columbia Way	TWSC	LOS Delay V/C Q		A 0 0.10 0	> > > > >	A 0	< < < < <	A 4 0.07 2		A 4	B 12 0.13 4		> > > > >	B 12						A 4 0.35

MOE - Measure of Effectiveness

LOS - Level of Service

Delay - Average Delay per Vehicle in Seconds

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Q - 95th Percentile Queue Length (m)

Stor. - Existing Storage (m)

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< / > - Shared with through movement



4.3.2 2028 Total Traffic

Figure 4.3 and **Figure 4.4** summarize the level of service conditions for the 2028 total traffic volumes in the AM and PM peak periods respectively. **Appendix G** contains the detailed Synchro reports.

The following additional critical movements are forecast in the 2028 total traffic scenario that were not present in the 2028 background traffic scenario:

- ▶ Columbia Way & Westchester Road/Proposed North-South Road:
 - The northbound approach, northbound through movement, southbound approach and southbound through movement are forecast to operate with an Operate with delays in the LOS F range during the AM peak hour with a v/c ratio greater than 1.00.
 - The northbound through and southbound through movements are forecast with an unacceptable V/C ratio during the AM peak hour.
- ▶ Mount Hope Road & Columbia Way:
 - The northbound approach, northbound through movement, southbound approach and southbound through movement are forecast to operate with an unacceptable LOS F during the AM peak hour.
 - The southbound through is also forecast to operate with an unacceptable V/C ratio during the AM peak hour
 - The overall intersection is forecast to operate with an unacceptable LOS F during the AM peak hour.
- ▶ Caledon-King Townline South & Columbia Way:
 - The overall intersection is forecast to operate with an unacceptable LOS F during the AM peak hour;
 - The eastbound left is forecast to operate with an unacceptable LOS F during both peak hours with an unacceptable V/C ratio;
 - The eastbound approach is forecast to operate with an unacceptable LOS F during both peak hours.
- ▶ Highway 50 [Peel Regional Road 50] & Columbia Way:
 - The westbound queue length is forecast to exceed available storage by 4m during the PM peak hour.



Otherwise, all vehicle movements at intersections within the study area are operating with acceptable delays, levels of service, and within capacity.



TABLE 4.4: 2028 AM TOTAL TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Hwy 50 [Peel Regional Road 50] & Columbia Way	TCS	LOS Delay V/C Q Stor. Avail.	< < < <	C 25 0.04 6 -	> > > >	C 25 0.92 106 60 -46	E 60 0.18 10 60 -	> > > >	D 47	B 11 0.01 2 136 134	B 15 0.39 59 7 300 293	B 13 0.19 7 300 293	B 14	C 22 0.59 59 85 26	B 18 0.57 101 -	A 0 0.00 25 25	B 19	C 26 0.71	
	Kingsview Drive & Columbia Way	TCS	LOS Delay V/C Q	< < < <	A 8 0.53 59	> > > >	A 8	< < < <	C 21	D 47 0.66 32	> > > >	D 47	< < < <	< < < <	< < < <	< < < <	< < < <	< < < <	B 19 0.82	
	Westchester Road/Proposed North-South Street A & Columbia Way	TWSC	LOS Delay V/C Q	< < < <	A 0 0.02 0	> > > >	A 0	< < < <	A 2	< < < <	F 207 1.28 111	> > > >	F 207	< < < <	< < < <	F 310 1.50 119	> > > >	F 310	F 80 0.61	
	Mount Hope Road & Columbia Way	TWSC	LOS Delay V/C Q	< < < <	A 3 0.11 3	> > > >	A 3	< < < <	A 0	< < < <	F 145 1.00 57	> > > >	F 145	< < < <	< < < <	F 527 2.04 228	> > > >	F 527	F 140 0.66	
	Caledon-King Townline South & Columbia Way	TWSC	LOS Delay V/C Q	F 280 1.54 274	< < < <	> > > >	F 280	< < < <	< < < <	< < < <	A 6	< < < <	A 6	< < < <	< < < <	A 0	> > > >	A 0	F 110 0.93	
	Mount Hope Road & Proposed East-West Street C	TWSC	LOS Delay V/C Q	A 10 0.07 2	< < < <	> > > >	A 10	< < < <	< < < <	< < < <	A 1	< < < <	A 1	< < < <	< < < <	A 0	> > > >	A 0	A 2 0.21	
	Mount Hope Road & Proposed East-West Street B	TWSC	LOS Delay V/C Q	B 10 0.16 5	< < < <	> > > >	B 10	< < < <	< < < <	< < < <	A 4	< < < <	A 4	< < < <	< < < <	A 0	> > > >	A 0	A 4 0.36	
	Mount Hope Road & Castlederg Side Road	AWSC	LOS Delay V/C	< < <	B 12 0.41	> > >	B 12	< < <	B 12 0.40	> > >	B 12	< < <	B 10 0.16	> > >	B 10	< < <	B 12 0.35	> > >	B 12	B 12 0.40
	Forest Gate Avenue & Columbia Way	TWSC	LOS Delay V/C Q	< < < <	A 0 0.31 0	> > > >	A 0	< < < <	A 1 0.02 1	> > > >	A 1	C 18 0.42 17	< < < <	C 18	< < < <	< < < <	< < < <	< < < <	< < < <	A 4 0.41
	Mount Hope Road & Mount Hope Road & Proposed East-West Street L North	TWSC	LOS Delay V/C Q	A 10 0.00 0	< < < <	> > > >	A 10	< < < <	< < < <	< < < <	< < < <	A 0 0.00 0	< < < <	A 0	< < < <	< < < <	A 0 0.15 0	> > > >	A 0	A 0 0.23
	Mount Hope Road & Mount Hope Road & Proposed East-West Street L South	TWSC	LOS Delay V/C Q	A 10 0.02 0	< < < <	> > > >	A 10	< < < <	< < < <	< < < <	< < < <	A 1 0.01 0	< < < <	A 1	< < < <	< < < <	A 0 0.14 0	> > > >	A 0	A 1 0.21

MOE - Measure of Effectiveness

LOS - Level of Service

Delay - Average Delay per Vehicle in Seconds

V/C - Volume to Capacity Ratio

Q - 95th Percentile Queue Length (m)

Stor. - Existing Storage (m)

Avail. - Available Storage (m)

TCS - Traffic Control Signal

TWSC - Two-Way Stop Control

AWSC - All-Way Stop Control

< / > - Shared with through movement



TABLE 4.5: 2028 PM TOTAL TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																	
				Eastbound				Westbound				Northbound				Southbound				Overall	
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		
PM Peak Hour	Hwy 50 [Peel Regional Road 50] & Columbia Way	TCS	LOS Delay V/C Q Stor. Avail.	< < < < <	C 31 0.00 0 -	> > > > >	C 31 64 60 -4	D 48 0.76 0 -	C 32 0.07 0 -	> > > > >	D 42	A 6 0.00 1 136 135	B 10 0.52 110 -	A 7 0.16 10 300 290	A 9	B 12 0.47 46 85 39	A 8 0.33 61 -	A 6 0 25 25	A 9	B 15	
	Kingsview Drive & Columbia Way	TCS	LOS Delay V/C Q		A 4 0.31 31	> > > > >	A 4	< < < < <	A 4			A 4	C 31 0.27 17		> > > > >	C 31					A 7
	Westchester Road/Proposed North-South Street A & Columbia Way	TWSC	LOS Delay V/C Q	< < < < <	A 3 0.09 2	> > > > >	A 3	< < < < <	A 1	> > > > >	A 1	< < < < <	D 25 0.35 12	> > > > >	D 25	< < < < <	D 27 0.56 26	> > > > >	D 27	A 8 0.56	
	Mount Hope Road & Columbia Way	TWSC	LOS Delay V/C Q	< < < < <	A 2 0.07 2	> > > > >	A 2	< < < < <	A 0	> > > > >	A 0	< < < < <	C 22 0.15 4	> > > > >	C 22	< < < < <	C 20 0.32 11	> > > > >	C 20	A 4 0.57	
	Caledon-King Townline South & Columbia Way	TWSC	LOS Delay V/C Q	F 137 1.09 84		> > > > >	F 137					< < < < <	A 5 0.20 6		A 5		A 0 0.41 0	> > > > >	A 0	C 21 0.97	
	Mount Hope Road & Proposed East-West Street C	TWSC	LOS Delay V/C Q	B 12 0.22 7		> > > > >	B 12					< < < < <	A 2 0.03 1		A 2		A 0 0.07 0	> > > > >	A 0	A 4 0.32	
	Mount Hope Road & Proposed East-West Street B	TWSC	LOS Delay V/C Q	B 14 0.24 7		> > > > >	B 14					< < < < <	A 4 0.09 2		A 4		A 0 0.07 0	> > > > >	A 0	A 6 0.33	
	Mount Hope Road & Castlederg Side Road	AWSC	LOS Delay V/C	< < <	C 20 0.68	> > >	C 20	< < <	B 14 0.48	> > >	B 14	< < <	C 15 0.50	> > >	C 15	< < <	B 11 0.16	> > >	B 11	C 17 0.60	
	Forest Gate Avenue & Columbia Way	TWSC	LOS Delay V/C Q		A 0 0.15 0	> > > > >	A 0	< < < < <	A 2			A 2	C 17 0.20 6		> > > > >	C 17					A 3 0.55
	Mount Hope Road & Mount Hope Road & Proposed East-West Street L North	TWSC	LOS Delay V/C Q	B 12 0.00 0		> > > > >	B 12					< < < < <	A 0 0.00 0		A 0		A 0 0.09 0	> > > > >	A 0	A 0 0.27	
	Mount Hope Road & Mount Hope Road & Proposed East-West Street L South	TWSC	LOS Delay V/C Q	A 9 0.01 0		> > > > >	A 9					< < < < <	A 0 0.01 0		A 0		A 0 0.07 0	> > > > >	A 0	A 0 0.32	

MOE - Measure of Effectiveness

LOS - Level of Service

Delay - Average Delay per Vehicle in Seconds

V/C - Volume to Capacity Ratio

Q - 95th Percentile Queue Length (m)

Stor. - Existing Storage (m)

Avail. - Available Storage (m)

TCS - Traffic Control Signal

TWSC - Two-Way Stop Control

AWSC - All-Way Stop Control

</> - Shared with through movement



4.3.3 2033 Background Traffic

Table 4.6 and **Table 4.7**, summarize the level of service conditions for the 2033 background traffic volumes in the AM and PM peak periods respectively. **Appendix H** contains the detailed Synchro reports.

The following additional critical movements are forecast in the 2033 background operations that were not present under 2028 background operations:

- ▶ Caledon-King Townline South & Columbia Way:
 - The eastbound left is forecast to operate with an unacceptable LOS F during AM peak hour;
 - The eastbound approach is forecast to operate with an unacceptable LOS F during AM peak hour.

Otherwise, all vehicle movements at intersections within the study area are operating with acceptable delays, levels of service, and within capacity.



TABLE 4.6: 2033 AM BACKGROUND TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Hwy 50 [Peel Regional Road 50] & Columbia Way	TCS	LOS Delay V/C Q Stor. Avail.	< < < < <	C 26 0.04 7 - -	> > > > >	C 26 97 60 -37	E 57 0.90 10 - -	C 27 > > >	D 45	B 10 0.01 2 136 134	B 15 0.41 66 -	B 12 0.17 7 300 293	B 14	B 20 0.55 53 85 32	B 18 0.61 114 -	A 0 0.00 0 25 25	B 19	C 25 0.71	
	Kingsview Drive & Columbia Way	TCS	LOS Delay V/C Q		A 7 0.47 50	> > > >	7 A	< < < <	B 14 0.74 80		14 B	D 47 0.66 32		> > >	47 D					B 16 0.73
	Westchester Road & Columbia Way	TWSC	LOS Delay V/C Q		A 0 0.24 0	> > > >	A 0	< < < <	A 2 0.09 2		A 2	E 47 0.79 51		> > >	E 47					B 11 0.54
	Mount Hope Road & Columbia Way	TWSC	LOS Delay V/C Q	< < < <	A 1 0.03 1	> > > >	A 1	< < < <	A 0 0.00 0	> > >	A 0	< < < <	E 37 0.58 26	> > >	E 37	< < <	C 17 0.36 13	> > >	C 17	A 8 0.51
	Caledon-King Townline South & Columbia Way	TWSC	LOS Delay V/C	F 75 0.97		> >	F 75					< < <	A 5 0.14		A 5		A 0 0.45	> > >	A 0	C 20 0.80
	Mount Hope Road & Castlederg Side Road	AWSC	LOS Delay V/C Q	< < < <	B 11 0.37	> > > >	B 11	< < < <	B 12 0.41	> > >	B 12	< < <	A 10 0.13	> > >	A 10	< < <	B 11 0.28	> > >	B 11	B 11 0.38
	Forest Gate Avenue & Columbia Way	TWSC	LOS Delay V/C Q		A 0 0.13 0	> > >	A 0	< < <	A 2 0.02 0		A 2	B 12 0.27 9		> > >	B 12					A 5 0.36

MOE - Measure of Effectiveness

LOS - Level of Service

Delay - Average Delay per Vehicle in Seconds

V/C - Volume to Capacity Ratio

Q - 95th Percentile Queue Length (m)

Stor. - Existing Storage (m)

Avail. - Available Storage (m)

TCS - Traffic Control Signal

TWSC - Two-Way Stop Control

AWSC - All-Way Stop Control

< / > - Shared with through movement



TABLE 4.7: 2033 PM BACKGROUND TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
PM Peak Hour	Hwy 50 [Peel Regional Road 50] & Columbia Way	TCS	LOS Delay V/C Q Stor. Avail.	< < < < <	C 32 0.00 0 -	> > > > >	C 32 0.75 62 60 -2	D 47 0.05 0 -	> > > > >	D 43	A 6 0.00 1 136 135	B 10 0.55 120 -	A 6 9 300 291	A 10	B 10 0.39 33 85 52	A 8 0.36 68 -	A 6 0 25 25	A 9	B 15 0.59	
	Kingsview Drive & Columbia Way	TCS	LOS Delay V/C Q		A 4 0.29 27	> > > > >	A 4	< < < < <	A 4		C 31 0.25 16	> > > > >	C 31						A 7 0.29	
	Westchester Road & Columbia Way	TWSC	LOS Delay V/C Q		A 0 0.20 0	> > > > >	A 0	< < < < <	A 2		B 13 0.18 5	> > > > >	B 13						A 2 0.45	
	Mount Hope Road & Columbia Way	TWSC	LOS Delay V/C Q	< < < < <	A 1 0.03 1	> > > > >	A 1	< < < < <	A 1	> > > > >	A 1	< < < < <	B 15 0.10 3	> > > > >	B 15	< < < < <	B 12 0.13 4	> > > > >	B 12	A 3 0.37
	Caledon-King Townline South & Columbia Way	TWSC	LOS Delay V/C	D 29 0.56		> > >	D 29					< < <	A 4 0.16		A 4		A 0 0.22	> > >	A 0	A 6 0.80
	Mount Hope Road & Castlederg Side Road	AWSC	LOS Delay V/C Q	< < < < <	B 14 0.60	> > > > >	B 14	< < < < <	B 12 0.42	> > > > >	B 12	< < < < <	A 10 0.11	> > > > >	A 10	< < < < <	A 10 0.11	> > > > >	A 10	B 13 0.58
	Forest Gate Avenue & Columbia Way	TWSC	LOS Delay V/C Q		A 0 0.12 0	> > > > >	A 0	< < < < <	A 4 0.07 2		A 4	B 12 0.13 4	> > > > >	B 12						A 4 0.35

MOE - Measure of Effectiveness

LOS - Level of Service

Delay - Average Delay per Vehicle in Seconds

V/C - Volume to Capacity Ratio

Q - 95th Percentile Queue Length (m)

Stor. - Existing Storage (m)

Avail. - Available Storage (m)

TCS - Traffic Control Signal

TWSC - Two-Way Stop Control

AWSC - All-Way Stop Control

< / > - Shared with through movement



4.3.4 2033 Total Traffic

Table 4.8 and **Table 4.9**, summarize the level of service conditions for the 2033 total traffic volumes in the AM and PM peak periods respectively. **Appendix I** contains the detailed Synchro reports.

The following additional critical movements are forecast in the 2033 total traffic scenario that were not present in the 2033 background traffic scenario:

- ▶ Caledon-King Townline South & Columbia Way:
 - The eastbound left is forecast to operate with an unacceptable LOS F during PM peak hour with an unacceptable V/C ratio of 1.38.

As forecast in the analysis, the level of service and queue lengths are expected to worsen due to background traffic growth. However, all intersections other than Highway 50 [Peel Regional Road 50] & Columbia Way are not forecast to have any queuing issues.

Two specific intersections are forecast to operate at LOS F during peak hours due to the proposed development volumes: Columbia Way & Westchester Road/Proposed North-South Road and Mount Hope Road & Columbia Way.

The increased delay is a result of the high volume of eastbound/westbound traffic forecast along Columbia Way. Localized congestion along the minor street approaches during the peak hours is generally expected as volumes on the main road leave few gaps for minor street vehicle manoeuvres.

At the intersection of Caledon-King Townline South & Columbia Way, the eastbound left-turn movement is expected to operate with delays in the LOS F range during the PM peak hour and a V/C ratio greater than 1.00. This critical movement is attributed to the increased traffic volumes from the nearby developments significantly for this horizon compared to previous horizons.

Otherwise, all movements at intersections within the study area are operating with acceptable delays, levels of service, and within capacity.



TABLE 4.8: 2033 AM TOTAL VOLUMES TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																	
				Eastbound				Westbound				Northbound				Southbound				Overall	
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		
AM Peak Hour	Hwy 50 [Peel Regional Road 50] & Columbia Way	TCS	LOS Delay V/C Stor. Avail.	< < < <	C 24 0.04 7 -	> > > >	C 24	E 64 0.95 122 60 -62	C 26 0.20 10 -	> > > >	D 49	B 12 0.01 2 136 134	B 16 0.43 66 -	B 13 0.20 7 300 293	B 15	C 28 0.70 69 85 16	C 21 0.64 114 -	A 0 0.00 25 25	C 23	C 28	
	Kingsview Drive & Columbia Way	TCS	LOS Delay V/C Q		A 8 0.56 65	> > > >	A 8	< < < <	C 30 0.93 117		C 30	D 47 0.66 32		> > > >	D 47						C 23
	Westchester Road/Proposed North-South Street A & Columbia Way	TWSC	LOS Delay V/C Q	< < < <	A 1 0.02 0	> > > >	A 1	< < < <	A 2 0.09 2	> > > >	A 2	< < < <	F 269 1.42 125	> > > >	F 269	< < < <	F 392 1.68 131	> > > >	F 392	F 98 0.63	
	Mount Hope Road & Columbia Way	TWSC	LOS Delay V/C Q	< < < <	A 3 0.12 3	> > > >	A 3	< < < <	A 0 0.00 0	> > > >	A 0	< < < <	F 253 1.29 78	> > > >	F 253	< < < <	F 690 2.39 261	> > > >	F 690	F 186 0.69	
	Caledon-King Townline South & Columbia Way	TWSC	LOS Delay V/C Q	F 390 1.79 334		> > > >	F 390					< < < <	A 6 0.19 6		A 6		A 0 0.45 0	> > > >	A 0	F 148 1.00	
	Mount Hope Road & Proposed East-West Street C	TWSC	LOS Delay V/C Q	A 10 0.07 2		> > > >	A 10					< < < <	A 1 0.01 0		A 1		A 0 0.14 0	> > > >	A 0	A 2 0.22	
	Mount Hope Road & Proposed East-West Street B	TWSC	LOS Delay V/C Q	B 10 0.16 5		> > > >	B 10					< < < <	A 4 0.06 1		A 4		A 0 0.14 0	> > > >	A 0	A 4 0.37	
	Mount Hope Road & Castlederg Side Road	AWSC	LOS Delay V/C	< < <	B 13 0.47	> > >	B 13	< < <	B 13 0.46	> > >	B 13	< < <	B 11 0.19	> > >	B 11	< < <	B 12 0.39	> > >	B 12	B 13 0.43	
	Forest Gate Avenue & Columbia Way	TWSC	LOS Delay V/C Q		A 0 0.32 0	> > > >	A 0	< < < <	A 1 0.02 1		A 1	C 19 0.44 17		> > > >	C 19						A 4 0.42
	Mount Hope Road & Mount Hope Road & Proposed East-West Street L North	TWSC	LOS Delay V/C Q	A 10 0.00 0		> > > >	A 10					< < < <	A 0 0.00 0		A 0		A 0 0.16 0	> > > >	A 0	A 0 0.23	
	Mount Hope Road & Mount Hope Road & Proposed East-West Street L South	TWSC	LOS Delay V/C Q	A 10 0.02 0		> > > >	A 10					< < < <	A 1 0.01 0		A 1		A 0 0.14 0	> > > >	A 0	A 1 0.22	

MOE - Measure of Effectiveness

LOS - Level of Service

Delay - Average Delay per Vehicle in Seconds

V/C - Volume to Capacity Ratio

Q - 95th Percentile Queue Length (m)

Stor. - Existing Storage (m)

Avail. - Available Storage (m)

TCS - Traffic Control Signal

TWSC - Two-Way Stop Control

AWSC - All-Way Stop Control

</> - Shared with through movement



TABLE 4.9: 2033 PM TOTAL VOLUMES TRAFFIC OPERATIONS

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																	
				Eastbound				Westbound				Northbound				Southbound				Overall	
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach		
PM Peak Hour	Hwy 50 [Peel Regional Road 50] & Columbia Way	TCS	LOS Delay V/C Stor. Avail.	< 29 < 0 < - < -	C 29 > 0.00 > 0 > -	> > > > > >	C 29	D 50 0.82 78 60 -18	C 30 0.07 0 - -	> > > > > >	D 44	A 7 0.00 1 136 135	B 13 0.57 126 - -	A 8 0.15 10 300 290	B 11	B 17 0.56 55 85 30	A 10 0.38 71 - 25	A 7 0.00 0 25 25	B 12	B 18	
	Kingsview Drive & Columbia Way	TCS	LOS Delay V/C Q	< 4 < 0.34 < 34	A > > >	> > >	A 4	< 4 < 0.29 < 28	A > > >	> > >	A 4	C 31 0.25 16	> > >	> > >	C 31	< < <	D 28 > 0.57 > 27	D 28	A 8 0.57		
	Westchester Road/Proposed North-South Street A & Columbia Way	TWSC	LOS Delay V/C Q	< 3 < 0.09 < 2	A > > >	> > >	A 3	< 1 < 0.04 < 1	A > > >	> > >	A 1	< 26 < 0.36 < 12	> > >	> > >	D 26	< 28 < 0.57 < 27	> > >	> > >	D 28	A 8 0.57	
	Mount Hope Road & Columbia Way	TWSC	LOS Delay V/C Q	< 2 < 0.07 < 2	A > > >	> > >	A 2	< 0 < 0.02 < 0	A > > >	> > >	A 0	< 24 < 0.18 < 5	> > >	> > >	C 24	< 22 < 0.36 < 12	> > >	> > >	C 22	A 4 0.60	
	Caledon-King Townline South & Columbia Way	TWSC	LOS Delay V/C Q	F 250 1.38 121	> > >	> > >	F 250	< < <	A 5 < 0.21 < 6	A > > >	A 5	< 0 < 0.42 < 0	A > > >	A 0	E 39 1.03						
	Mount Hope Road & Proposed East-West Street C	TWSC	LOS Delay V/C Q	B 12 0.23 7	> > >	> > >	B 12	< < <	A 2 < 0.03 < 1	A > > >	A 2	< 0 < 0.07 < 0	A > > >	A 0	A 4 0.33						
	Mount Hope Road & Proposed East-West Street B	TWSC	LOS Delay V/C Q	B 14 0.24 8	> > >	> > >	B 14	< < <	A 4 < 0.09 < 2	A > > >	A 4	< 0 < 0.08 < 0	A > > >	A 0	A 6 0.33						
	Mount Hope Road & Castlederg Side Road	AWSC	LOS Delay V/C	< 26 < 0.77	D > >	> >	D 26	< 17 < 0.55	C > >	> >	C 17	< 17 < 0.53	C > >	C > >	C 17	< 12 < 0.18	B > >	> >	B 12	C 20 0.64	
	Forest Gate Avenue & Columbia Way	TWSC	LOS Delay V/C Q	< 0 0.16 0	A > >	> >	A 0	< 2 < 0.08 < 2	A > >	> >	A 2	C 17 0.21 6	> > >	> > >	C 17	< < <	A 0 0.09 0	A > >	> >	A 0	A 3 0.55
	Mount Hope Road & Mount Hope Road & Proposed East-West Street L North	TWSC	LOS Delay V/C Q	B 12 0.00 0	> > >	> > >	B 12	< < <	A 0 < 0.00 < 0	A > > >	A 0	< 0 < 0.01 < 0	A > > >	A 0	< 0 < 0.08 < 0	A > >	> >	A 0	A 0 0.26		
	Mount Hope Road & Mount Hope Road & Proposed East-West Street L South	TWSC	LOS Delay V/C Q	A 9 0.02 0	> > >	> > >	A 9	< < <	A 0 < 0.01 < 0	A > > >	A 0	< 0 < 0.01 < 0	A > > >	A 0	< 0 < 0.08 < 0	A > >	> >	A 0	A 0 0.31		

MOE - Measure of Effectiveness

LOS - Level of Service

Delay - Average Delay per Vehicle in Seconds

V/C - Volume to Capacity Ratio

Q - 95th Percentile Queue Length (m)

Stor. - Existing Storage (m)

Avail. - Available Storage (m)

TCS - Traffic Control Signal

TWSC - Two-Way Stop Control

AWSC - All-Way Stop Control

< / > - Shared with through movement



4.4 Mitigation Measures

4.4.1 Traffic Signal Warrants

Two intersections are projected to operate at LOS F during peak hours due to the anticipated development traffic volumes: Columbia Way & Westchester Road/Proposed North-South Road and Mount Hope Road & Columbia Way. The intersection of Caledon-King Townline South & Columbia Way is projected to operate at LOS F during peak hours due to the anticipated background traffic volumes.

Ontario Traffic Manual (OTM) Book 12¹¹, includes several justifications for estimating the need for traffic signals at an intersection. The justifications rely on existing or forecast traffic volumes, collision history, or pedestrian volumes in the case of signalized pedestrian crossings.

Justification 7 (Projected Volumes) was used to determine the need for traffic signals at any existing or future intersection using forecast traffic volumes. Justification 7 uses average hourly volumes (AHV) derived from peak hour volumes (PHV) rather than eight-hour volumes, since an estimate of future eight-hour traffic volumes is difficult to predict with necessary accuracy.

The uncertainty of estimating future traffic volumes requires an *existing* intersection with forecast traffic volumes to satisfy both Warrants 1A and 1B, or both Warrants 2A and 2B to 120% of the threshold volumes. **Table 4.10** summarizes the Signal Justification Calculation for Forecast Volumes results.

¹¹ OTM Book 12: Traffic Signals, *Ministry of Transportation of Ontario*, 2012



TABLE 4.10: SIGNAL JUSTIFICATION RESULTS

Intersection	Warrant		Results	Warranted?
Columbia Way and Westchester Road	Warrant 1 - Minimum Vehicular Volume	1A	76.5%	No
		1B	229.1%	
	Warrant 2 - Delay To Cross Traffic	2A	22.4%	No
		2B	241.0%	
Columbia Way and Mount Hope Road	Warrant 1 - Minimum Vehicular Volume	1A	75.6%	No
		1B	244.1%	
	Warrant 2 - Delay To Cross Traffic	2A	18.0%	No
		2B	268.3%	
Caledon-King Townline South and Columbia Way	Warrant 1 - Minimum Vehicular Volume	1A	113.0%	No
		1B	82.8%	
	Warrant 2 - Delay To Cross Traffic	2A	83.6%	No
		2B	56.7%	

The traffic signal warrant analyses indicate that the intersection volumes do not justify signalization under 2033 total traffic condition for the intersections of Columbia Way and Westchester Road, Columbia Way and Mount Hope Road, or Caledon-King Townline South and Columbia Way.

Appendix K contains the traffic signal warrant report.

4.4.2 Highway 50 [Peel Regional Road 50] and Columbia Way

The westbound left-turn queues at the intersection of Highway 50 and Columbia are anticipated to surpass the storage capacity. However, further analysis indicates that optimizing the cycle length and intersection splits can mitigate queues. A cycle length of 60 seconds has demonstrated a significant reduction in queue lengths. Nevertheless, this cycle length may not provide sufficient storage space, as it precisely aligns with the required lengths. However, cycle length adjustments may not fully mitigate queuing issues. As such, it is also recommended to enhance the storage length by 5 m to accommodate any potential excess queues.



Table 4.11 summarizes the level of service conditions for the 2033 total traffic volumes with mitigation in the AM peak hour. **Appendix J** contains the detailed Synchro reports.



TABLE 4.11: 2033 AM TOTAL TRAFFIC OPERATIONS (MITIGATED)

Analysis Period	Intersection	Control Type	MOE	Direction/Movement/Approach																
				Eastbound				Westbound				Northbound				Southbound				Overall
				Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	Left	Through	Right	Approach	
AM Peak Hour	Hwy 50 [Peel Regional Road 50] & Columbia Way	TCS	LOS Delay V/C Q Stor. Avail.	< < < < <	B 16 0.05 5 - -	> > > > >	B 16	C 28 0.81 61 65 4	B 16 0.20 10 - -	> > > > >	C 24	A 8 0.01 1 136 135	B 11 0.47 43 - -	A 9 0.20 7 300 293	B 10.3	C 20 0.70 48 85 37	B 15 0.69 75 - -	A 0 0.00 0 25 25	B 17	B 18

MOE - Measure of Effectiveness

LOS - Level of Service

Delay - Average Delay per Vehicle in Seconds

V/C - Volume to Capacity Ratio

Q - 95th Percentile Queue Length (m)

Stor. - Existing Storage (m)

Avail. - Available Storage (m)

TCS - Traffic Control Signal

< / > - Shared with through movement



5 Conclusions and Recommendations

5.1 Conclusions

Based on the investigations carried out, it is concluded that:

- ▶ **Existing Operations:** all study area intersections operate at acceptable levels of service and within capacity during the AM, and PM peak hour analysis time periods.
- ▶ **Site Generated Traffic:** The subject site is estimated to generate approximately 434 new AM peak hour trips and approximately 539 new PM peak hour trips.
- ▶ **2028 Background Traffic Operations:** Critical movements not observed in existing traffic conditions include:
 - Highway 50 [Peel Regional Road 50] & Columbia Way: The westbound left-turn queue length is forecast to exceed available storage by 29m during the AM peak hour.
- ▶ **2028 Total Traffic Operations:** the forecasting showed the following Critical movements that were not present under existing conditions:
 - Highway 50 [Peel Regional Road 50] & Columbia Way:
 - The westbound queue length is forecast to exceed available storage by 18m during the PM peak hour.
 - Columbia Way & Westchester Road/Proposed North-South Road:
 - The northbound approach, northbound through movement, southbound approach and southbound through movement are forecast to operate with an Operate with delays in the LOS F range during the AM peak hour with a v/c ratio greater than 1.00.
 - The northbound through and southbound through movements are forecast with an unacceptable Volume to Capacity (V/C) ratio during the AM peak hour.
- ▶ Mount Hope Road & Columbia Way:
 - The northbound approach, northbound through movement, southbound approach and southbound through movement are forecast to operate with an unacceptable LOS F during the AM peak hour.
 - The southbound through is also forecast to operate with an unacceptable V/C ratio during the AM peak hour



- The overall intersection is forecast to operate with an unacceptable LOS F during the AM peak hour.
- ▶ Caledon-King Townline South & Columbia Way:
 - The overall intersection is forecast to operate with an unacceptable LOS F during the AM peak hour;
 - The eastbound left is forecast to operate with an unacceptable LOS F during both peak hours with an unacceptable V/C ratio;
 - The eastbound approach is forecast to operate with an unacceptable LOS F during both peak hours.
- ▶ **2033 Background Traffic Operations:** the forecasting showed the following critical movements that were not present under the 2028 background operations include:
 - Highway 50 [Peel Regional Road 50] & Columbia Way:
 - The westbound queue length is forecast to exceed available storage by 2m during the PM peak hour.
 - Caledon-King Townline South & Columbia Way:
 - The eastbound left-turn is forecast to operate with an unacceptable LOS F during the AM peak hour.
 - The eastbound approach is forecast to operate with an unacceptable LOS F during the AM peak hour.
- ▶ **2033 Total Traffic Operations:** the forecasting showed the following critical movements that were not present under the 2028 background operations include:
 - Caledon-King Townline South & Columbia Way:
 - The eastbound left-turn is forecast to operate with an unacceptable LOS F during the PM peak hour with an unacceptable V/C ratio of 1.38.
- ▶ The following **mitigation measures** were considered:
 - The traffic signal warrant analyses indicate that the intersection volumes do not justify signalization under 2033 total traffic condition for the intersections of Columbia Way and Westchester Road, Columbia Way and Mount Hope Road, and Caledon-King Townline South and Columbia Way.
 - At the intersection of Highway 50 and Columbia Way, the westbound left-turn lane is expected to exceed its capacity



which is triggered by this development and other proposed developments.

5.2 Recommendations

To address the westbound left-turn lane capacity issues at the intersection of Highway 50 and Columbia Way, signal timing adjustments and increasing the westbound left-turn lane storage length is recommended. The cycle length should be adjusted to a 60-second cycle which results in a significant reduction in queue lengths. However, to ensure sufficient capacity, it is also recommended to increase the storage length by 5 m to accommodate any potential excess queues.



Appendix A

Pre-Study Consultation Material and Responses



2023-03-11
Project number: 230561

Kavleen S. Younan, P.Eng.
Transportation Engineer
Town of Caledon
6311 Old Church Road,
Caledon, ON
L7C 1J6

Dear Kavleen:

**RE: *REVISED TERMS OF REFERENCE FOR TRANSPORTATION STUDY –
RESIDENTIAL DEVELOPMENT, MOUNT HOPE, CALEDON, ONTARIO***

Paradigm Transportation Solutions Limited is pleased to provide our terms of reference for a transportation study in support of the above development. The following outlines our understanding of the assignment and details our work plan. A site plan is attached.

Project Understanding

The subject site is located in the northwest quadrant of Columbia Way and Mount Hope Road. The property owner is proposing to create a residential subdivision with approximately 670 dwelling units. These will be a mix of detached homes, townhouses, and block townhouses. Vehicle access is proposed via a new access road on Columbia Way and two new access roads onto Mount Hope, plus direct access onto Mount Hope Road.

We will be conducting the following investigations:

- ▶ **A Transportation Impact Assessment (TIA)** to evaluate the effects of the proposed development on the transportation system and recommend improvements, if necessary, to address potential impacts. With the information we have to date, we believe that a reasonable study area would include the following ten intersections:
 - Hwy 50 [Peel Regional Road 50] and Columbia Way (signalized)
 - Kingsview Drive and Columbia Way (signalized)
 - Westchester Road Columbia Way (unsignalized)
 - Mount Hope Road and Columbia Way (unsignalized)

- Caledon-King Townline South and Columbia Way (unsignalized);
- Mount Hope Road and Castlederg Side Road (unsignalized);
- Columbia Way and Proposed North-South Road (unsignalized);
- Columbia Way and Forest Gate Avenue (unsignalized);
- Mount Hope Road and Proposed East-West Road A (unsignalized);
- Mount Hope Road and Proposed East-West Road B (unsignalized);
- Proposed North-South Road and Proposed East-West Road A (unsignalized);
- Proposed North-South Road and Proposed East-West Road B (unsignalized);

Error! Reference source not found. illustrates the location of internal roads in the proposed development.

Traffic forecasts and analysis will be completed for two planning horizons (five and ten years from the date the study is commissioned) and two analysis periods (weekday AM and PM peak hours).

- ▶ An **Access and Circulation Review (ACR)** to ensure compliance of the proposed development plan with review agencies requirements and applicable industry guidelines. This will include a **Pedestrian and Cyclist Circulation Plan** in line with the Town of Caledon's requirements.
- ▶ A **Transportation Demand Management (TDM) Plan** outlining existing and proposed TDM measures, assessing their likely effectiveness for the proposed development and determining implementation requirements to facilitate their use.

The study will follow the Town of Caledon's *Traffic Impact Study: Terms of Reference and Guidelines* (March 2017).

Work Plan

The following outlines our proposed work plan to carry out this assignment:

Task 1 – Pre-Study Consultation and Data Assembly

We will contact the Town of Caledon and Peel Region (the review agencies) to request their feedback on the scope of work, study area and other assumptions.

We will gather available data, relevant background reports and any other information about the study area pertinent to the assessment (e.g. other approved developments in the vicinity, zoning by-law provisions). Any apparent data gaps or discrepancies will be addressed with the review agencies.

We will visit the site to observe traffic and parking conditions on roads in the study area. Roadway configuration and traffic control will be documented, with a figure illustrating the



study area prepared. Other related features such as pedestrian and cycling facilities and transit stops will be noted.

Task 2 – Forecasting and Analysis

Transportation Impact Assessment

We will prepare vehicle traffic forecasts for each planning horizon and analysis period. The components of the forecasts are as follows:

- ▶ **Existing** 2023 volumes will be derived from the traffic data assembled in Task 1.
- ▶ **Future Background** volumes for the remaining horizon years will be estimated by applying a growth rate to the existing volumes and adding anticipated trips from nearby approved and in-stream developments(Bolton North Hill Landowners Group, 14245 Hwy 50 Caledon, and 13540 Caledon/king Town Line). Growth rates and developments to include in the background traffic forecasts will be confirmed with review agencies during Task 1 (2% growth rate per annum) .
- ▶ The **total trips generated** by the proposed development will be forecast based on the rates contained in the Institute of Transportation Engineers (ITE) *Trip Generation Manual (11th Edition)* or as directed by the review agencies.
- ▶ The **site-generated vehicle trips** will be distributed and assigned to the study area intersections based on existing traffic patterns and *Transportation Tomorrow Survey* data.
- ▶ The resulting site traffic assignments will be added to the Future Background estimates to produce **Future Total** volumes for each future horizon year and analysis period.
- ▶ Under background conditions, the planned cycling, walking, and transit improvements by the Region of Peel and the Town of Caledon will be addressed in the TIS;
- ▶ The TIS will include all planned infrastructure proposed by the planner that will be implemented for all modes of transportation in the proposed development; missing links will be addressed to ensure that the proposed development is accessible for all modes of transportation;
- ▶ The two internal roads serving the proposed development will be analyzed to ensure they are within capacity. The location of the roads has been shown on the attached map along with all the study are intersections;

We will analyze the operation of the study area intersections for the Existing, Future Background (without the development) and Future Total (with the development) traffic conditions for each analysis period using Synchro software. Volume-to-capacity (v/c) ratios, Level of Service (LOS) and queuing will be assessed.



Based on the analysis results, we will identify any operational deficiencies as well as the net impact of the proposed development on the study area road network. The need for road improvements (e.g. auxiliary turn lanes) and/or other mitigating measures (e.g. traffic control device modifications) to address deficiencies will be determined. We will assess whether these measures are required due to non-site traffic (i.e. Existing or Future Background) or the increase in volumes resulting from the proposed development (i.e. Future Total).

We will assess the potential impact and requirements of the site for non-auto modes of transportation. This would include identifying existing and planned transit, walking, and cycling routes and facilities that would enhance connectivity both within the subdivision and with the rest of the municipality for these modes.

Access and Circulation Review

We will review the site access and circulation design to ensure compliance with review agencies requirements and applicable industry guidelines. The analysis will be completed using AutoTURN and include assessments of vehicle access and egress, clearance and swept path manoeuvres within the site based on a suitable design vehicle (e.g. fire truck, garbage truck) to identify potential conflicts with the site driveways, circulation aisles, loading areas and/or parking layout (i.e. no “dead end” spaces). Recommended design changes resulting from the assessment will be provided to the client (or its agents) for consideration.

A **Pedestrian and Cyclist Circulation Plan** will be conducted which will also show the boundary connections. Clearances will be confirmed as specified in TAC are met for collector roadways. The intersection spacing and sight distance will be reviewed for all new roads along Town Roads.

Transportation Demand Management (TDM)

We will prepare a TDM Plan for the proposed development. The plan will capture:

- ▶ Existing TDM opportunities near the development site (such as proximity to existing or planned transit or active transportation networks); and
- ▶ Proposed TDM measures to be implemented on the site. This list of measures to encourage greater use of more sustainable modes of transportation (transit, walking, cycling) and trip decision making that reduces, combines, or shortens vehicle trips will be developed in consultation with the client (and/or its agents).

The plan will summarize existing and proposed measures, assess their likely effectiveness for the proposed development and determine implementation requirements to facilitate their use (e.g. bike racks, showers).

Task 3 – Report Preparation

We will document the study methodologies, findings and conclusions in a report for review by the client, prior to their submission to the City. The final report will include detailed analysis



results and any data collected. The report will be stamped by a suitably-qualified Professional Engineer in line with the requirements of Professional Engineers Ontario.

Conclusion

Please contact Tom Willis, the Project Manager for this assignment, at (416) 479 9684 x503 or by e-mail at twillis@ptsl.com if you have any questions related to this project.

Yours truly,

PARADIGM TRANSPORTATION SOLUTIONS LIMITED

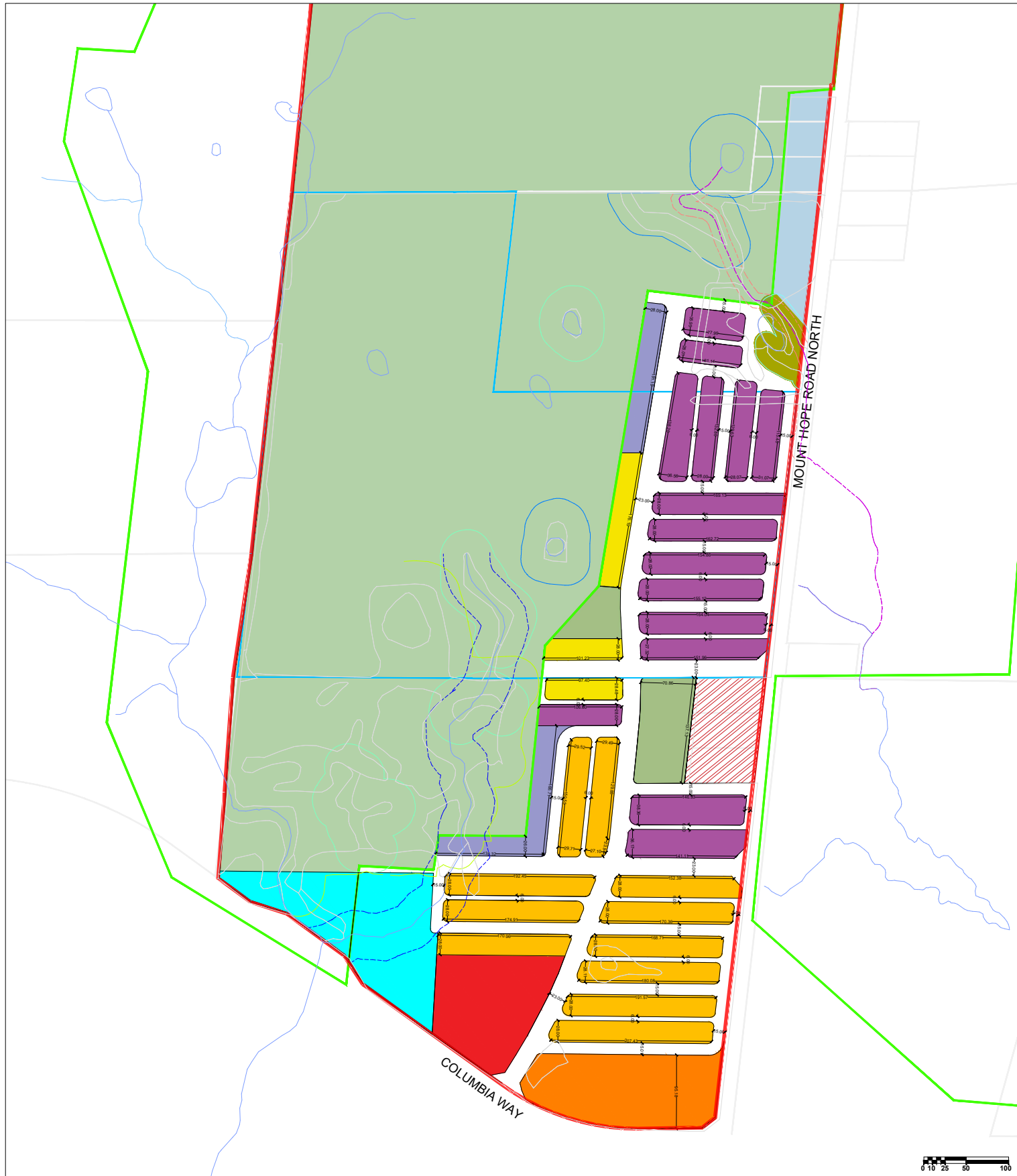


Tom Willis

MMath

Senior Project Manager





DEVELOPMENT CONCEPT PLAN

Takeoff Analysis

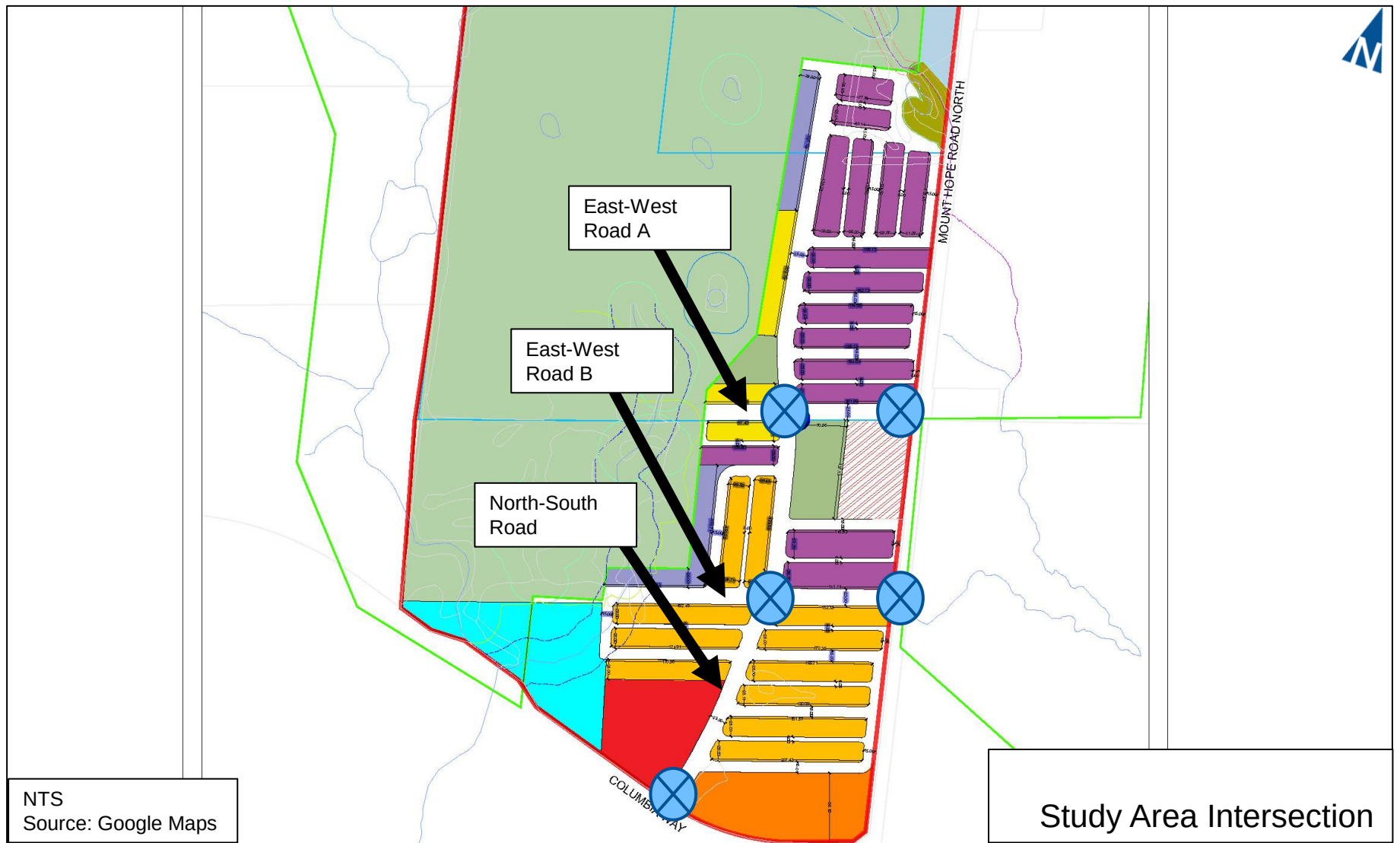
Subject Site
Gross Developable Area: 33.68ha
Net Developable Area: 31.69ha
-Savanta to Confirm-
Environmental Feature Take Out: 1.99ha
-Savanta to Confirm-
Boundary of Greenbelt Plan Area*
Flood Plain Area*
30m Offset -Savanta to Confirm-
Frontage Measurement

- Non-Participating Landowners
- 13.7m Laneway Semi-Detached - 134 Units
- 15.2m Street Semi-Detached - 30 Units
- 6m Street Towns - 264 Units
- 11m Singles - 32 Units
- Townhouse/Mid/Highrise Blk - 60UPH-250UPH
2.18ha * 60 = 131 Units
2.18ha * 250 = 545 Units
- Park (1.31ha)
- Commercial Block (1.87ha)
- Wetland +15m Buffer

Note:
Parkland: 5% of 31.69ha = 1.58ha
Stormwater Pond: 8% of 31.69ha = 2.54ha
ROW's: Collector - 23m (matches Westchester Blvd.)
Local - 18m
Front YD Setback = 6m
Rear YD Setback = 7.5m
Exterior YD Setback = 1.5m
* As per GIS data provided by
Town of Caledon - Jun 2020

Date: November 22, 2023





From: [Kavleen Younan](#)
To: [Mauro Peverini](#)
Cc: [Emma Howlett](#); [Tom Willis](#)
Subject: RE: Nount Hope West - Transportation Study Terms of Reference
Date: April 17, 2024 11:27:55
Attachments: [image002.png](#)
[image003.png](#)

Hi Mauro,

Please find our comments below.

- The updated TOR should be circulated to the Region. Consult with the Region regarding proposed growth rates on regional roadways.
- The Existing horizon year in the TOR is 2023, while the date of the TOR is 2024. Please revise.
- The Secondary Plan Level 'Pedestrian and Cyclist Circulation Plan' should follow the comments in the TOR response dated January 19th, 2024.
- The submission should demonstrate:
 - the alignment of the proposed north-south road and Westchester Boulevard.
 - that the proposed public roadway complies with the infrastructure requirements of the Town's standard ROW, including, but not limited to, off-road cycling facility provisions on collector and arterial roadways.
- Additional items that should be included:
 - A figure illustrating the proposed collector road network rights-of-way.
 - A high-level potential Transit Plan for the Secondary Plan Area. This should include transit planning, such as routes, bus stops, and connections to the existing and future Brampton Transit services
 - Discussion of the design parameters that were considered in the collector road layout, and how traffic calming will be achieved through design.
- Mention of the commercial development has been removed from paragraph 2. This should be included in the assessment.
- All new intersections are noted as unsignalized. Signalization warrants, delays, and pedestrian lines of desire should be reviewed, and recommendations should be made.
- Please note: a 'Mobility Plan' is required to support the Secondary Plan application, as per the DRAFT Official plan.
- Region of Peel Transportation Study Guidelines should be followed.

Kavleen S. Younan, P.Eng.

Transportation Engineer

Engineering, Public Works & Transportation Department

Upcoming Vacation Alert: I will be away from May 13th 2024 until May 27th 2024

Email: kavleen.younan@caledon.ca

Town of Caledon | www.caledon.ca | www.visitcaledon.ca | Follow us @TownofCaledon

STRATEGIC PLAN 2023-2035



The best of rural and urban life for everyone

From: Mauro Peverini <mauro@solmar.ca>

Sent: Wednesday, April 10, 2024 9:54 AM

To: Kavleen Younan <Kavleen.Younan@caledon.ca>

Cc: Emma Howlett <Emma.Howlett@caledon.ca>; Tom Willis <twillis@ptsl.com>

Subject: Nount Hope West - Transportation Study Terms of Reference

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the contents to be safe.

Good morning Kavleen, Emma,

Tom Willis of Paradigm Transportation Solutions on March 18, 2024, forwarded for Town review and comment the attached Terms of Reference (TOR) regarding a Transportation Study for lands at the northwest quadrant of Columbia Way & Mount Hope Road in the Town of Caledon. To date, no comments or response has been received. United Holdings wishes to advance the review process and respectfully requests that the attached TOR be reviewed, and comments provided to allow the required analysis to be undertaken to meet Town requirements. Please advise when comments are expected from the Town.

If you have any questions,

Thank you,

Mauro Peverini, MCIP, RPP

Vice President, Planning and Land Development

T. 905.660.9222 Ext. 293

M. 437.247.2310

www.solmar.ca

122 Romina Drive,
Concord, Ontario L4K 4Z7



Creating Communities for a Brighter Tomorrow



Save a tree, please do not print this e-mail unless necessary

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2024-05-07
Project number: 230561

Patrick Amaral MES(PI), MCIP, RPP
Principal Planner
Planning and Development Services
Region of Peel
10 Peel Centre Drive
Brampton, ON
L6T 4B9

Dear Patrick:

**RE: TERMS OF REFERENCE FOR TRANSPORTATION STUDY –
RESIDENTIAL DEVELOPMENT, MOUNT HOPE, CALEDON, ONTARIO**

Paradigm Transportation Solutions Limited is pleased to provide our terms of reference for a transportation study in support of the above development. The following outlines our understanding of the assignment and details our work plan. A concept plan is attached; this is subject to refinement.

Project Understanding

The subject site is located in the northwest quadrant of Columbia Way and Mount Hope Road. The property owner is proposing to create a residential subdivision with approximately 670 dwelling units. These will be a mix of detached homes, townhouses, and block townhouses, plus a small commercial site. Vehicle access is proposed via a new north-south access road on Columbia Way and two new access roads (“Road A” and “Road B”) onto Mount Hope Road North.

We will be conducting the following investigations:

- ▶ **A Transportation Impact Assessment (TIA)** to evaluate the effects of the proposed development on the transportation system and recommend improvements, if necessary, to address potential impacts. With the information we have to date, we believe that a reasonable study area would include the following ten intersections:
 - Hwy 50 [Peel Regional Road 50] and Columbia Way (signalized)
 - Kingsview Drive and Columbia Way (signalized)

- Westchester Road Columbia Way (unsignalized)
- Mount Hope Road and Columbia Way (unsignalized)
- Caledon-King Townline South and Columbia Way (unsignalized);
- Mount Hope Road and Castlederg Side Road (unsignalized);
- Columbia Way and Proposed North-South Road (unsignalized);
- Columbia Way and Forest Gate Avenue (unsignalized);
- Mount Hope Road and Proposed East-West Road A (unsignalized);
- Mount Hope Road and Proposed East-West Road B (unsignalized);
- Proposed North-South Road and Proposed East-West Road A (unsignalized);
- Proposed North-South Road and Proposed East-West Road B (unsignalized);

Traffic forecasts and analysis will be completed for two planning horizons (five and ten years from the date the study is commissioned) and two analysis periods (weekday AM and PM peak hours).

- ▶ An **Access and Circulation Review (ACR)** to ensure compliance of the proposed development plan with review agencies requirements and applicable industry guidelines. This will include a **Pedestrian and Cyclist Circulation Plan** and **high-level potential Transit Plan** in line with the Town of Caledon's requirements.
- ▶ A **Transportation Demand Management (TDM) Plan** outlining existing and proposed TDM measures, assessing their likely effectiveness for the proposed development and determining implementation requirements to facilitate their use.

The study will follow the Town of Caledon's *Traffic Impact Study: Terms of Reference and Guidelines* (March 2017) and Peel Region's *Traffic Impact Study - Terms of Reference* (2008). The report will form the **Mobility Plan** required by the Town.



Work Plan

The following outlines our proposed work plan to carry out this assignment:

Task 1 – Pre-Study Consultation and Data Assembly

We will contact the Town of Caledon and Peel Region (the review agencies) to request their feedback on the scope of work, study area and other assumptions.

We will gather available data, relevant background reports and any other information about the study area pertinent to the assessment (e.g. other approved developments in the vicinity, zoning by-law provisions). Any apparent data gaps or discrepancies will be addressed with the review agencies.

We will visit the site to observe traffic and parking conditions on roads in the study area. Roadway configuration and traffic control will be documented, with a figure illustrating the study area prepared. Other related features such as pedestrian and cycling facilities and transit stops will be noted.

Task 2 – Forecasting and Analysis

Transportation Impact Assessment

We will prepare vehicle traffic forecasts for each planning horizon and analysis period. The components of the forecasts are as follows:

- ▶ **Existing** 2024 volumes will be derived from the traffic data assembled in Task 1.
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- ▶ The **total trips generated** by the proposed development will be forecast based on the rates contained in the Institute of Transportation Engineers (ITE) *Trip Generation Manual (11th Edition)* or as directed by the review agencies.
- ▶ The **site-generated vehicle trips** will be distributed and assigned to the study area intersections based on existing traffic patterns and *Transportation Tomorrow Survey* data.
- ▶ The resulting site traffic assignments will be added to the Future Background estimates to produce **Future Total** volumes for each future horizon year and analysis period.
- ▶ Under background conditions, the planned cycling, walking, and transit improvements by the Region of Peel and the Town of Caledon will be addressed in the TIS;



- ▶ The TIS will include all planned infrastructure proposed by the planner that will be implemented for all modes of transportation in the proposed development; missing links will be addressed to ensure that the proposed development is accessible for all modes of transportation;
- ▶ The two internal roads serving the proposed development will be analyzed to ensure they are within capacity. The location of the roads has been shown on the attached map along with all the study area intersections;

We will analyze the operation of the study area intersections for the Existing, Future Background (without the development) and Future Total (with the development) traffic conditions for each analysis period using Synchro software. Volume-to-capacity (v/c) ratios, Level of Service (LOS) and queuing will be assessed.

Based on the analysis results, we will identify any operational deficiencies as well as the net impact of the proposed development on the study area road network. The need for road improvements (e.g. auxiliary turn lanes) and/or other mitigating measures (e.g. traffic control device modifications) to address deficiencies will be determined. We will assess whether these measures are required due to non-site traffic (i.e. Existing or Future Background) or the increase in volumes resulting from the proposed development (i.e. Future Total).

We will recommend the appropriate traffic control for new intersections, through consideration of signalization warrants and pedestrian lines of desire.

We will assess the potential impact and requirements of the site for non-auto modes of transportation. This would include identifying existing and planned transit, walking, and cycling routes and facilities that would enhance connectivity both within the subdivision and with the rest of the municipality for these modes.

Access and Circulation Review

We will review the site access and circulation design to ensure compliance with review agencies requirements and applicable industry guidelines. The analysis will be completed using AutoTURN and include assessments of vehicle access and egress, clearance and swept path manoeuvres within the site based on a suitable design vehicle (e.g. fire truck, garbage truck) to identify potential conflicts with the site driveways, circulation aisles, loading areas and/or parking layout (i.e. no “dead end” spaces). Recommended design changes resulting from the assessment will be provided to the client (or its agents) for consideration.

We will confirm that the proposed public roadway complies with the infrastructure requirements of the Town’s standard ROW, including, but not limited to, off-road cycling facility provisions on collector and arterial roadways. We will provide a figure illustrating the proposed collector road network rights-of-way, a discussion of the design parameters that were considered in the collector road layout, and how traffic calming will be achieved through design.



We will create a **high-level potential Transit Plan** for the study. This will information on potential routes, bus stops, and connections to the existing and future Brampton Transit services

A **Pedestrian and Cyclist Circulation Plan** will be conducted which will also show the boundary connections. Clearances will be confirmed as specified in TAC are met for collector roadways. The intersection spacing and sight distance will be reviewed for all new roads along Town Roads.

Transportation Demand Management (TDM)

We will prepare a TDM Plan for the proposed development. The plan will capture:

- ▶ Existing TDM opportunities near the development site (such as proximity to existing or planned transit or active transportation networks); and
- ▶ Proposed TDM measures to be implemented on the site. This list of measures to encourage greater use of more sustainable modes of transportation (transit, walking, cycling) and trip decision making that reduces, combines, or shortens vehicle trips will be developed in consultation with the client (and/or its agents).

The plan will summarize existing and proposed measures, assess their likely effectiveness for the proposed development and determine implementation requirements to facilitate their use (e.g. bike racks, showers).

Task 3 – Report Preparation

We will document the study methodologies, findings and conclusions in a report for review by the client, prior to their submission to the City. The final report will include detailed analysis results and any data collected. The report will be stamped by a suitably-qualified Professional Engineer in line with the requirements of Professional Engineers Ontario.

Conclusion

Please contact Tom Willis, the Project Manager for this assignment, at (416) 479 9684 x503 or by e-mail at twillis@pts1.com if you have any questions related to this project.

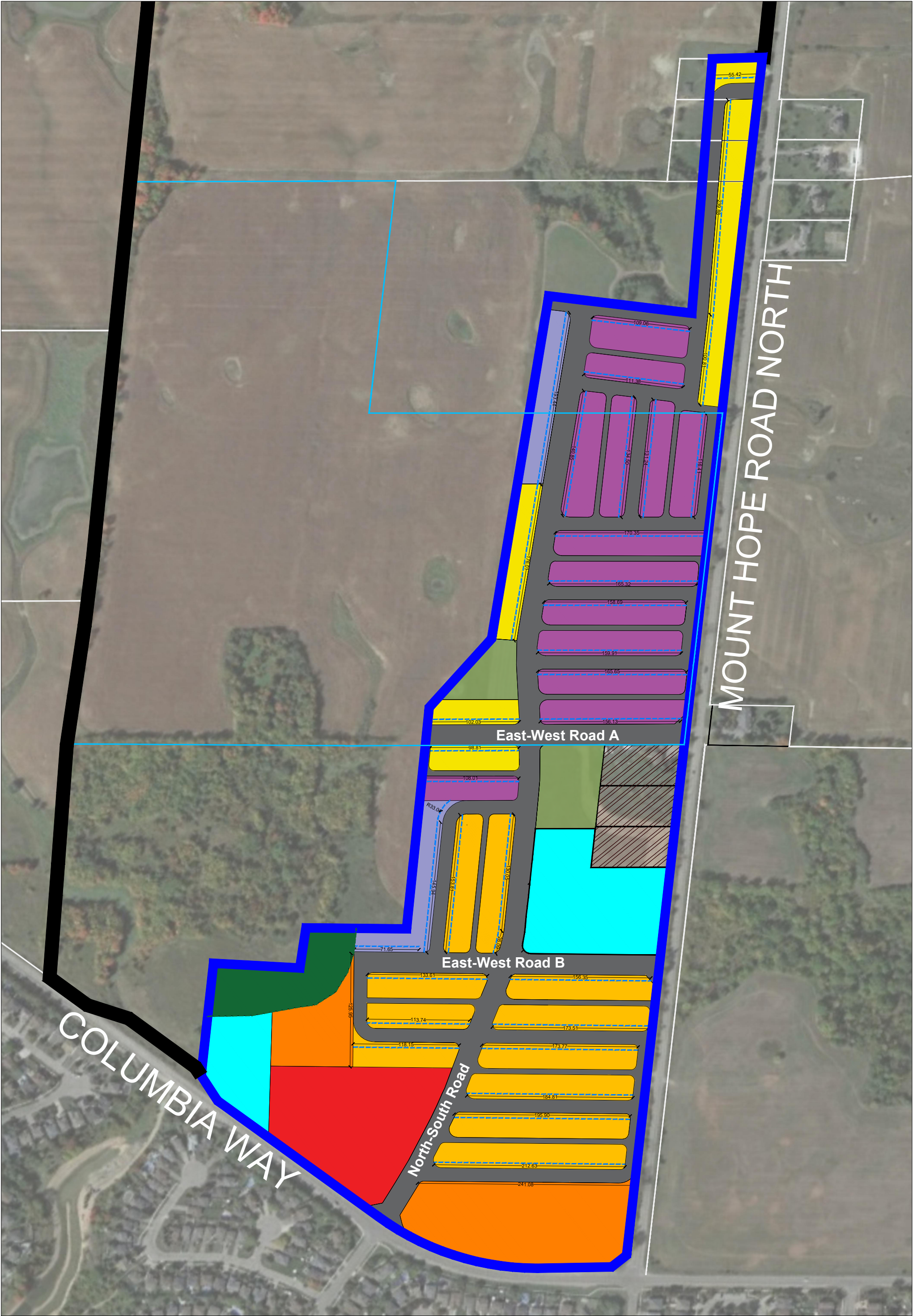
Yours truly,

PARADIGM TRANSPORTATION SOLUTIONS LIMITED



Tom Willis
MMath
Senior Project Manager





CONCEPT PLAN
GOLF COURSE &
GREATER CONTEXT

- Boundary of Urban Area
- Frontage Measurement-5,012m
- Developable Limit

- Non-Participating Landowners
- 13.7m Laneway Semi-Detached-142 Units
- 15.2m Street Semi-Detached-30 Units
- 6m Street Towns-234 Units
- 11m Singles-66 Units
- Townhouse/Mid/Highrise Blk 60UPH-250UPH
0.69ha * 60 = 40 Units
2.18ha * 60-250 = 131-545 Units

- Commercial Block-2.19ha
- Park
- SWM
- Channel Realignment



From: [Amaral, Patrick](#)
To: [Tom Willis](#)
Cc: [Abanoub Gaber](#); [Tanjot Bal](#); [Kavleen Younan](#); [Pelopidas, Chrissy](#); [Hamdani, Hashim](#)
Subject: Region Review- Mount Hope West traffic study - TOR
Date: May 15, 2024 12:04:40
Attachments: [image002.png](#)
[image003.png](#)
[image004.png](#)
[image005.png](#)
[image006.png](#)
[image007.png](#)
[\(230561\) 9408 Columbia - terms of reference for Region 2024-05-07.pdf](#)

Hi Tom,

After our review of the TOR, we offer the following comments below and the [link](#) here for the detailed Region of Peel TIS formatting:

- Please see the following contacts to obtain data for your analysis:
 - Please contact transportationplanningdata@peelregion.ca to confirm growth rates along the subject Regional road(s).
 - Please contact Damian Jamroz (damian.jamroz@peelregion.ca) Supervisor of Traffic Operations to obtain the most recent TMCs and/or average annual daily traffic (AADT).
 - Please contact Rebecca Caughey (Rebecca.caughey@peelregion.ca) Supervisor of Traffic Signals and Streetlighting, to obtain traffic signal timing parameters and ensure that the information includes the appropriate walk/don't walk splits, recall modes and offsets.

We have no further comments regarding the TOR as it contains the appropriate information for the future study.

That being said, we continue to encourage the lands on the north east side of Mount Hope to be considered with this proposed secondary plan area.

Should you have any questions or concerns, please let us know.

Thank you,

Patrick Amaral MES(PI), MCIP, RPP

Principal Planner

Planning and Development Services | Region of Peel

Tel: 905-791-7800 ext. 4093

E-mail: patrick.amaral@peelregion.ca



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From: Tom Willis <twillis@ptsl.com>
Sent: Tuesday, May 7, 2024 9:52 AM
To: Amaral, Patrick <patrick.amaral@peelregion.ca>
Cc: Abanoub Gaber <agaber@ptsl.com>
Subject: RE: (230561) Mount Hope West traffic study - contact

CAUTION: EXTERNAL MAIL. DO NOT CLICK ON LINKS OR OPEN ATTACHMENTS YOU DO NOT TRUST.

Hi Patrick,

We've been working with Kavleen Younan in the Town's Engineering/Public Works/Transportation department. The Town has already reviewed and approved the Terms of Reference (with some minor comments). One requirement was that we seek the Region's approval for the terms of reference, and Kavleen recommended reaching out to the assigned planner (you) for this file.

Given you're the one-window for this development, it sounds like the way forward is for me to provide you with the transportation study Terms of Reference for you to circulate to the relevant people. These are attached – if there any comments or concerns, I am always available for a quick phone call.

Regards,

Tom Willis, MMath
Senior Project Manager
(He/Him)



5A-150 Pinebush Road, Cambridge ON, N1R 8J8
p: 416.479.9684 x503
w: www.ptsl.com

Paradigm operates on a four-day workweek. Our offices are closed on Fridays.
I will be on vacation 27-31 May

From: Amaral, Patrick <patrick.amaral@peelregion.ca>
Sent: Monday, May 6, 2024 5:14 PM
To: Tom Willis <twillis@ptsl.com>

Cc: Abanoub Gaber <agaber@ptsl.com>

Subject: RE: (230561) Mount Hope West traffic study - contact

Hi Tom,

Thanks for your email.

Typically these request will be sent to us directly from the Town. Can you advise who at the Town that you have been coordinating this with?

To answer your question, yes, I'll act as the one-window for our internal teams here at the Region who will review and offer any comments for the Traffic study ToR. That being said, we will need to ensure we are coordinated with the Town i.e. reviewing the same document etc.

Thanks,

Patrick Amaral MES(PI), MCIP, RPP

Principal Planner

Planning and Development Services | Region of Peel

Tel: 905-791-7800 ext. 4093

E-mail: patrick.amaral@peelregion.ca



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From: Tom Willis <twillis@ptsl.com>

Sent: Monday, May 6, 2024 10:42 AM

To: Amaral, Patrick <patrick.amaral@peelregion.ca>

Cc: Abanoub Gaber <agaber@ptsl.com>

Subject: (230561) Mount Hope West traffic study - contact

CAUTION: EXTERNAL MAIL. DO NOT CLICK ON LINKS OR OPEN ATTACHMENTS YOU DO NOT TRUST.

Hi Patrick,

My client developing a subdivision in Caledon in the northeast quadrant of Columbia Way and

Mount Hope Roads, an area known as the “Mount Hope West”. I understand that you have already provided pre-application comments on behalf of the Region.

The Town has requested the Region’s transportation department review our planned terms of reference for the traffic study. Who would be the suitable person to contact?

Regards,

Tom Willis, MMath
Senior Project Manager
(He/Him)



5A-150 Pinebush Road, Cambridge ON, N1R 8J8
p: 416.479.9684 x503
w: www.ptsl.com

Paradigm operates on a four-day workweek. Our offices are closed on Fridays.
I will be on vacation 27-31 May

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Appendix B

Traffic Count Data





Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

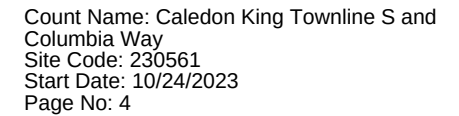
Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@pts1.com

Count Name: Caledon King Townline S and
Columbia Way
Site Code: 230561
Start Date: 10/24/2023
Page No: 1

Turning Movement Data

Start Time	Caledon King Townline S Southbound					Columbia Way Northbound					Caledon King Townline S Eastbound					Int. Total
	Right	Thru	U-Turn	Peds	App. Total	Thru	Left	U-Turn	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	
6:00 AM	2	78	0	0	80	19	1	0	0	20	25	2	0	0	27	127
6:15 AM	0	88	0	0	88	23	1	0	0	24	35	1	0	0	36	148
6:30 AM	1	114	0	0	115	33	4	0	0	37	41	6	0	0	47	199
6:45 AM	0	108	0	0	108	40	4	0	0	44	48	3	0	0	51	203
Hourly Total	3	388	0	0	391	115	10	0	0	125	149	12	0	0	161	677
7:00 AM	2	134	0	0	136	27	11	0	0	38	52	4	0	0	56	230
7:15 AM	3	108	0	0	111	25	6	0	0	31	44	4	0	0	48	190
7:30 AM	6	164	0	0	170	37	14	0	0	51	49	2	0	0	51	272
7:45 AM	5	117	0	0	122	23	22	0	0	45	58	9	0	0	67	234
Hourly Total	16	523	0	0	539	112	53	0	0	165	203	19	0	0	222	926
8:00 AM	20	126	0	0	146	21	37	0	0	58	47	8	0	0	55	259
8:15 AM	9	123	0	0	132	31	10	0	0	41	57	6	0	0	63	236
8:30 AM	5	100	0	0	105	37	10	0	0	47	39	9	0	0	48	200
8:45 AM	7	79	0	0	86	30	9	0	0	39	32	4	0	0	36	161
Hourly Total	41	428	0	0	469	119	66	0	0	185	175	27	0	0	202	856
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	6	66	0	0	72	112	40	0	0	152	22	9	0	0	31	255
4:15 PM	10	53	0	0	63	113	36	0	0	149	19	2	0	0	21	233
4:30 PM	6	68	0	0	74	120	26	0	0	146	31	8	0	0	39	259
4:45 PM	8	75	0	0	83	107	42	0	0	149	26	6	0	0	32	264
Hourly Total	30	262	0	0	292	452	144	0	0	596	98	25	0	0	123	1011
5:00 PM	12	36	0	0	48	106	37	0	0	143	26	5	0	0	31	222
5:15 PM	4	48	0	0	52	103	48	0	0	151	28	5	0	0	33	236
5:30 PM	15	54	0	0	69	108	54	0	0	162	27	5	0	0	32	263
5:45 PM	10	45	0	0	55	102	43	0	0	145	33	8	0	0	41	241
Hourly Total	41	183	0	0	224	419	182	0	0	601	114	23	0	0	137	962
6:00 PM	6	39	0	0	45	105	44	0	0	149	22	7	0	0	29	223
6:15 PM	12	38	0	0	50	82	31	0	0	113	23	10	0	0	33	196
6:30 PM	1	39	0	0	40	50	31	0	0	81	18	5	0	0	23	144
6:45 PM	4	41	0	0	45	83	31	0	0	114	21	3	0	0	24	183
Hourly Total	23	157	0	0	180	320	137	0	0	457	84	25	0	0	109	746
Grand Total	154	1941	0	0	2095	1537	592	0	0	2129	823	131	0	0	954	5178
Approach %	7.4	92.6	0.0	-	-	72.2	27.8	0.0	-	-	86.3	13.7	0.0	-	-	-
Total %	3.0	37.5	0.0	-	40.5	29.7	11.4	0.0	-	41.1	15.9	2.5	0.0	-	18.4	-
Motorcycles	0	7	0	-	7	3	0	0	-	3	6	1	0	-	7	17
% Motorcycles	0.0	0.4	-	-	0.3	0.2	0.0	-	-	0.1	0.7	0.8	-	-	0.7	0.3

[illegible]

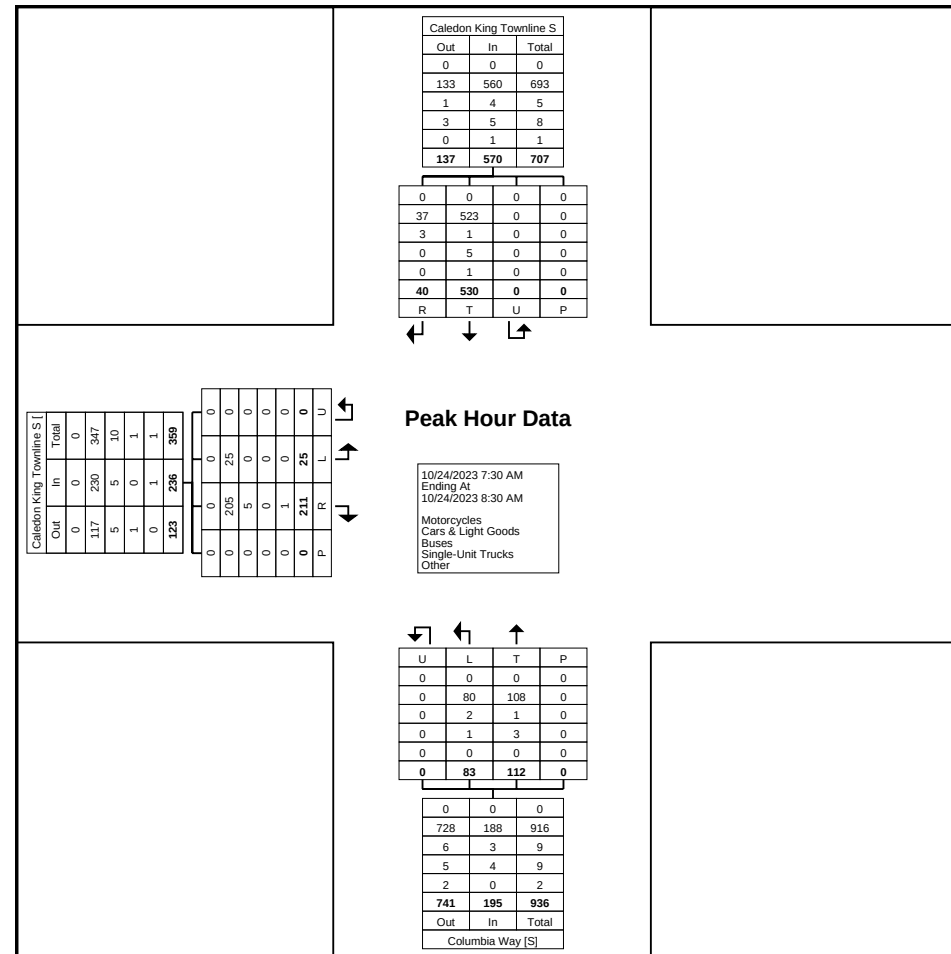
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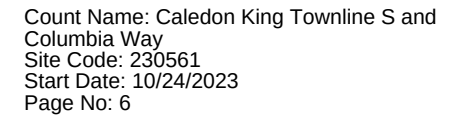
Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsil.com

Count Name: Caledon King Townline S and
Columbia Way
Site Code: 230561
Start Date: 10/24/2023
Page No: 5



Turning Movement Peak Hour Data Plot (7:30 AM)

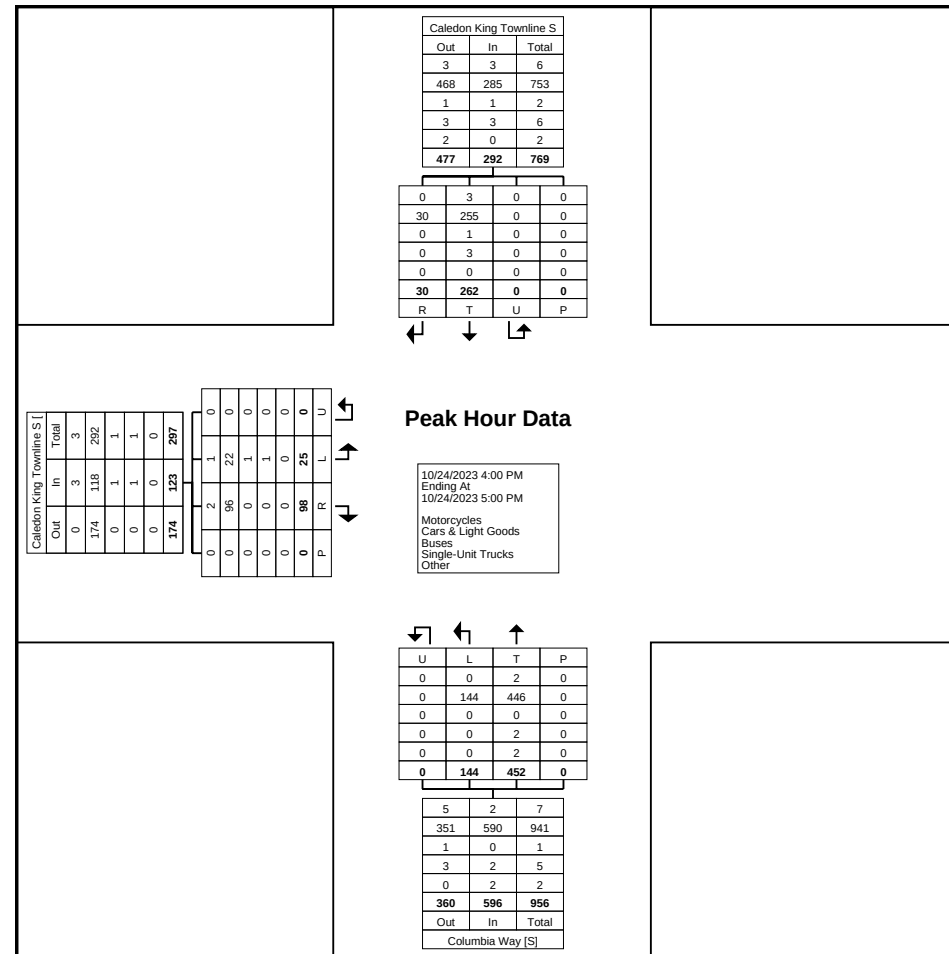
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519-896-3163 cbowness@pts1.com

Count Name: Caledon King Townline S and
Columbia Way
Site Code: 230561
Start Date: 10/24/2023
Page No: 7



Turning Movement Peak Hour Data Plot (4:00 PM)



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

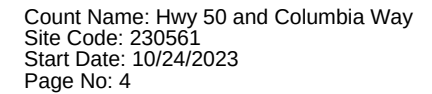
Count Name: Hwy 50 and Columbia Way
Site Code: 230561
Start Date: 10/24/2023
Page No: 1

Turning Movement Data

Start Time	Highway 50 Southbound						Columbia Way Westbound						Highway 50 Northbound						Driveway Eastbound						Int. Total
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	
6:00 AM	1	72	2	0	0	75	8	0	10	0	0	18	4	17	0	0	0	21	0	1	1	0	0	2	116
6:15 AM	0	62	7	0	0	69	6	0	14	0	0	20	2	34	0	0	0	36	1	0	0	0	0	1	126
6:30 AM	3	78	5	0	0	86	14	0	11	0	0	25	6	21	1	0	0	28	0	0	0	0	0	0	139
6:45 AM	9	85	8	0	0	102	17	2	10	0	0	29	5	36	0	0	0	41	0	0	0	0	0	0	172
Hourly Total	13	297	22	0	0	332	45	2	45	0	0	92	17	108	1	0	0	126	1	1	1	0	0	3	553
7:00 AM	3	89	7	0	0	99	11	0	30	0	0	41	7	45	0	0	0	52	0	0	0	0	0	0	192
7:15 AM	1	94	4	0	0	99	22	0	20	0	0	42	12	44	0	0	0	56	0	0	0	0	0	0	197
7:30 AM	0	80	19	0	0	99	26	0	26	0	0	52	21	37	0	0	0	58	0	0	0	0	0	0	209
7:45 AM	0	101	41	0	0	142	32	0	48	0	2	80	51	34	0	0	0	85	0	0	3	0	0	3	310
Hourly Total	4	364	71	0	0	439	91	0	124	0	2	215	91	160	0	0	0	251	0	0	3	0	0	3	908
8:00 AM	0	113	52	0	0	165	61	2	69	0	0	132	44	60	0	0	0	104	2	1	0	0	0	3	404
8:15 AM	0	115	37	0	0	152	30	0	32	0	0	62	26	81	1	0	0	108	1	2	1	0	0	4	326
8:30 AM	0	67	12	0	0	79	30	0	21	0	0	51	21	75	1	0	0	97	5	0	1	0	0	6	233
8:45 AM	0	83	9	0	0	92	15	0	26	0	0	41	21	76	0	0	0	97	0	0	0	0	0	0	230
Hourly Total	0	378	110	0	0	488	136	2	148	0	0	286	112	292	2	0	0	406	8	3	2	0	0	13	1193
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	0	58	20	0	3	78	21	0	17	0	0	38	36	126	0	0	0	162	1	0	0	0	3	1	279
4:15 PM	0	93	17	1	0	111	6	0	10	0	1	16	29	120	0	0	0	149	0	0	0	0	0	0	276
4:30 PM	0	87	21	0	0	108	13	0	14	0	0	27	24	143	0	0	0	167	0	0	1	0	0	1	303
4:45 PM	0	81	28	0	0	109	23	0	31	0	0	54	40	124	1	0	0	165	0	0	1	0	0	1	329
Hourly Total	0	319	86	1	3	406	63	0	72	0	1	135	129	513	1	0	0	643	1	0	2	0	3	3	1187
5:00 PM	1	72	22	0	0	95	11	0	24	0	0	35	62	122	0	0	0	184	0	0	0	0	0	0	314
5:15 PM	1	86	29	0	0	116	13	0	24	0	0	37	25	127	0	0	0	152	1	0	0	0	0	1	306
5:30 PM	0	70	27	0	0	97	15	0	20	0	0	35	46	105	0	0	0	151	1	0	0	0	0	1	284
5:45 PM	1	82	18	0	1	101	9	0	19	0	0	28	33	97	0	0	0	130	0	0	1	0	0	1	260
Hourly Total	3	310	96	0	1	409	48	0	87	0	0	135	166	451	0	0	0	617	2	0	1	0	0	3	1164
6:00 PM	0	75	25	0	0	100	19	0	15	0	0	34	43	102	0	0	0	145	1	0	0	0	0	1	280
6:15 PM	0	89	28	0	0	117	14	0	30	0	0	44	40	114	0	0	0	154	0	0	0	0	0	0	315
6:30 PM	0	68	18	0	0	86	9	0	30	0	0	39	32	107	0	0	0	139	0	0	0	0	0	0	264
6:45 PM	0	76	10	0	0	86	8	0	19	0	0	27	29	86	0	0	0	115	0	0	0	0	0	0	228
Hourly Total	0	308	81	0	0	389	50	0	94	0	0	144	144	409	0	0	0	553	1	0	0	0	0	1	1087
Grand Total	20	1976	466	1	4	2463	433	4	570	0	3	1007	659	1933	4	0	0	2596	13	4	9	0	3	26	6092
Approach %	0.8	80.2	18.9	0.0	-	-	43.0	0.4	56.6	0.0	-	-	25.4	74.5	0.2	0.0	-	-	50.0	15.4	34.6	0.0	-	-	-
Total %	0.3	32.4	7.6	0.0	-	40.4	7.1	0.1	9.4	0.0	-	16.5	10.8	31.7	0.1	0.0	-	42.6	0.2	0.1	0.1	0.0	-	0.4	-
Motorcycles	0	11	3	0	-	14	1	0	1	0	-	2	3	12	0	0	-	15	0	0	0	0	-	0	31

% Motorcycles	0.0	0.6	0.6	0.0	-	0.6	0.2	0.0	0.2	-	-	0.2	0.5	0.6	0.0	-	-	0.6	0.0	0.0	0.0	-	-	0.0	0.5
Cars & Light Goods	17	1932	437	1	-	2387	414	4	556	0	-	974	637	1874	3	0	-	2514	11	2	8	0	-	21	5896
% Cars & Light Goods	85.0	97.8	93.8	100.0	-	96.9	95.6	100.0	97.5	-	-	96.7	96.7	96.9	75.0	-	-	96.8	84.6	50.0	88.9	-	-	80.8	96.8
Buses	3	16	15	0	-	34	16	0	10	0	-	26	16	22	1	0	-	39	1	0	1	0	-	2	101
% Buses	15.0	0.8	3.2	0.0	-	1.4	3.7	0.0	1.8	-	-	2.6	2.4	1.1	25.0	-	-	1.5	7.7	0.0	11.1	-	-	7.7	1.7
Single-Unit Trucks	0	14	9	0	-	23	2	0	3	0	-	5	3	18	0	0	-	21	1	1	0	0	-	2	51
% Single-Unit Trucks	0.0	0.7	1.9	0.0	-	0.9	0.5	0.0	0.5	-	-	0.5	0.5	0.9	0.0	-	-	0.8	7.7	25.0	0.0	-	-	7.7	0.8
Articulated Trucks	0	3	1	0	-	4	0	0	0	0	-	0	0	6	0	0	-	6	0	1	0	0	-	1	11
% Articulated Trucks	0.0	0.2	0.2	0.0	-	0.2	0.0	0.0	0.0	-	-	0.0	0.0	0.3	0.0	-	-	0.2	0.0	25.0	0.0	-	-	3.8	0.2
Bicycles on Road	0	0	1	0	-	1	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	2
% Bicycles on Road	0.0	0.0	0.2	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.1	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	33.3	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	4	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	3	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	66.7	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Turning Movement Data Plot

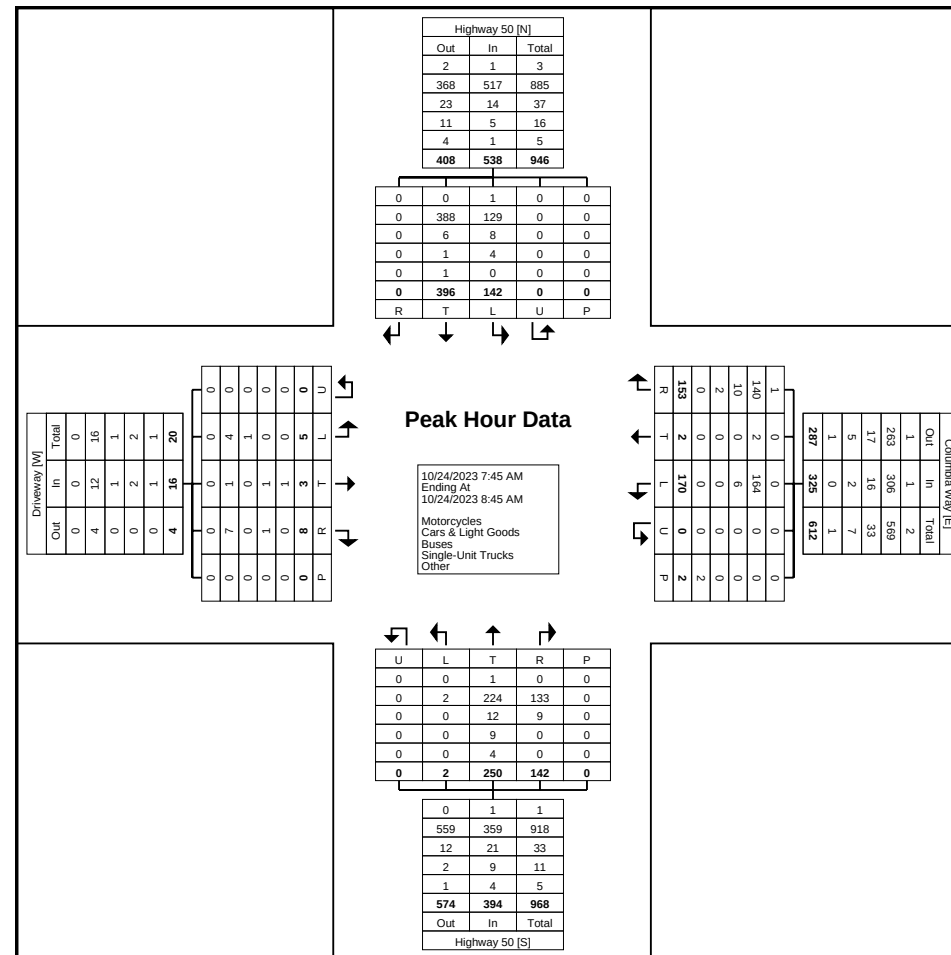
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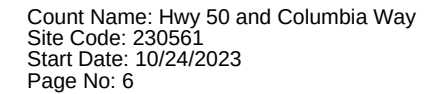
Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cdowness@pts1.com

Count Name: Hwy 50 and Columbia Way
Site Code: 230561
Start Date: 10/24/2023
Page No: 5



Turning Movement Peak Hour Data Plot (7:45 AM)

[illegible]

Turning Movement Peak Hour Data Plot (4:30 PM)



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@pts1.com

Count Name: Kingsview Dr and Columbia Way
Site Code: 230500
Start Date: 10/24/2023
Page No: 1

Turning Movement Data

Start Time	Columbia Way Southbound					Kingsview Dr Westbound					Columbia Way Northbound					Int. Total
	Thru	Left	U-Turn	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	Right	Thru	U-Turn	Peds	App. Total	
6:00 AM	14	2	0	0	16	5	6	0	2	11	0	7	0	0	7	34
6:15 AM	17	1	0	0	18	5	1	0	0	6	2	7	0	0	9	33
6:30 AM	18	2	0	0	20	6	6	0	0	12	1	9	0	0	10	42
6:45 AM	24	3	0	0	27	11	6	0	0	17	0	13	0	0	13	57
Hourly Total	73	8	0	0	81	27	19	0	2	46	3	36	0	0	39	166
7:00 AM	34	3	0	0	37	14	9	0	0	23	3	11	0	0	14	74
7:15 AM	35	3	0	0	38	15	9	0	0	24	2	14	0	0	16	78
7:30 AM	45	8	0	0	53	11	8	0	0	19	3	32	0	0	35	107
7:45 AM	66	13	0	7	79	12	10	0	1	22	2	89	0	0	91	192
Hourly Total	180	27	0	7	207	52	36	0	1	88	10	146	0	0	156	451
8:00 AM	114	39	0	8	153	26	18	0	1	44	10	91	0	5	101	298
8:15 AM	52	44	0	1	96	22	12	0	0	34	17	46	0	1	63	193
8:30 AM	40	9	0	0	49	22	13	0	0	35	9	22	0	0	31	115
8:45 AM	29	11	0	2	40	7	10	0	3	17	6	24	0	0	30	87
Hourly Total	235	103	0	11	338	77	53	0	4	130	42	183	0	6	225	693
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	26	16	0	0	42	12	12	0	1	24	18	39	0	0	57	123
4:15 PM	12	11	0	0	23	8	4	0	2	12	7	39	0	0	46	81
4:30 PM	24	8	0	0	32	16	6	0	2	22	14	32	0	0	46	100
4:45 PM	46	11	0	0	57	13	6	0	5	19	15	51	0	0	66	142
Hourly Total	108	46	0	0	154	49	28	0	10	77	54	161	0	0	215	446
5:00 PM	28	14	0	0	42	8	6	0	1	14	21	59	0	0	80	136
5:15 PM	28	18	0	0	46	9	9	0	1	18	16	41	0	0	57	121
5:30 PM	30	17	0	0	47	10	7	0	1	17	29	43	0	0	72	136
5:45 PM	21	15	0	0	36	13	7	0	0	20	15	39	0	0	54	110
Hourly Total	107	64	0	0	171	40	29	0	3	69	81	182	0	0	263	503
6:00 PM	32	15	0	0	47	9	4	0	2	13	17	49	0	0	66	126
6:15 PM	37	10	0	1	47	9	7	0	2	16	18	53	0	0	71	134
6:30 PM	30	7	0	2	37	10	8	0	2	18	11	37	0	0	48	103
6:45 PM	25	10	0	0	35	9	3	0	1	12	9	29	0	0	38	85
Hourly Total	124	42	0	3	166	37	22	0	7	59	55	168	0	0	223	448
Grand Total	827	290	0	21	1117	282	187	0	27	469	245	876	0	6	1121	2707
Approach %	74.0	26.0	0.0	-	-	60.1	39.9	0.0	-	-	21.9	78.1	0.0	-	-	-
Total %	30.6	10.7	0.0	-	41.3	10.4	6.9	0.0	-	17.3	9.1	32.4	0.0	-	41.4	-
Motorcycles	0	0	0	-	0	1	1	0	-	2	2	3	0	-	5	7
% Motorcycles	0.0	0.0	-	-	0.0	0.4	0.5	-	-	0.4	0.8	0.3	-	-	0.4	0.3

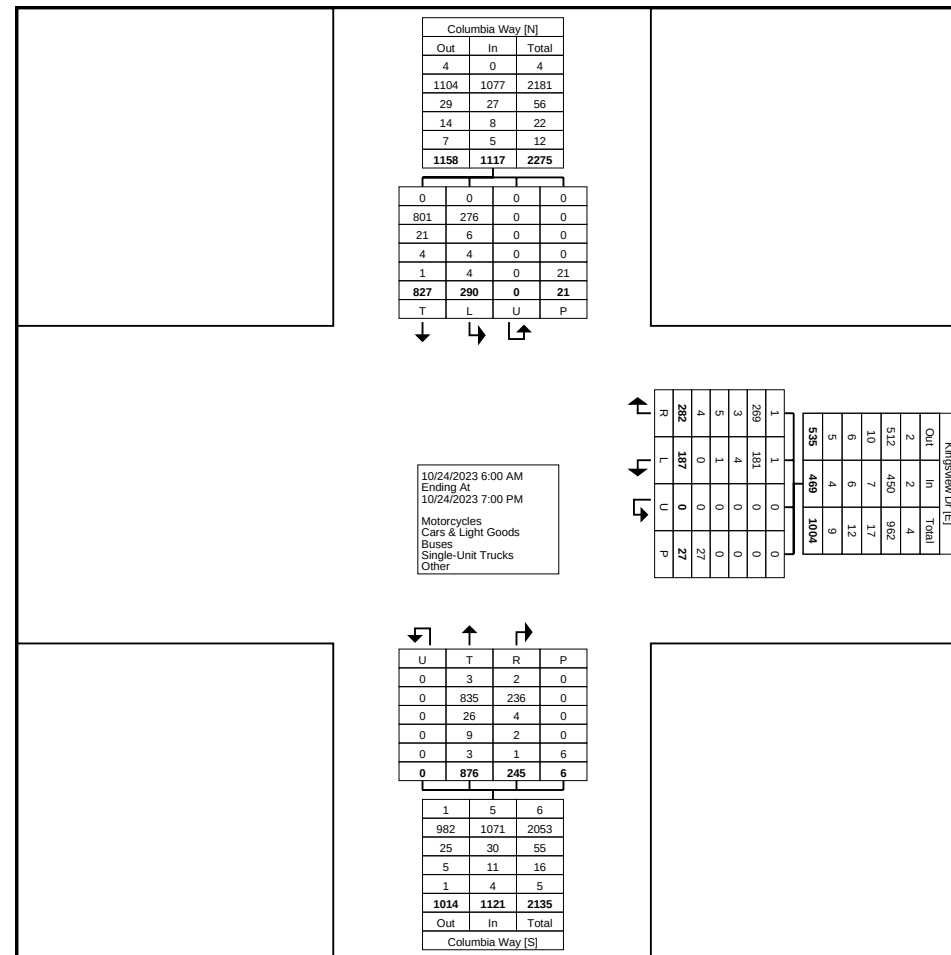
Cars & Light Goods	801	276	0	-	1077	269	181	0	-	450	236	835	0	-	1071	2598
% Cars & Light Goods	96.9	95.2	-	-	96.4	95.4	96.8	-	-	95.9	96.3	95.3	-	-	95.5	96.0
Buses	21	6	0	-	27	3	4	0	-	7	4	26	0	-	30	64
% Buses	2.5	2.1	-	-	2.4	1.1	2.1	-	-	1.5	1.6	3.0	-	-	2.7	2.4
Single-Unit Trucks	4	4	0	-	8	5	1	0	-	6	2	9	0	-	11	25
% Single-Unit Trucks	0.5	1.4	-	-	0.7	1.8	0.5	-	-	1.3	0.8	1.0	-	-	1.0	0.9
Articulated Trucks	0	0	0	-	0	1	0	0	-	1	1	2	0	-	3	4
% Articulated Trucks	0.0	0.0	-	-	0.0	0.4	0.0	-	-	0.2	0.4	0.2	-	-	0.3	0.1
Bicycles on Road	1	4	0	-	5	3	0	0	-	3	0	1	0	-	1	9
% Bicycles on Road	0.1	1.4	-	-	0.4	1.1	0.0	-	-	0.6	0.0	0.1	-	-	0.1	0.3
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	2	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	7.4	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	21	-	-	-	-	25	-	-	-	-	6	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	92.6	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@pts1.com

Count Name: Kingsview Dr and Columbia Way
Site Code: 230500
Start Date: 10/24/2023
Page No: 3



Turning Movement Data Plot



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@pts1.com

Count Name: Kingsview Dr and Columbia Way
Site Code: 230500
Start Date: 10/24/2023
Page No: 4

Turning Movement Peak Hour Data (7:45 AM)

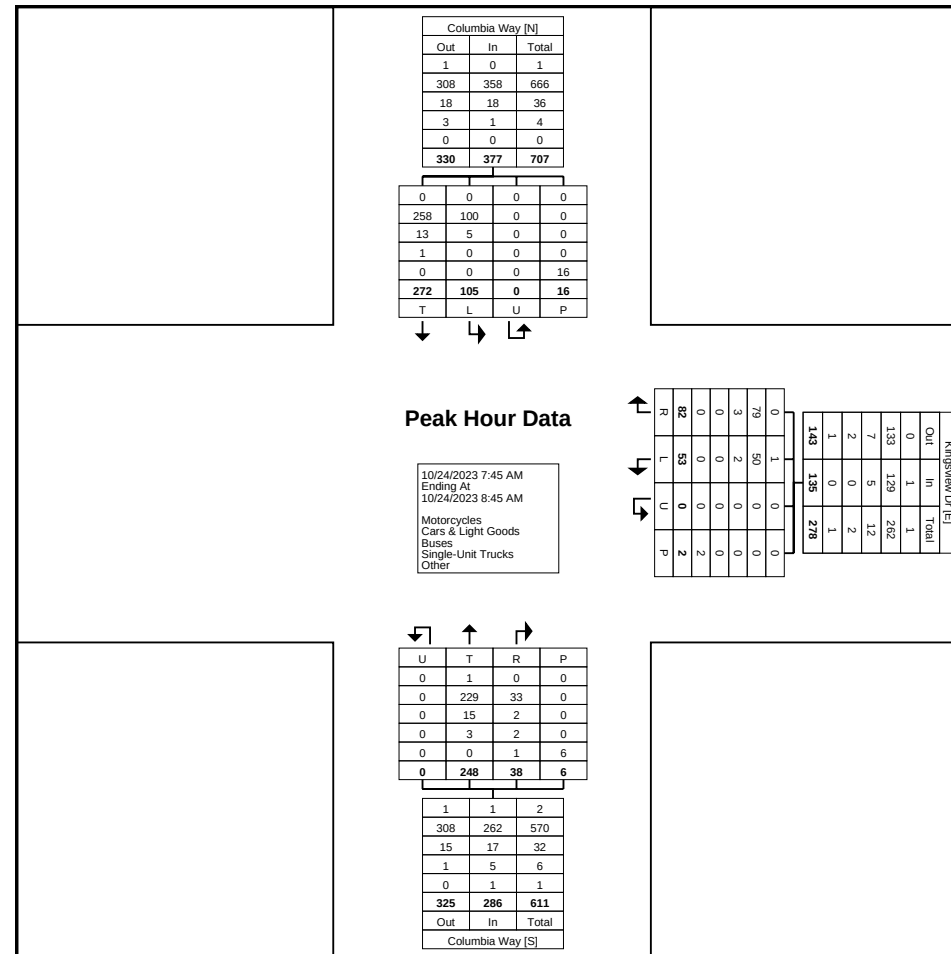
Start Time	Columbia Way Southbound					Kingsview Dr Westbound					Columbia Way Northbound					Int. Total
	Thru	Left	U-Turn	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	Right	Thru	U-Turn	Peds	App. Total	
7:45 AM	66	13	0	7	79	12	10	0	1	22	2	89	0	0	91	192
8:00 AM	114	39	0	8	153	26	18	0	1	44	10	91	0	5	101	298
8:15 AM	52	44	0	1	96	22	12	0	0	34	17	46	0	1	63	193
8:30 AM	40	9	0	0	49	22	13	0	0	35	9	22	0	0	31	115
Total	272	105	0	16	377	82	53	0	2	135	38	248	0	6	286	798
Approach %	72.1	27.9	0.0	-	-	60.7	39.3	0.0	-	-	13.3	86.7	0.0	-	-	-
Total %	34.1	13.2	0.0	-	47.2	10.3	6.6	0.0	-	16.9	4.8	31.1	0.0	-	35.8	-
PHF	0.596	0.597	0.000	-	0.616	0.788	0.736	0.000	-	0.767	0.559	0.681	0.000	-	0.708	0.669
Motorcycles	0	0	0	-	0	0	1	0	-	1	0	1	0	-	1	2
% Motorcycles	0.0	0.0	-	-	0.0	0.0	1.9	-	-	0.7	0.0	0.4	-	-	0.3	0.3
Cars & Light Goods	258	100	0	-	358	79	50	0	-	129	33	229	0	-	262	749
% Cars & Light Goods	94.9	95.2	-	-	95.0	96.3	94.3	-	-	95.6	86.8	92.3	-	-	91.6	93.9
Buses	13	5	0	-	18	3	2	0	-	5	2	15	0	-	17	40
% Buses	4.8	4.8	-	-	4.8	3.7	3.8	-	-	3.7	5.3	6.0	-	-	5.9	5.0
Single-Unit Trucks	1	0	0	-	1	0	0	0	-	0	2	3	0	-	5	6
% Single-Unit Trucks	0.4	0.0	-	-	0.3	0.0	0.0	-	-	0.0	5.3	1.2	-	-	1.7	0.8
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	1	0	0	-	1	1
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	2.6	0.0	-	-	0.3	0.1
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	16	-	-	-	-	2	-	-	-	-	6	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@pts1.com

Count Name: Kingsview Dr and Columbia Way
Site Code: 230500
Start Date: 10/24/2023
Page No: 5





Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@pts1.com

Count Name: Kingsview Dr and Columbia Way
Site Code: 230500
Start Date: 10/24/2023
Page No: 6

Turning Movement Peak Hour Data (4:45 PM)

Start Time	Columbia Way Southbound					Kingsview Dr Westbound					Columbia Way Northbound					Int. Total
	Thru	Left	U-Turn	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	Right	Thru	U-Turn	Peds	App. Total	
4:45 PM	46	11	0	0	57	13	6	0	5	19	15	51	0	0	66	142
5:00 PM	28	14	0	0	42	8	6	0	1	14	21	59	0	0	80	136
5:15 PM	28	18	0	0	46	9	9	0	1	18	16	41	0	0	57	121
5:30 PM	30	17	0	0	47	10	7	0	1	17	29	43	0	0	72	136
Total	132	60	0	0	192	40	28	0	8	68	81	194	0	0	275	535
Approach %	68.8	31.3	0.0	-	-	58.8	41.2	0.0	-	-	29.5	70.5	0.0	-	-	-
Total %	24.7	11.2	0.0	-	35.9	7.5	5.2	0.0	-	12.7	15.1	36.3	0.0	-	51.4	-
PHF	0.717	0.833	0.000	-	0.842	0.769	0.778	0.000	-	0.895	0.698	0.822	0.000	-	0.859	0.942
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	1	0	-	1	1
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.5	-	-	0.4	0.2
Cars & Light Goods	130	59	0	-	189	40	28	0	-	68	81	191	0	-	272	529
% Cars & Light Goods	98.5	98.3	-	-	98.4	100.0	100.0	-	-	100.0	100.0	98.5	-	-	98.9	98.9
Buses	1	0	0	-	1	0	0	0	-	0	0	1	0	-	1	2
% Buses	0.8	0.0	-	-	0.5	0.0	0.0	-	-	0.0	0.0	0.5	-	-	0.4	0.4
Single-Unit Trucks	1	1	0	-	2	0	0	0	-	0	0	1	0	-	1	3
% Single-Unit Trucks	0.8	1.7	-	-	1.0	0.0	0.0	-	-	0.0	0.0	0.5	-	-	0.4	0.6
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	2	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	25.0	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	6	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	75.0	-	-	-	-	-	-	-

Turning Movement Peak Hour Data Plot (4:45 PM)



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

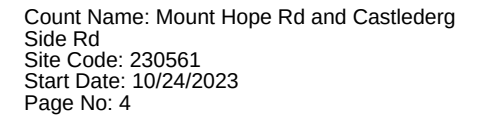
Count Name: Mount Hope Rd and Castlederg
Side Rd
Site Code: 230561
Start Date: 10/24/2023
Page No: 1

Turning Movement Data

Start Time	Mount Hope Rd Southbound						Castlederg Side Rd Westbound						Mount Hope Rd Northbound						Castlederg Side Rd Eastbound						Int. Total
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	
6:00 AM	5	1	2	0	0	8	0	24	0	0	0	24	2	1	1	0	0	4	0	33	0	0	0	33	69
6:15 AM	2	2	4	0	0	8	1	23	0	0	0	24	1	1	0	0	0	2	0	31	0	0	0	31	65
6:30 AM	8	2	1	0	0	11	1	34	1	0	0	36	0	1	1	0	0	2	2	31	0	0	0	33	82
6:45 AM	4	6	4	0	0	14	0	43	0	0	0	43	4	3	0	0	0	7	1	26	0	0	0	27	91
Hourly Total	19	11	11	0	0	41	2	124	1	0	0	127	7	6	2	0	0	15	3	121	0	0	0	124	307
7:00 AM	7	5	11	0	0	23	0	41	1	0	0	42	3	5	0	0	0	8	0	31	2	0	0	33	106
7:15 AM	5	7	4	0	0	16	2	41	0	0	0	43	4	4	0	0	0	8	0	41	2	0	0	43	110
7:30 AM	14	9	12	0	0	35	0	37	3	0	0	40	1	5	2	0	0	8	1	45	3	0	0	49	132
7:45 AM	4	19	2	0	0	25	1	44	5	0	0	50	0	7	3	0	0	10	4	35	2	0	0	41	126
Hourly Total	30	40	29	0	0	99	3	163	9	0	0	175	8	21	5	0	0	34	5	152	9	0	0	166	474
8:00 AM	9	24	6	0	0	39	0	57	5	0	0	62	6	10	0	0	0	16	6	42	2	0	0	50	167
8:15 AM	4	25	1	0	0	30	2	40	4	0	0	46	5	12	3	0	0	20	5	32	1	0	0	38	134
8:30 AM	7	7	3	0	0	17	2	35	1	0	0	38	4	12	1	0	0	17	1	35	3	0	0	39	111
8:45 AM	10	5	3	0	0	18	0	29	3	0	0	32	0	4	1	0	0	5	0	25	1	0	0	26	81
Hourly Total	30	61	13	0	0	104	4	161	13	0	0	178	15	38	5	0	0	58	12	134	7	0	0	153	493
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	1	7	0	0	0	8	4	32	1	0	0	37	0	7	2	0	0	9	2	59	9	0	0	70	124
4:15 PM	1	11	6	0	0	18	4	46	1	0	0	51	2	13	1	0	0	16	2	66	6	0	0	74	159
4:30 PM	1	9	6	0	0	16	5	43	3	0	0	51	2	13	0	0	0	15	2	68	18	0	0	88	170
4:45 PM	2	6	6	0	0	14	3	43	2	0	0	48	6	10	1	0	0	17	2	61	19	0	0	82	161
Hourly Total	5	33	18	0	0	56	16	164	7	0	0	187	10	43	4	0	0	57	8	254	52	0	0	314	614
5:00 PM	2	5	1	0	0	8	5	54	1	0	0	60	2	10	0	0	0	12	2	89	13	0	0	104	184
5:15 PM	3	8	5	0	0	16	11	58	5	0	0	74	1	7	1	0	0	9	1	67	7	0	0	75	174
5:30 PM	2	12	2	0	0	16	3	53	6	0	0	62	3	7	0	0	0	10	3	53	9	0	0	65	153
5:45 PM	5	19	5	0	0	29	7	43	5	0	1	55	1	11	1	0	0	13	3	50	7	0	0	60	157
Hourly Total	12	44	13	0	0	69	26	208	17	0	1	251	7	35	2	0	0	44	9	259	36	0	0	304	668
6:00 PM	2	8	3	0	0	13	2	38	1	0	0	41	2	7	1	0	0	10	2	40	7	0	0	49	113
6:15 PM	4	5	2	0	0	11	1	32	2	0	0	35	0	7	0	0	0	7	3	32	5	0	1	40	93
6:30 PM	4	4	1	0	0	9	3	20	0	0	0	23	0	10	0	0	0	10	2	23	7	0	0	32	74
6:45 PM	1	10	1	0	0	12	3	16	3	0	0	22	0	6	2	0	0	8	2	39	4	0	0	45	87
Hourly Total	11	27	7	0	0	45	9	106	6	0	0	121	2	30	3	0	0	35	9	134	23	0	1	166	367
Grand Total	107	216	91	0	0	414	60	926	53	0	1	1039	49	173	21	0	0	243	46	1054	127	0	1	1227	2923
Approach %	25.8	52.2	22.0	0.0	-	-	5.8	89.1	5.1	0.0	-	-	20.2	71.2	8.6	0.0	-	-	3.7	85.9	10.4	0.0	-	-	-
Total %	3.7	7.4	3.1	0.0	-	14.2	2.1	31.7	1.8	0.0	-	35.5	1.7	5.9	0.7	0.0	-	8.3	1.6	36.1	4.3	0.0	-	42.0	-
Motorcycles	1	3	0	0	-	4	0	3	0	0	-	3	0	0	0	0	-	0	0	2	1	0	-	3	10

[illegible]

Turning Movement Data Plot



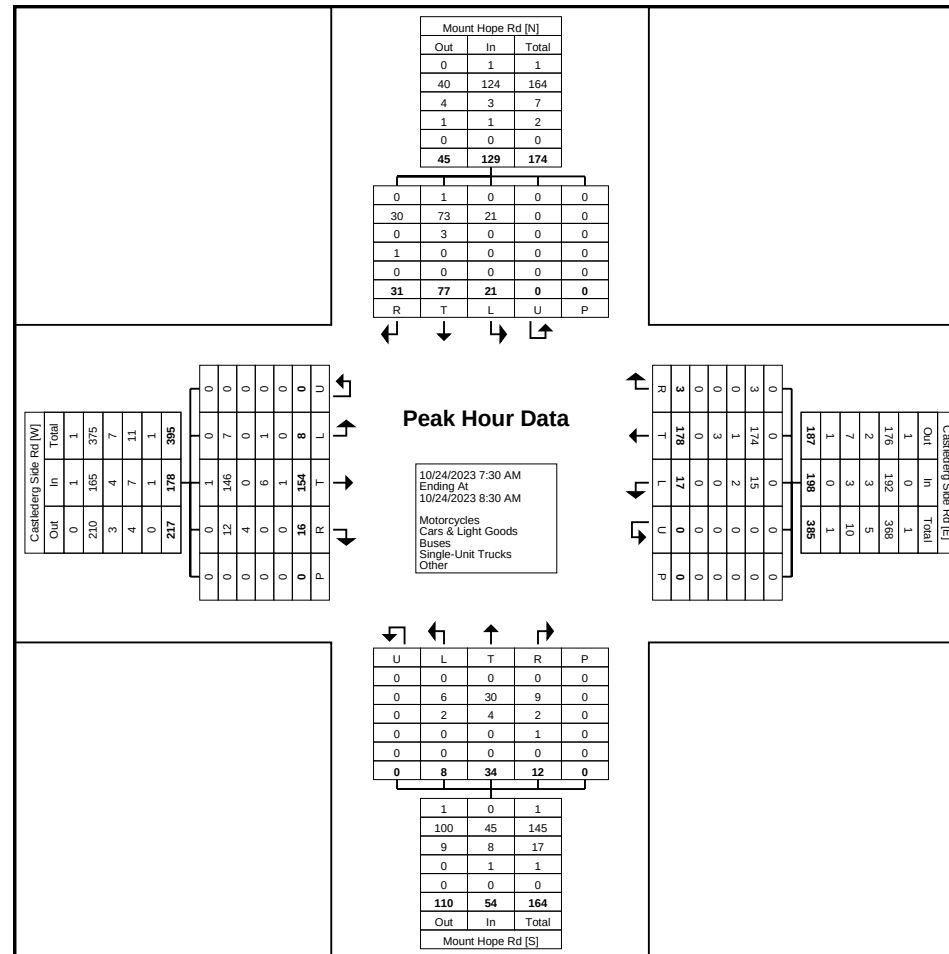
Start Time	Mount Hope Rd Southbound						Castleberg Side Rd Westbound						Mount Hope Rd Northbound						Castleberg Side Rd Eastbound						Int. Total
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	
7:30 AM	14	9	12	0	0	35	0	37	3	0	0	40	1	5	2	0	0	8	1	45	3	0	0	49	132
7:45 AM	4	19	2	0	0	25	1	44	5	0	0	50	0	7	3	0	0	10	4	35	2	0	0	41	126
8:00 AM	9	24	6	0	0	39	0	57	5	0	0	62	6	10	0	0	0	16	6	42	2	0	0	50	167
8:15 AM	4	25	1	0	0	30	2	40	4	0	0	46	5	12	3	0	0	20	5	32	1	0	0	38	134
Total	31	77	21	0	0	129	3	178	17	0	0	198	12	34	8	0	0	54	16	154	8	0	0	178	559
Approach %	24.0	59.7	16.3	0.0	-	-	1.5	89.9	8.6	0.0	-	-	22.2	63.0	14.8	0.0	-	-	9.0	86.5	4.5	0.0	-	-	-
Total %	5.5	13.8	3.8	0.0	-	23.1	0.5	31.8	3.0	0.0	-	35.4	2.1	6.1	1.4	0.0	-	9.7	2.9	27.5	1.4	0.0	-	31.8	-
PHF	0.554	0.770	0.438	0.000	-	0.827	0.375	0.781	0.850	0.000	-	0.798	0.500	0.708	0.667	0.000	-	0.675	0.667	0.856	0.667	0.000	-	0.890	0.837
Motorcycles	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	2
% Motorcycles	0.0	1.3	0.0	-	-	0.8	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.6	0.0	-	-	0.6	0.4
Cars & Light Goods	30	73	21	0	-	124	3	174	15	0	-	192	9	30	6	0	-	45	12	146	7	0	-	165	526
% Cars & Light Goods	96.8	94.8	100.0	-	-	96.1	100.0	97.8	88.2	-	-	97.0	75.0	88.2	75.0	-	-	83.3	75.0	94.8	87.5	-	-	92.7	94.1
Buses	0	3	0	0	-	3	0	1	2	0	-	3	2	4	2	0	-	8	4	0	0	0	-	4	18
% Buses	0.0	3.9	0.0	-	-	2.3	0.0	0.6	11.8	-	-	1.5	16.7	11.8	25.0	-	-	14.8	25.0	0.0	0.0	-	-	2.2	3.2
Single-Unit Trucks	1	0	0	0	-	1	0	3	0	0	-	3	1	0	0	0	-	1	0	6	1	0	-	7	12
% Single-Unit Trucks	3.2	0.0	0.0	-	-	0.8	0.0	1.7	0.0	-	-	1.5	8.3	0.0	0.0	-	-	1.9	0.0	3.9	12.5	-	-	3.9	2.1
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	1
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.6	0.0	-	-	0.6	0.2
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

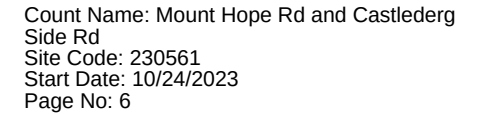


Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@pts1.com

Count Name: Mount Hope Rd and Castlederg
Side Rd
Site Code: 230561
Start Date: 10/24/2023
Page No: 5





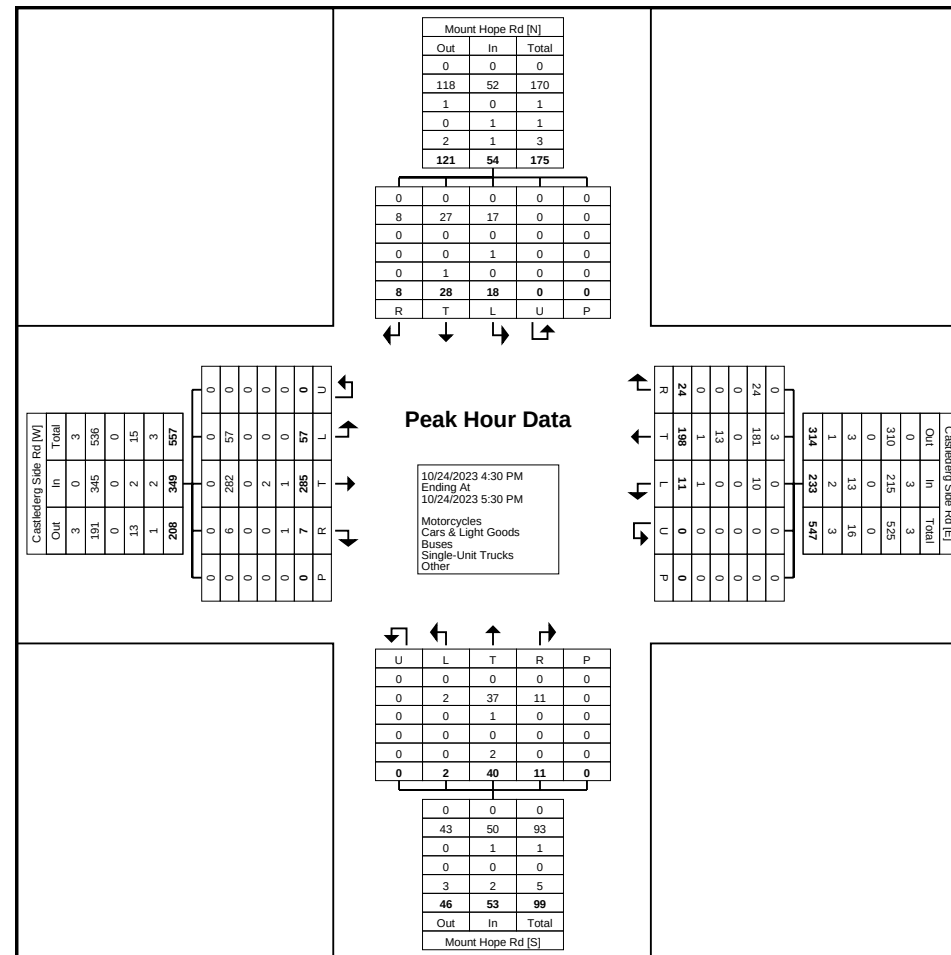
Start Time	Mount Hope Rd Southbound						Castlederg Side Rd Westbound						Mount Hope Rd Northbound						Castlederg Side Rd Eastbound						Int. Total
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	
4:30 PM	1	9	6	0	0	16	5	43	3	0	0	51	2	13	0	0	0	15	2	68	18	0	0	88	170
4:45 PM	2	6	6	0	0	14	3	43	2	0	0	48	6	10	1	0	0	17	2	61	19	0	0	82	161
5:00 PM	2	5	1	0	0	8	5	54	1	0	0	60	2	10	0	0	0	12	2	89	13	0	0	104	184
5:15 PM	3	8	5	0	0	16	11	58	5	0	0	74	1	7	1	0	0	9	1	67	7	0	0	75	174
Total	8	28	18	0	0	54	24	198	11	0	0	233	11	40	2	0	0	53	7	285	57	0	0	349	689
Approach %	14.8	51.9	33.3	0.0	-	-	10.3	85.0	4.7	0.0	-	-	20.8	75.5	3.8	0.0	-	-	2.0	81.7	16.3	0.0	-	-	-
Total %	1.2	4.1	2.6	0.0	-	7.8	3.5	28.7	1.6	0.0	-	33.8	1.6	5.8	0.3	0.0	-	7.7	1.0	41.4	8.3	0.0	-	50.7	-
PHF	0.667	0.778	0.750	0.000	-	0.844	0.545	0.853	0.550	0.000	-	0.787	0.458	0.769	0.500	0.000	-	0.779	0.875	0.801	0.750	0.000	-	0.839	0.936
Motorcycles	0	0	0	0	-	0	0	3	0	0	-	3	0	0	0	0	-	0	0	0	0	0	-	0	3
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	1.5	0.0	-	-	1.3	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.4
Cars & Light Goods	8	27	17	0	-	52	24	181	10	0	-	215	11	37	2	0	-	50	6	282	57	0	-	345	662
% Cars & Light Goods	100.0	96.4	94.4	-	-	96.3	100.0	91.4	90.9	-	-	92.3	100.0	92.5	100.0	-	-	94.3	85.7	98.9	100.0	-	-	98.9	96.1
Buses	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	1
% Buses	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	2.5	0.0	-	-	1.9	0.0	0.0	0.0	-	-	0.0	0.1
Single-Unit Trucks	0	0	1	0	-	1	0	13	0	0	-	13	0	0	0	0	-	0	0	2	0	0	-	2	16
% Single-Unit Trucks	0.0	0.0	5.6	-	-	1.9	0.0	6.6	0.0	-	-	5.6	0.0	0.0	0.0	-	-	0.0	0.0	0.7	0.0	-	-	0.6	2.3
Articulated Trucks	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.5	0.0	-	-	0.4	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	0	1	0	0	-	1	0	0	1	0	-	1	0	2	0	0	-	2	1	1	0	0	-	2	6
% Bicycles on Road	0.0	3.6	0.0	-	-	1.9	0.0	0.0	9.1	-	-	0.4	0.0	5.0	0.0	-	-	3.8	14.3	0.4	0.0	-	-	0.6	0.9
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@pts1.com

Count Name: Mount Hope Rd and Castlederg
Side Rd
Site Code: 230561
Start Date: 10/24/2023
Page No: 7



Turning Movement Peak Hour Data Plot (4:30 PM)



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Mount Hope Rd and Columbia Way
Site Code: 230561
Start Date: 10/24/2023
Page No: 1

Turning Movement Data

Start Time	Mount Hope Rd Southbound						Columbia Way Westbound						Mount Hope Rd Northbound						Columbia Way Eastbound						Int. Total
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	
6:00 AM	1	0	1	0	0	2	0	5	0	0	0	5	3	0	1	0	1	4	1	9	3	0	0	13	24
6:15 AM	2	0	0	0	0	2	0	6	0	0	1	6	1	0	2	0	0	3	0	14	2	0	0	16	27
6:30 AM	2	0	3	0	0	5	0	9	0	0	0	9	5	1	3	0	0	9	1	22	2	0	0	25	48
6:45 AM	3	0	7	0	0	10	2	14	0	0	0	16	7	0	5	0	0	12	1	15	4	0	0	20	58
Hourly Total	8	0	11	0	0	19	2	34	0	0	1	36	16	1	11	0	1	28	3	60	11	0	0	74	157
7:00 AM	5	0	2	0	0	7	1	15	0	0	0	16	2	3	4	0	0	9	1	24	4	0	0	29	61
7:15 AM	5	1	2	0	0	8	1	20	0	0	0	21	4	3	4	0	1	11	0	23	5	0	0	28	68
7:30 AM	7	0	5	0	1	12	5	27	2	0	1	34	1	4	1	0	1	6	4	21	4	0	1	29	81
7:45 AM	14	3	5	0	0	22	3	45	0	0	0	48	3	3	4	0	3	10	1	33	5	0	2	39	119
Hourly Total	31	4	14	0	1	49	10	107	2	0	1	119	10	13	13	0	5	36	6	101	18	0	3	125	329
8:00 AM	36	0	6	1	0	43	1	74	1	0	0	76	2	0	19	0	2	21	6	42	17	0	0	65	205
8:15 AM	29	1	6	0	0	36	3	33	0	0	0	36	4	4	13	0	0	21	4	38	11	0	0	53	146
8:30 AM	8	1	4	0	0	13	2	26	0	0	0	28	3	1	3	0	1	7	4	34	13	0	0	51	99
8:45 AM	9	0	1	0	0	10	2	16	0	0	0	18	1	0	6	0	3	7	1	21	8	0	0	30	65
Hourly Total	82	2	17	1	0	102	8	149	1	0	0	158	10	5	41	0	6	56	15	135	49	0	0	199	515
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	8	1	0	0	0	9	4	28	3	0	0	35	2	0	2	0	5	4	9	29	5	0	0	43	91
4:15 PM	4	0	7	0	0	11	4	28	1	0	0	33	3	0	2	0	3	5	5	19	12	0	0	36	85
4:30 PM	6	3	5	0	0	14	2	31	4	0	0	37	5	1	2	0	2	8	7	27	14	0	0	48	107
4:45 PM	6	1	4	0	0	11	3	33	1	0	0	37	6	3	4	0	3	13	6	41	13	0	0	60	121
Hourly Total	24	5	16	0	0	45	13	120	9	0	0	142	16	4	10	0	13	30	27	116	44	0	0	187	404
5:00 PM	6	3	5	0	0	14	3	29	4	0	0	36	3	2	1	0	2	6	5	41	9	0	0	55	111
5:15 PM	7	2	1	0	0	10	1	39	4	0	0	44	4	0	1	0	4	5	7	27	12	0	0	46	105
5:30 PM	15	2	4	0	0	21	2	46	7	0	0	55	2	2	4	0	2	8	8	36	7	0	0	51	135
5:45 PM	21	5	8	0	0	34	5	28	2	0	0	35	2	1	0	0	3	3	7	38	8	0	0	53	125
Hourly Total	49	12	18	0	0	79	11	142	17	0	0	170	11	5	6	0	11	22	27	142	36	0	0	205	476
6:00 PM	5	3	4	0	0	12	4	39	2	0	0	45	1	0	4	0	5	5	4	32	4	0	0	40	102
6:15 PM	7	0	2	0	0	9	5	29	3	0	0	37	1	0	1	0	9	2	4	29	6	0	0	39	87
6:30 PM	2	1	3	1	0	7	1	34	3	0	0	38	1	1	1	0	5	3	5	23	6	0	0	34	82
6:45 PM	5	3	5	0	0	13	4	24	0	0	0	28	3	2	3	0	0	8	6	27	5	0	0	38	87
Hourly Total	19	7	14	1	0	41	14	126	8	0	0	148	6	3	9	0	19	18	19	111	21	0	0	151	358
Grand Total	213	30	90	2	1	335	58	678	37	0	2	773	69	31	90	0	55	190	97	665	179	0	3	941	2239
Approach %	63.6	9.0	26.9	0.6	-	-	7.5	87.7	4.8	0.0	-	-	36.3	16.3	47.4	0.0	-	-	10.3	70.7	19.0	0.0	-	-	-
Total %	9.5	1.3	4.0	0.1	-	15.0	2.6	30.3	1.7	0.0	-	34.5	3.1	1.4	4.0	0.0	-	8.5	4.3	29.7	8.0	0.0	-	42.0	-
Motorcycles	0	1	2	0	-	3	0	0	0	0	-	0	0	0	0	0	-	0	0	4	0	0	-	4	7

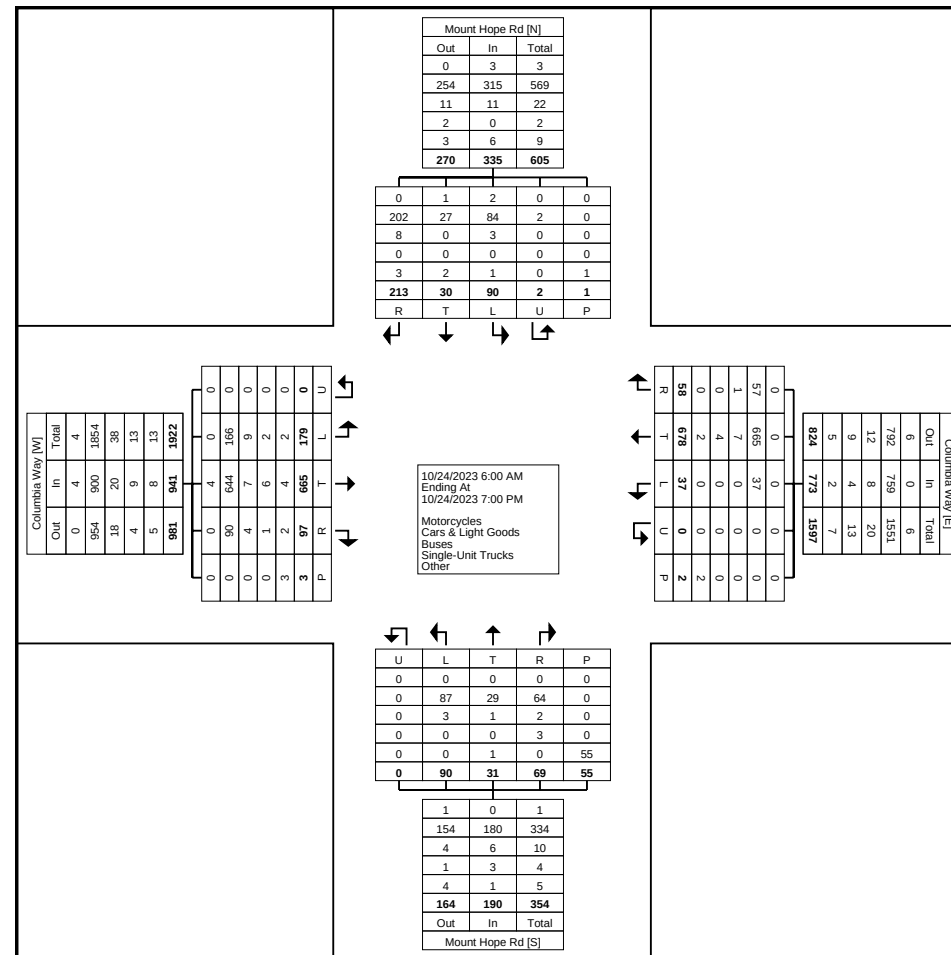
% Motorcycles	0.0	3.3	2.2	0.0	-	0.9	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.6	0.0	-	-	0.4	0.3
Cars & Light Goods	202	27	84	2	-	315	57	665	37	0	-	759	64	29	87	0	-	180	90	644	166	0	-	900	2154
% Cars & Light Goods	94.8	90.0	93.3	100.0	-	94.0	98.3	98.1	100.0	-	-	98.2	92.8	93.5	96.7	-	-	94.7	92.8	96.8	92.7	-	-	95.6	96.2
Buses	8	0	3	0	-	11	1	7	0	0	-	8	2	1	3	0	-	6	4	7	9	0	-	20	45
% Buses	3.8	0.0	3.3	0.0	-	3.3	1.7	1.0	0.0	-	-	1.0	2.9	3.2	3.3	-	-	3.2	4.1	1.1	5.0	-	-	2.1	2.0
Single-Unit Trucks	0	0	0	0	-	0	0	4	0	0	-	4	3	0	0	0	-	3	1	6	2	0	-	9	16
% Single-Unit Trucks	0.0	0.0	0.0	0.0	-	0.0	0.0	0.6	0.0	-	-	0.5	4.3	0.0	0.0	-	-	1.6	1.0	0.9	1.1	-	-	1.0	0.7
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	2	0	0	-	2	2
% Articulated Trucks	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.3	0.0	-	-	0.2	0.1
Bicycles on Road	3	2	1	0	-	6	0	2	0	0	-	2	0	1	0	0	-	1	2	2	2	0	-	6	15
% Bicycles on Road	1.4	6.7	1.1	0.0	-	1.8	0.0	0.3	0.0	-	-	0.3	0.0	3.2	0.0	-	-	0.5	2.1	0.3	1.1	-	-	0.6	0.7
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	1.8	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	1	-	-	-	-	-	2	-	-	-	-	-	54	-	-	-	-	-	3	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	98.2	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsll.com

Count Name: Mount Hope Rd and Columbia
Way
Site Code: 230561
Start Date: 10/24/2023
Page No: 3



Turning Movement Data Plot



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Mount Hope Rd and Columbia Way
Site Code: 230561
Start Date: 10/24/2023
Page No: 4

Turning Movement Peak Hour Data (7:45 AM)

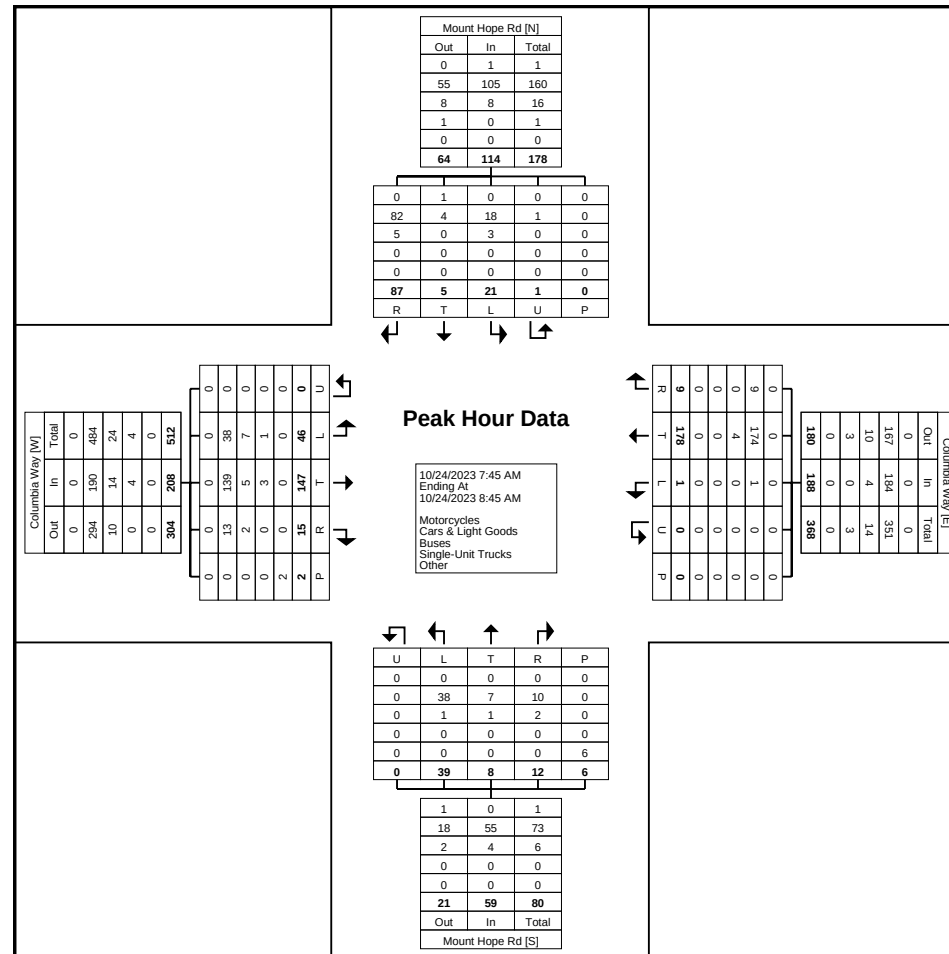
Start Time	Mount Hope Rd Southbound						Columbia Way Westbound						Mount Hope Rd Northbound						Columbia Way Eastbound						Int. Total
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	
7:45 AM	14	3	5	0	0	22	3	45	0	0	0	48	3	3	4	0	3	10	1	33	5	0	2	39	119
8:00 AM	36	0	6	1	0	43	1	74	1	0	0	76	2	0	19	0	2	21	6	42	17	0	0	65	205
8:15 AM	29	1	6	0	0	36	3	33	0	0	0	36	4	4	13	0	0	21	4	38	11	0	0	53	146
8:30 AM	8	1	4	0	0	13	2	26	0	0	0	28	3	1	3	0	1	7	4	34	13	0	0	51	99
Total	87	5	21	1	0	114	9	178	1	0	0	188	12	8	39	0	6	59	15	147	46	0	2	208	569
Approach %	76.3	4.4	18.4	0.9	-	-	4.8	94.7	0.5	0.0	-	-	20.3	13.6	66.1	0.0	-	-	7.2	70.7	22.1	0.0	-	-	-
Total %	15.3	0.9	3.7	0.2	-	20.0	1.6	31.3	0.2	0.0	-	33.0	2.1	1.4	6.9	0.0	-	10.4	2.6	25.8	8.1	0.0	-	36.6	-
PHF	0.604	0.417	0.875	0.250	-	0.663	0.750	0.601	0.250	0.000	-	0.618	0.750	0.500	0.513	0.000	-	0.702	0.625	0.875	0.676	0.000	-	0.800	0.694
Motorcycles	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1
% Motorcycles	0.0	20.0	0.0	0.0	-	0.9	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.2
Cars & Light Goods	82	4	18	1	-	105	9	174	1	0	-	184	10	7	38	0	-	55	13	139	38	0	-	190	534
% Cars & Light Goods	94.3	80.0	85.7	100.0	-	92.1	100.0	97.8	100.0	-	-	97.9	83.3	87.5	97.4	-	-	93.2	86.7	94.6	82.6	-	-	91.3	93.8
Buses	5	0	3	0	-	8	0	4	0	0	-	4	2	1	1	0	-	4	2	5	7	0	-	14	30
% Buses	5.7	0.0	14.3	0.0	-	7.0	0.0	2.2	0.0	-	-	2.1	16.7	12.5	2.6	-	-	6.8	13.3	3.4	15.2	-	-	6.7	5.3
Single-Unit Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	3	1	0	-	4	4
% Single-Unit Trucks	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	2.0	2.2	-	-	1.9	0.7
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	6	-	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@pts1.com

Count Name: Mount Hope Rd and Columbia
Way
Site Code: 230561
Start Date: 10/24/2023
Page No: 5



Turning Movement Peak Hour Data Plot (7:45 AM)



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Mount Hope Rd and Columbia Way
Site Code: 230561
Start Date: 10/24/2023
Page No: 6

Turning Movement Peak Hour Data (5:00 PM)

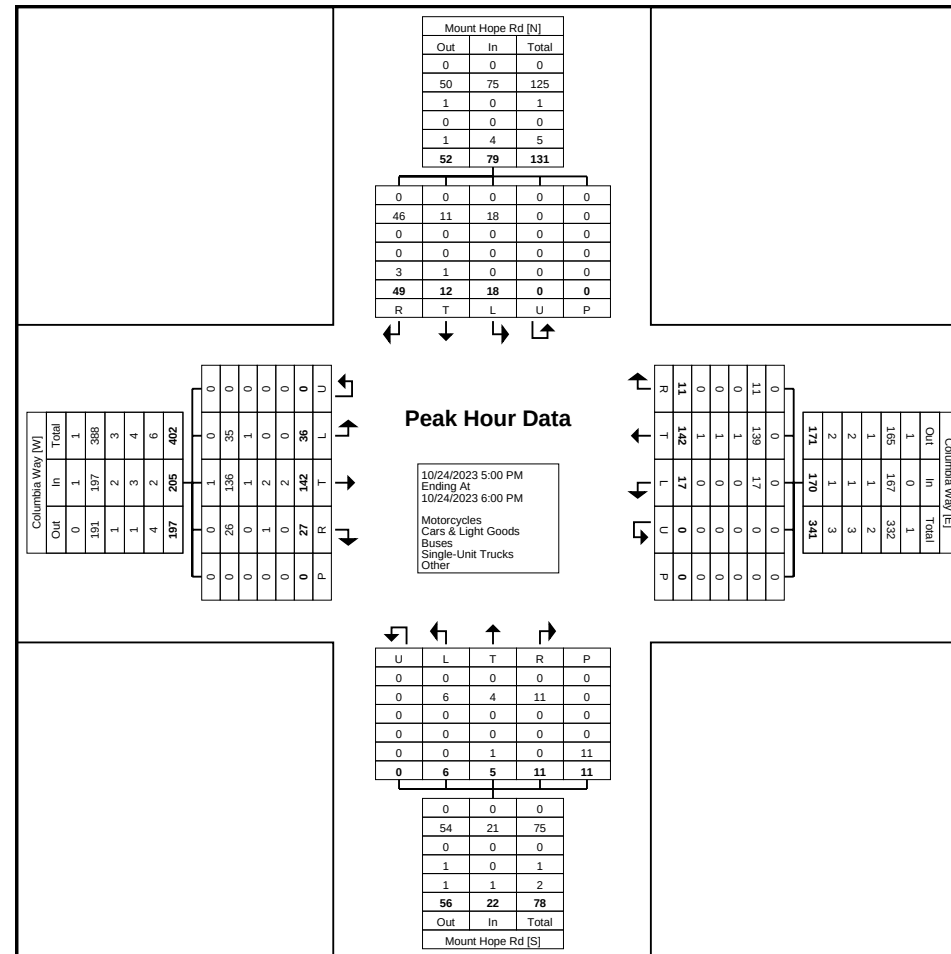
Start Time	Mount Hope Rd Southbound						Columbia Way Westbound						Mount Hope Rd Northbound						Columbia Way Eastbound						Int. Total
	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	Right	Thru	Left	U-Turn	Peds	App. Total	
5:00 PM	6	3	5	0	0	14	3	29	4	0	0	36	3	2	1	0	2	6	5	41	9	0	0	55	111
5:15 PM	7	2	1	0	0	10	1	39	4	0	0	44	4	0	1	0	4	5	7	27	12	0	0	46	105
5:30 PM	15	2	4	0	0	21	2	46	7	0	0	55	2	2	4	0	2	8	8	36	7	0	0	51	135
5:45 PM	21	5	8	0	0	34	5	28	2	0	0	35	2	1	0	0	3	3	7	38	8	0	0	53	125
Total	49	12	18	0	0	79	11	142	17	0	0	170	11	5	6	0	11	22	27	142	36	0	0	205	476
Approach %	62.0	15.2	22.8	0.0	-	-	6.5	83.5	10.0	0.0	-	-	50.0	22.7	27.3	0.0	-	-	13.2	69.3	17.6	0.0	-	-	-
Total %	10.3	2.5	3.8	0.0	-	16.6	2.3	29.8	3.6	0.0	-	35.7	2.3	1.1	1.3	0.0	-	4.6	5.7	29.8	7.6	0.0	-	43.1	-
PHF	0.583	0.600	0.563	0.000	-	0.581	0.550	0.772	0.607	0.000	-	0.773	0.688	0.625	0.375	0.000	-	0.688	0.844	0.866	0.750	0.000	-	0.932	0.881
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	1
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.7	0.0	-	-	0.5	0.2
Cars & Light Goods	46	11	18	0	-	75	11	139	17	0	-	167	11	4	6	0	-	21	26	136	35	0	-	197	460
% Cars & Light Goods	93.9	91.7	100.0	-	-	94.9	100.0	97.9	100.0	-	-	98.2	100.0	80.0	100.0	-	-	95.5	96.3	95.8	97.2	-	-	96.1	96.6
Buses	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	0	1	1	0	-	2	3
% Buses	0.0	0.0	0.0	-	-	0.0	0.0	0.7	0.0	-	-	0.6	0.0	0.0	0.0	-	-	0.0	0.0	0.7	2.8	-	-	1.0	0.6
Single-Unit Trucks	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	1	2	0	0	-	3	4
% Single-Unit Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.7	0.0	-	-	0.6	0.0	0.0	0.0	-	-	0.0	3.7	1.4	0.0	-	-	1.5	0.8
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	3	1	0	0	-	4	0	1	0	0	-	1	0	1	0	0	-	1	0	2	0	0	-	2	8
% Bicycles on Road	6.1	8.3	0.0	-	-	5.1	0.0	0.7	0.0	-	-	0.6	0.0	20.0	0.0	-	-	4.5	0.0	1.4	0.0	-	-	1.0	1.7
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.1	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	10	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	90.9	-	-	-	-	-	-	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsI.com

Count Name: Mount Hope Rd and Columbia
Way
Site Code: 230561
Start Date: 10/24/2023
Page No: 7



Turning Movement Peak Hour Data Plot (5:00 PM)



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@pts1.com

Count Name: Westchester Blvd and Columbia Way
Site Code: 230561
Start Date: 10/24/2023
Page No: 1

Turning Movement Data

Start Time	Columbia Way Southbound					Westchester Blvd Westbound					Columbia Way Northbound					Int. Total
	Thru	Left	U-Turn	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	Right	Thru	U-Turn	Peds	App. Total	
6:00 AM	7	0	0	0	7	6	9	0	1	15	1	8	0	0	9	31
6:15 AM	9	1	0	0	10	7	9	0	0	16	2	11	0	0	13	39
6:30 AM	13	2	0	0	15	12	7	0	0	19	3	13	0	0	16	50
6:45 AM	20	3	0	0	23	6	9	0	0	15	2	15	0	0	17	55
Hourly Total	49	6	0	0	55	31	34	0	1	65	8	47	0	0	55	175
7:00 AM	21	2	0	0	23	11	16	0	0	27	2	19	0	0	21	71
7:15 AM	27	3	0	0	30	13	10	0	1	23	6	14	0	0	20	73
7:30 AM	33	1	0	0	34	12	26	0	0	38	2	18	0	0	20	92
7:45 AM	53	8	0	0	61	15	19	0	2	34	6	26	0	0	32	127
Hourly Total	134	14	0	0	148	51	71	0	3	122	16	77	0	0	93	363
8:00 AM	111	21	0	0	132	23	40	0	1	63	18	43	0	0	61	256
8:15 AM	52	27	0	0	79	16	25	0	0	41	24	37	0	0	61	181
8:30 AM	31	6	0	0	37	17	9	0	0	26	11	31	0	0	42	105
8:45 AM	27	4	0	0	31	8	13	0	3	21	9	22	0	0	31	83
Hourly Total	221	58	0	0	279	64	87	0	4	151	62	133	0	0	195	625
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	31	8	0	0	39	8	7	0	4	15	16	38	0	0	54	108
4:15 PM	21	13	0	0	34	5	3	0	4	8	17	27	0	0	44	86
4:30 PM	29	7	0	0	36	8	10	0	2	18	8	40	0	0	48	102
4:45 PM	36	9	0	0	45	11	17	0	3	28	14	48	0	0	62	135
Hourly Total	117	37	0	0	154	32	37	0	13	69	55	153	0	0	208	431
5:00 PM	28	7	0	0	35	3	11	0	1	14	18	53	0	0	71	120
5:15 PM	34	14	0	0	48	11	11	0	0	22	16	35	0	0	51	121
5:30 PM	45	18	0	0	63	12	7	0	2	19	18	39	0	0	57	139
5:45 PM	24	26	0	0	50	13	9	0	1	22	16	37	0	0	53	125
Hourly Total	131	65	0	0	196	39	38	0	4	77	68	164	0	0	232	505
6:00 PM	30	19	0	0	49	8	14	0	3	22	13	32	0	0	45	116
6:15 PM	23	13	0	0	36	7	9	0	4	16	18	32	0	0	50	102
6:30 PM	21	12	0	0	33	8	10	0	2	18	20	29	0	0	49	100
6:45 PM	22	9	0	0	31	4	8	0	0	12	7	31	0	0	38	81
Hourly Total	96	53	0	0	149	27	41	0	9	68	58	124	0	0	182	399
Grand Total	748	233	0	0	981	244	308	0	34	552	267	698	0	0	965	2498
Approach %	76.2	23.8	0.0	-	-	44.2	55.8	0.0	-	-	27.7	72.3	0.0	-	-	-
Total %	29.9	9.3	0.0	-	39.3	9.8	12.3	0.0	-	22.1	10.7	27.9	0.0	-	38.6	-
Motorcycles	0	0	0	-	0	1	0	0	-	1	0	1	0	-	1	2
% Motorcycles	0.0	0.0	-	-	0.0	0.4	0.0	-	-	0.2	0.0	0.1	-	-	0.1	0.1

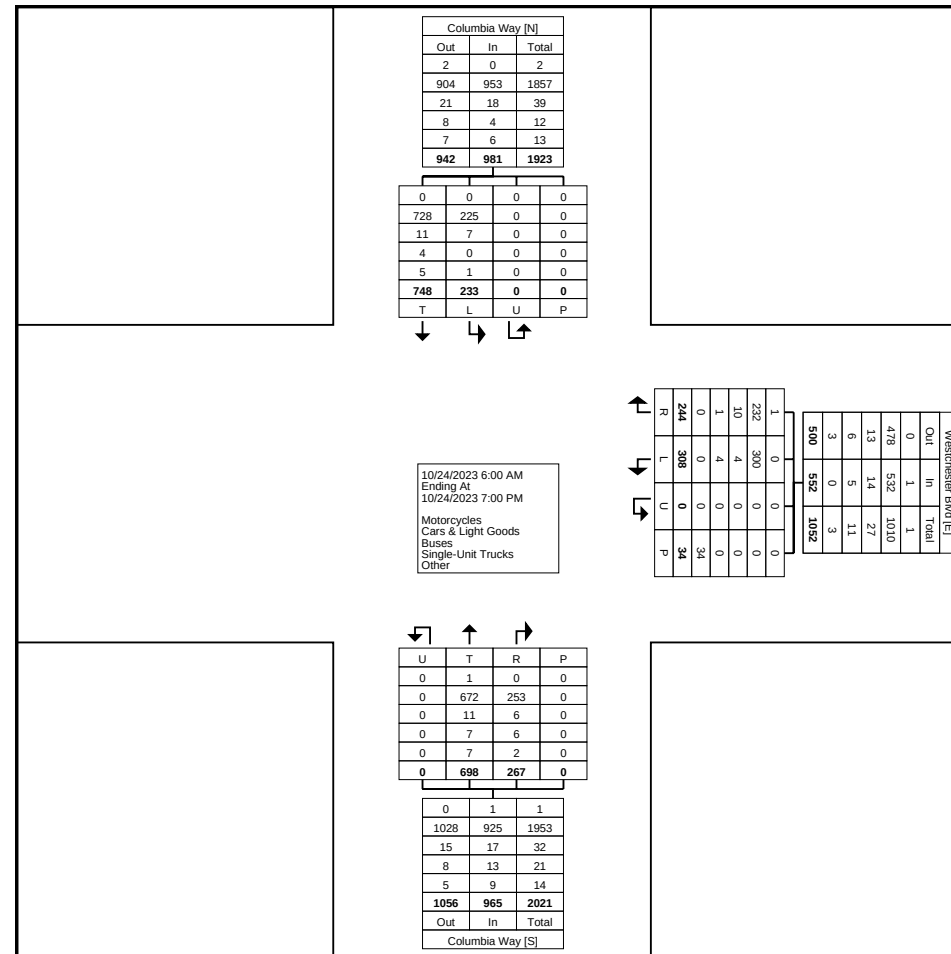
Cars & Light Goods	728	225	0	-	953	232	300	0	-	532	253	672	0	-	925	2410
% Cars & Light Goods	97.3	96.6	-	-	97.1	95.1	97.4	-	-	96.4	94.8	96.3	-	-	95.9	96.5
Buses	11	7	0	-	18	10	4	0	-	14	6	11	0	-	17	49
% Buses	1.5	3.0	-	-	1.8	4.1	1.3	-	-	2.5	2.2	1.6	-	-	1.8	2.0
Single-Unit Trucks	4	0	0	-	4	1	4	0	-	5	6	7	0	-	13	22
% Single-Unit Trucks	0.5	0.0	-	-	0.4	0.4	1.3	-	-	0.9	2.2	1.0	-	-	1.3	0.9
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	2	0	-	2	2
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.3	-	-	0.2	0.1
Bicycles on Road	5	1	0	-	6	0	0	0	-	0	2	5	0	-	7	13
% Bicycles on Road	0.7	0.4	-	-	0.6	0.0	0.0	-	-	0.0	0.7	0.7	-	-	0.7	0.5
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	4	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	11.8	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	30	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	88.2	-	-	-	-	-	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@pts1.com

Count Name: Westchester Blvd and Columbia
Way
Site Code: 230561
Start Date: 10/24/2023
Page No: 3



Turning Movement Data Plot



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Westchester Blvd and Columbia Way
Site Code: 230561
Start Date: 10/24/2023
Page No: 4

Turning Movement Peak Hour Data (7:45 AM)

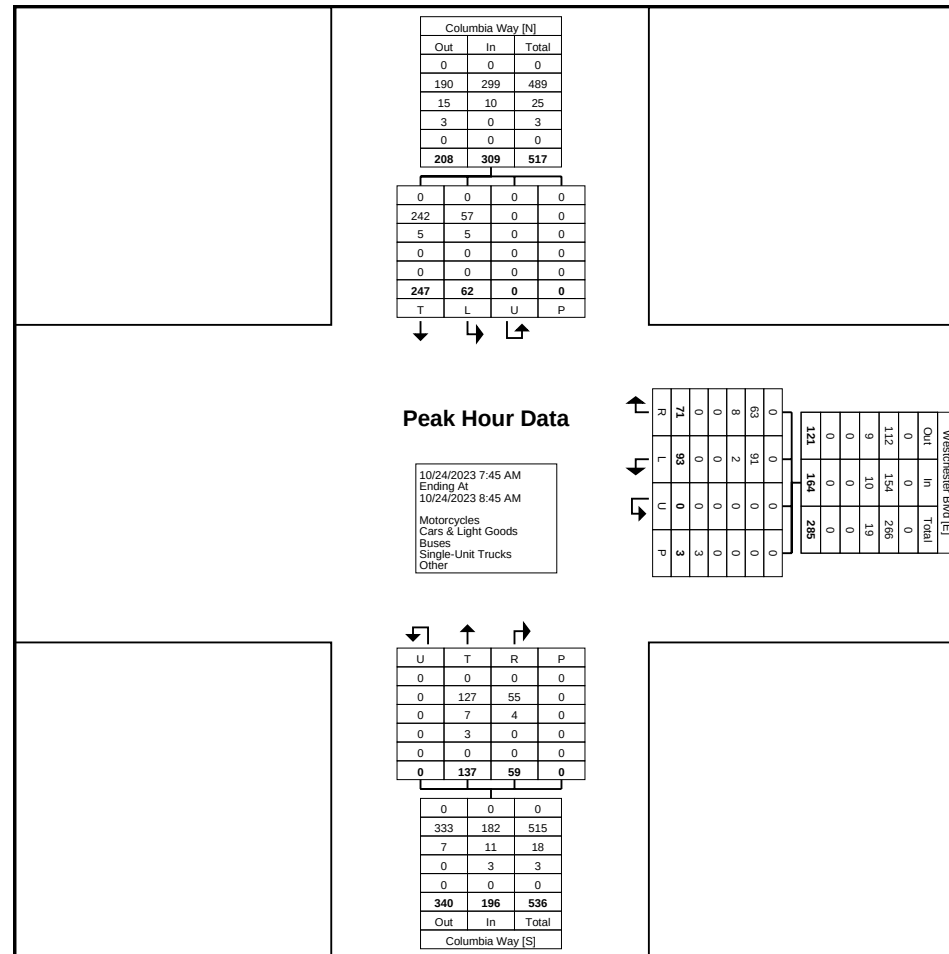
Start Time	Columbia Way Southbound					Westchester Blvd Westbound					Columbia Way Northbound					Int. Total
	Thru	Left	U-Turn	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	Right	Thru	U-Turn	Peds	App. Total	
7:45 AM	53	8	0	0	61	15	19	0	2	34	6	26	0	0	32	127
8:00 AM	111	21	0	0	132	23	40	0	1	63	18	43	0	0	61	256
8:15 AM	52	27	0	0	79	16	25	0	0	41	24	37	0	0	61	181
8:30 AM	31	6	0	0	37	17	9	0	0	26	11	31	0	0	42	105
Total	247	62	0	0	309	71	93	0	3	164	59	137	0	0	196	669
Approach %	79.9	20.1	0.0	-	-	43.3	56.7	0.0	-	-	30.1	69.9	0.0	-	-	-
Total %	36.9	9.3	0.0	-	46.2	10.6	13.9	0.0	-	24.5	8.8	20.5	0.0	-	29.3	-
PHF	0.556	0.574	0.000	-	0.585	0.772	0.581	0.000	-	0.651	0.615	0.797	0.000	-	0.803	0.653
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	242	57	0	-	299	63	91	0	-	154	55	127	0	-	182	635
% Cars & Light Goods	98.0	91.9	-	-	96.8	88.7	97.8	-	-	93.9	93.2	92.7	-	-	92.9	94.9
Buses	5	5	0	-	10	8	2	0	-	10	4	7	0	-	11	31
% Buses	2.0	8.1	-	-	3.2	11.3	2.2	-	-	6.1	6.8	5.1	-	-	5.6	4.6
Single-Unit Trucks	0	0	0	-	0	0	0	0	-	0	0	3	0	-	3	3
% Single-Unit Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	2.2	-	-	1.5	0.4
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	3	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@pts1.com

Count Name: Westchester Blvd and Columbia
Way
Site Code: 230561
Start Date: 10/24/2023
Page No: 5



Turning Movement Peak Hour Data Plot (7:45 AM)



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@pts1.com

Count Name: Westchester Blvd and Columbia Way
Site Code: 230561
Start Date: 10/24/2023
Page No: 6

Turning Movement Peak Hour Data (4:45 PM)

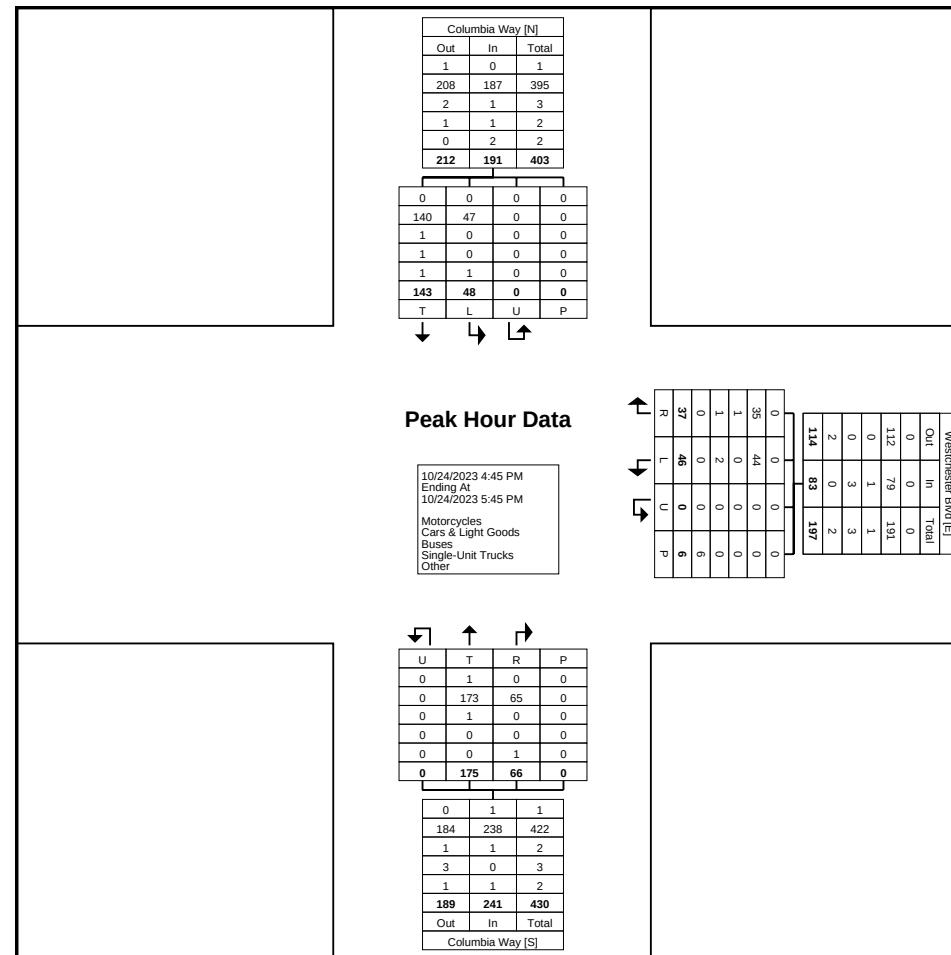
Start Time	Columbia Way Southbound					Westchester Blvd Westbound					Columbia Way Northbound					Int. Total
	Thru	Left	U-Turn	Peds	App. Total	Right	Left	U-Turn	Peds	App. Total	Right	Thru	U-Turn	Peds	App. Total	
4:45 PM	36	9	0	0	45	11	17	0	3	28	14	48	0	0	62	135
5:00 PM	28	7	0	0	35	3	11	0	1	14	18	53	0	0	71	120
5:15 PM	34	14	0	0	48	11	11	0	0	22	16	35	0	0	51	121
5:30 PM	45	18	0	0	63	12	7	0	2	19	18	39	0	0	57	139
Total	143	48	0	0	191	37	46	0	6	83	66	175	0	0	241	515
Approach %	74.9	25.1	0.0	-	-	44.6	55.4	0.0	-	-	27.4	72.6	0.0	-	-	-
Total %	27.8	9.3	0.0	-	37.1	7.2	8.9	0.0	-	16.1	12.8	34.0	0.0	-	46.8	-
PHF	0.794	0.667	0.000	-	0.758	0.771	0.676	0.000	-	0.741	0.917	0.825	0.000	-	0.849	0.926
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	1	0	-	1	1
% Motorcycles	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.6	-	-	0.4	0.2
Cars & Light Goods	140	47	0	-	187	35	44	0	-	79	65	173	0	-	238	504
% Cars & Light Goods	97.9	97.9	-	-	97.9	94.6	95.7	-	-	95.2	98.5	98.9	-	-	98.8	97.9
Buses	1	0	0	-	1	1	0	0	-	1	0	1	0	-	1	3
% Buses	0.7	0.0	-	-	0.5	2.7	0.0	-	-	1.2	0.0	0.6	-	-	0.4	0.6
Single-Unit Trucks	1	0	0	-	1	1	2	0	-	3	0	0	0	-	0	4
% Single-Unit Trucks	0.7	0.0	-	-	0.5	2.7	4.3	-	-	3.6	0.0	0.0	-	-	0.0	0.8
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	1	1	0	-	2	0	0	0	-	0	1	0	0	-	1	3
% Bicycles on Road	0.7	2.1	-	-	1.0	0.0	0.0	-	-	0.0	1.5	0.0	-	-	0.4	0.6
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	2	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	33.3	-	-	-	-	-	-	-
Pedestrians	-	-	-	0	-	-	-	-	4	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	66.7	-	-	-	-	-	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@pts1.com

Count Name: Westchester Blvd and Columbia
Way
Site Code: 230561
Start Date: 10/24/2023
Page No: 7



Turning Movement Peak Hour Data Plot (4:45 PM)



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@pts1.com

Count Name: Columbia Way & Forest Gate
Avenue
Site Code: 230561
Start Date: 01/31/2024
Page No: 1

Turning Movement Data

Start Time	Columbia Way Eastbound					Columbia Way Westbound					Forest Gate Avenue Northbound					Int. Total
	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Left	Right	U-Turn	Peds	App. Total	
6:00 AM	12	1	0	0	13	1	3	0	0	4	6	13	0	0	19	36
6:15 AM	17	2	0	0	19	1	0	0	0	1	6	21	0	0	27	47
6:30 AM	20	0	0	0	20	0	1	0	0	1	5	17	0	0	22	43
6:45 AM	15	1	0	0	16	0	2	0	0	2	9	20	0	0	29	47
Hourly Total	64	4	0	0	68	2	6	0	0	8	26	71	0	0	97	173
7:00 AM	17	0	0	0	17	2	4	0	0	6	9	30	0	0	39	62
7:15 AM	35	2	0	0	37	0	2	0	0	2	22	24	0	0	46	85
7:30 AM	22	2	0	0	24	3	7	0	0	10	10	27	0	0	37	71
7:45 AM	23	3	0	0	26	8	19	0	0	27	23	22	0	0	45	98
Hourly Total	97	7	0	0	104	13	32	0	0	45	64	103	0	0	167	316
8:00 AM	30	7	0	0	37	3	29	0	0	32	20	23	0	0	43	112
8:15 AM	30	15	0	0	45	7	8	0	0	15	26	19	0	0	45	105
8:30 AM	25	8	0	0	33	5	5	0	0	10	9	19	0	0	28	71
8:45 AM	22	8	0	0	30	4	5	1	0	10	6	18	0	0	24	64
Hourly Total	107	38	0	0	145	19	47	1	0	67	61	79	0	0	140	352
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	10	17	0	0	27	13	21	0	0	34	10	10	0	0	20	81
4:15 PM	8	23	0	0	31	20	17	0	0	37	10	3	0	0	13	81
4:30 PM	7	21	0	0	28	10	20	0	0	30	9	9	0	0	18	76
4:45 PM	19	16	0	0	35	25	13	0	0	38	10	8	0	0	18	91
Hourly Total	44	77	0	0	121	68	71	0	0	139	39	30	0	0	69	329
5:00 PM	10	26	0	0	36	28	24	0	0	52	12	5	0	0	17	105
5:15 PM	9	13	0	0	22	22	19	0	0	41	12	10	0	0	22	85
5:30 PM	13	24	0	0	37	15	25	0	0	40	7	5	0	0	12	89
5:45 PM	7	15	0	0	22	16	23	0	0	39	13	7	0	0	20	81
Hourly Total	39	78	0	0	117	81	91	0	0	172	44	27	0	0	71	360
6:00 PM	8	14	1	0	23	24	20	0	0	44	11	8	0	0	19	86
6:15 PM	10	14	0	0	24	18	11	0	0	29	16	2	0	0	18	71
6:30 PM	3	20	0	0	23	11	16	0	0	27	12	7	0	0	19	69
6:45 PM	10	12	0	0	22	9	16	0	0	25	6	10	0	0	16	63
Hourly Total	31	60	1	0	92	62	63	0	0	125	45	27	0	0	72	289
Grand Total	382	264	1	0	647	245	310	1	0	556	279	337	0	0	616	1819
Approach %	59.0	40.8	0.2	-	-	44.1	55.8	0.2	-	-	45.3	54.7	0.0	-	-	-
Total %	21.0	14.5	0.1	-	35.6	13.5	17.0	0.1	-	30.6	15.3	18.5	0.0	-	33.9	-
Motorcycles	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0

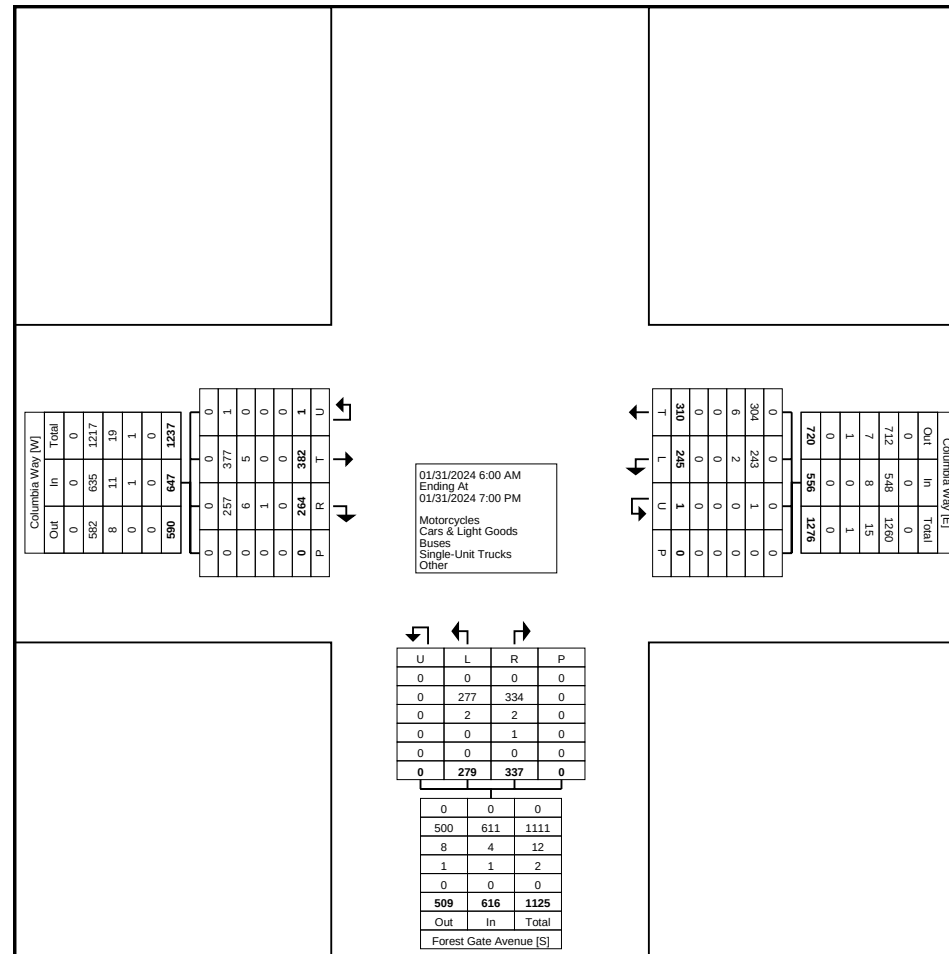
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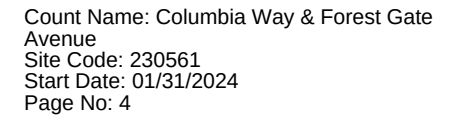
Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Columbia Way & Forest Gate
Avenue
Site Code: 230561
Start Date: 01/31/2024
Page No: 3



Turning Movement Data Plot

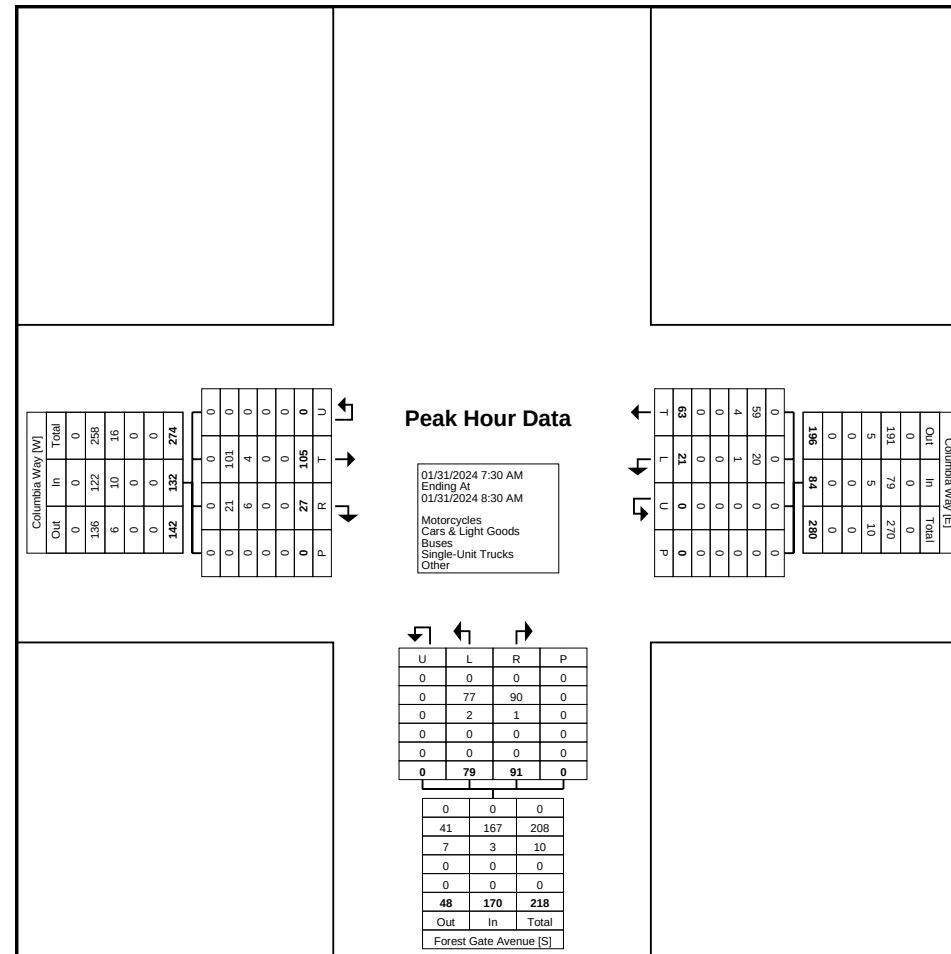
[illegible]



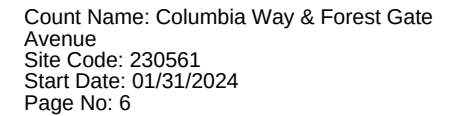
Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@pts1.com

Count Name: Columbia Way & Forest Gate
Avenue
Site Code: 230561
Start Date: 01/31/2024
Page No: 5



Turning Movement Peak Hour Data Plot (7:30 AM)

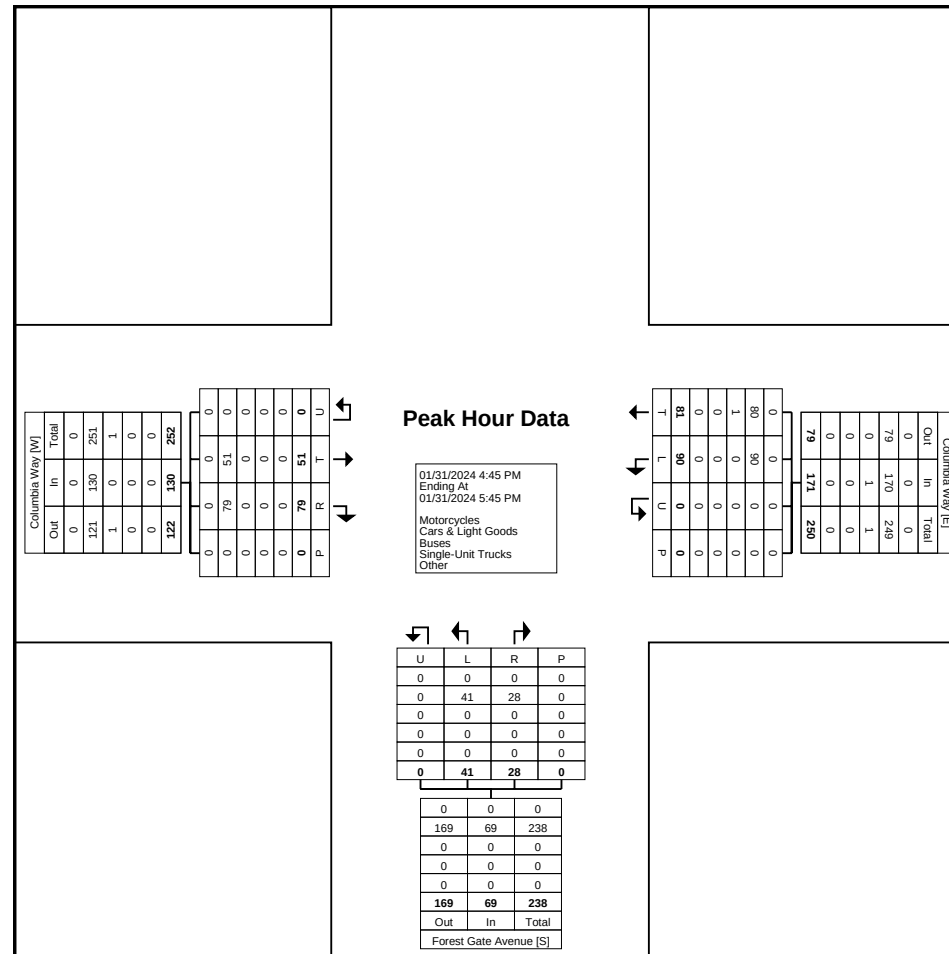
[illegible]



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@pts1.com

Count Name: Columbia Way & Forest Gate
Avenue
Site Code: 230561
Start Date: 01/31/2024
Page No: 7



Turning Movement Peak Hour Data Plot (4:45 PM)



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

Cambridge, Ontario, Canada N1R 8J8
519-896-3163 cbowness@ptsl.com

Count Name: Mount Hope Road & Columbia
Way
Site Code: 230561
Start Date: 01/31/2024
Page No: 1

Turning Movement Data

Start Time	Columbia Way Eastbound						Columbia Way Westbound						Mount Hope Road Northbound						Mount Hope Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
6:00 AM	3	7	0	0	0	10	0	9	0	0	0	9	3	0	2	0	0	5	3	0	0	0	0	3	27
6:15 AM	3	16	1	0	0	20	0	5	0	0	0	5	3	0	3	0	0	6	0	0	0	0	0	0	31
6:30 AM	2	15	0	0	0	17	0	6	1	0	0	7	1	0	4	0	0	5	1	0	2	0	0	3	32
6:45 AM	2	10	0	0	0	12	0	9	2	0	0	11	1	0	4	0	1	5	2	0	3	0	0	5	33
Hourly Total	10	48	1	0	0	59	0	29	3	0	0	32	8	0	13	0	1	21	6	0	5	0	0	11	123
7:00 AM	1	12	3	0	0	16	0	13	0	0	0	13	3	0	4	0	2	7	1	0	2	0	0	3	39
7:15 AM	4	28	0	0	0	32	1	23	0	0	0	24	2	0	9	0	0	11	2	0	3	0	0	5	72
7:30 AM	2	21	2	0	0	25	0	15	2	0	0	17	2	3	1	0	1	6	0	2	8	0	0	10	58
7:45 AM	5	20	0	0	0	25	0	40	2	0	0	42	7	2	3	0	0	12	4	0	9	0	0	13	92
Hourly Total	12	81	5	0	0	98	1	91	4	0	0	96	14	5	17	0	3	36	7	2	22	0	0	31	261
8:00 AM	1	31	7	0	0	39	0	49	0	0	0	49	14	2	5	0	1	21	3	2	20	0	0	25	134
8:15 AM	4	34	3	0	0	41	1	30	3	0	0	34	12	1	4	0	0	17	4	1	16	0	0	21	113
8:30 AM	4	27	2	0	0	33	0	14	1	0	0	15	5	1	3	0	1	9	4	0	5	0	0	9	66
8:45 AM	6	23	5	0	0	34	0	9	1	0	0	10	5	2	3	0	1	10	4	1	7	0	0	12	66
Hourly Total	15	115	17	0	0	147	1	102	5	0	0	108	36	6	15	0	3	57	15	4	48	0	0	67	379
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	6	24	8	0	0	38	7	20	3	0	0	30	1	0	2	0	0	3	1	2	1	0	0	4	75
4:15 PM	4	27	4	0	0	35	4	24	1	0	0	29	3	1	1	0	1	5	3	1	7	0	0	11	80
4:30 PM	9	25	4	0	0	38	4	18	6	0	0	28	3	1	1	0	0	5	3	3	4	0	0	10	81
4:45 PM	8	28	4	0	0	40	1	21	2	0	0	24	3	1	2	0	2	6	3	1	5	0	0	9	79
Hourly Total	27	104	20	0	0	151	16	83	12	0	0	111	10	3	6	0	3	19	10	7	17	0	0	34	315
5:00 PM	5	28	11	0	0	44	2	25	5	1	0	33	3	1	3	0	3	7	4	1	8	0	0	13	97
5:15 PM	7	23	7	1	0	38	6	22	6	0	0	34	4	2	0	0	1	6	2	3	8	0	0	13	91
5:30 PM	7	31	9	0	0	47	3	22	5	0	0	30	4	0	2	0	1	6	1	0	7	0	0	8	91
5:45 PM	4	21	4	0	0	29	4	29	5	0	0	38	1	1	1	0	1	3	0	2	7	0	0	9	79
Hourly Total	23	103	31	1	0	158	15	98	21	1	0	135	12	4	6	0	6	22	7	6	30	0	0	43	358
6:00 PM	4	18	6	0	0	28	4	25	3	0	0	32	5	2	1	0	1	8	3	1	3	0	0	7	75
6:15 PM	6	21	7	0	0	34	3	22	2	0	0	27	3	1	1	0	3	5	2	1	3	0	0	6	72
6:30 PM	4	20	4	0	0	28	1	25	2	0	0	28	5	1	1	0	2	7	3	0	5	0	0	8	71
6:45 PM	4	18	4	0	0	26	2	17	2	0	0	21	4	1	1	0	2	6	2	1	14	0	0	17	70
Hourly Total	18	77	21	0	0	116	10	89	9	0	0	108	17	5	4	0	8	26	10	3	25	0	0	38	288
Grand Total	105	528	95	1	0	729	43	492	54	1	0	590	97	23	61	0	24	181	55	22	147	0	0	224	1724
Approach %	14.4	72.4	13.0	0.1	-	-	7.3	83.4	9.2	0.2	-	-	53.6	12.7	33.7	0.0	-	-	24.6	9.8	65.6	0.0	-	-	-
Total %	6.1	30.6	5.5	0.1	-	42.3	2.5	28.5	3.1	0.1	-	34.2	5.6	1.3	3.5	0.0	-	10.5	3.2	1.3	8.5	0.0	-	13.0	-
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0

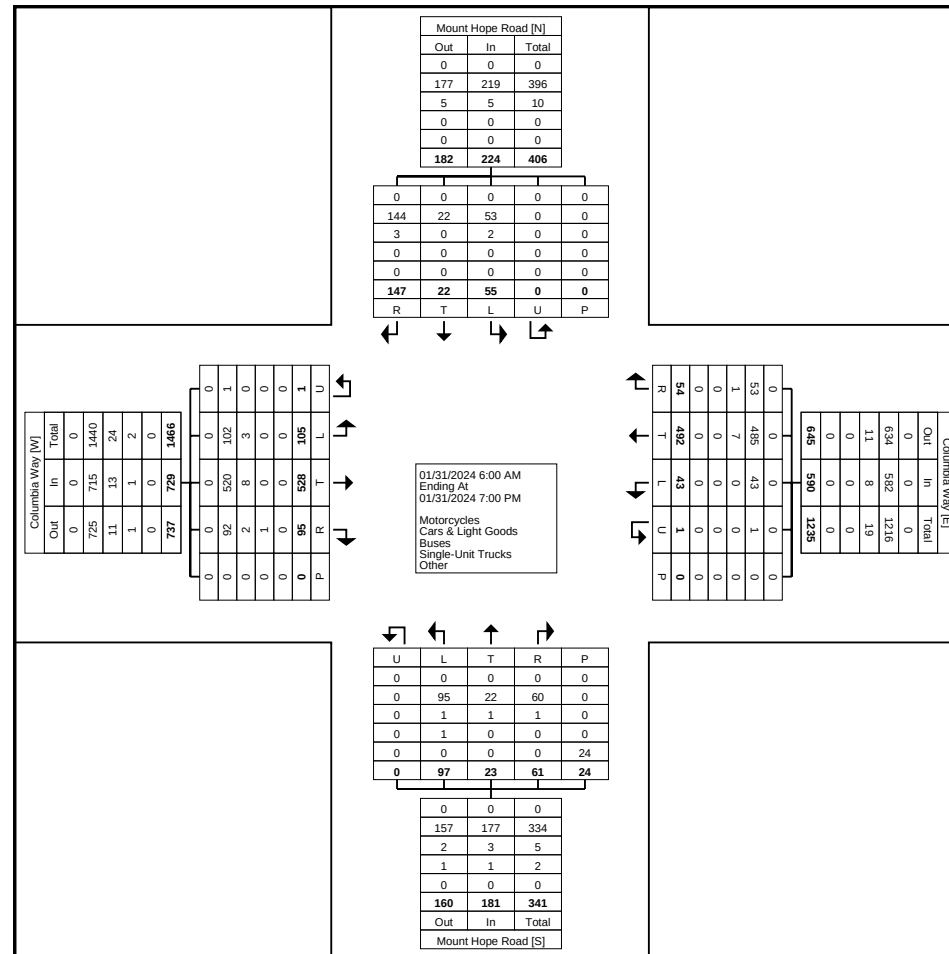
% Motorcycles	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	102	520	92	1	-	715	43	485	53	1	-	582	95	22	60	0	-	177	53	22	144	0	-	219	1693
% Cars & Light Goods	97.1	98.5	96.8	100.0	-	98.1	100.0	98.6	98.1	100.0	-	98.6	97.9	95.7	98.4	-	-	97.8	96.4	100.0	98.0	-	-	97.8	98.2
Buses	3	8	2	0	-	13	0	7	1	0	-	8	1	1	1	0	-	3	2	0	3	0	-	5	29
% Buses	2.9	1.5	2.1	0.0	-	1.8	0.0	1.4	1.9	0.0	-	1.4	1.0	4.3	1.6	-	-	1.7	3.6	0.0	2.0	-	-	2.2	1.7
Single-Unit Trucks	0	0	1	0	-	1	0	0	0	0	-	0	1	0	0	0	-	1	0	0	0	0	-	0	2
% Single-Unit Trucks	0.0	0.0	1.1	0.0	-	0.1	0.0	0.0	0.0	0.0	-	0.0	1.0	0.0	0.0	-	-	0.6	0.0	0.0	0.0	-	-	0.0	0.1
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	24	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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Count Name: Mount Hope Road & Columbia
Way
Site Code: 230561
Start Date: 01/31/2024
Page No: 3



Turning Movement Data Plot



Paradigm Transportation Solutions Limited
5A-150 Pinebush Rd

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Count Name: Mount Hope Road & Columbia
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Page No: 4

Turning Movement Peak Hour Data (7:45 AM)

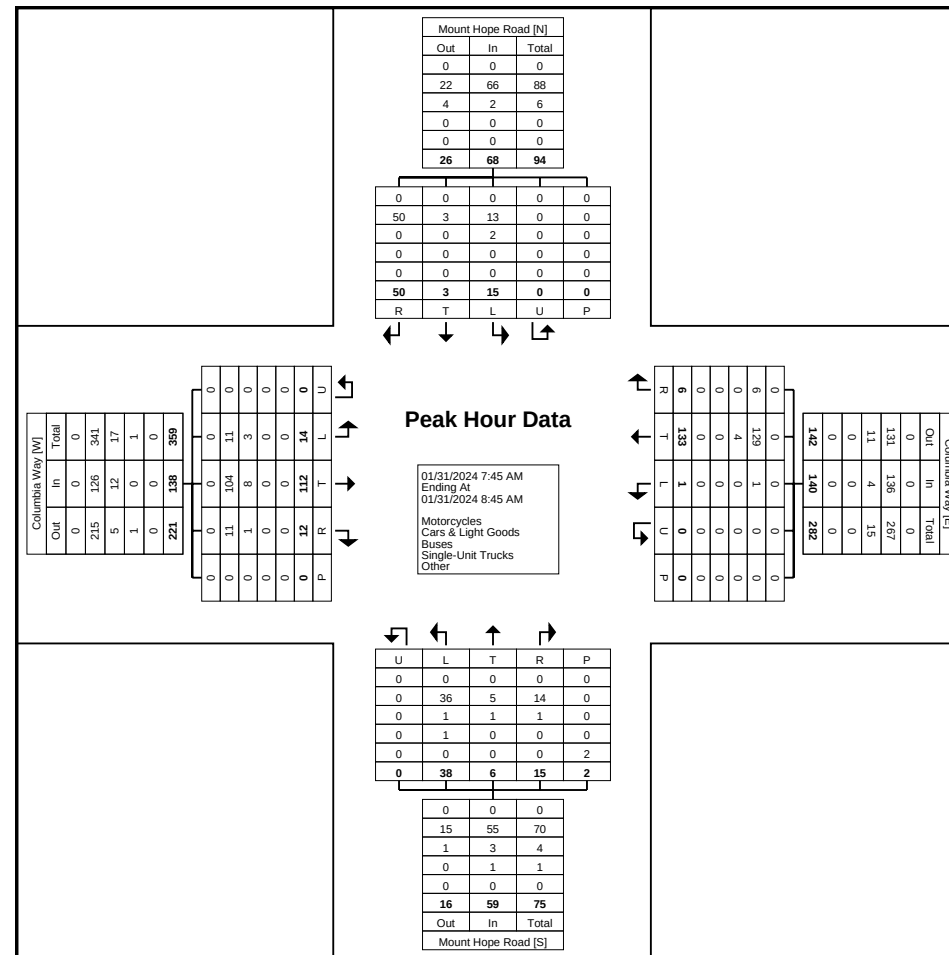
Start Time	Columbia Way Eastbound						Columbia Way Westbound						Mount Hope Road Northbound						Mount Hope Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:45 AM	5	20	0	0	0	25	0	40	2	0	0	42	7	2	3	0	0	12	4	0	9	0	0	13	92
8:00 AM	1	31	7	0	0	39	0	49	0	0	0	49	14	2	5	0	1	21	3	2	20	0	0	25	134
8:15 AM	4	34	3	0	0	41	1	30	3	0	0	34	12	1	4	0	0	17	4	1	16	0	0	21	113
8:30 AM	4	27	2	0	0	33	0	14	1	0	0	15	5	1	3	0	1	9	4	0	5	0	0	9	66
Total	14	112	12	0	0	138	1	133	6	0	0	140	38	6	15	0	2	59	15	3	50	0	0	68	405
Approach %	10.1	81.2	8.7	0.0	-	-	0.7	95.0	4.3	0.0	-	-	64.4	10.2	25.4	0.0	-	-	22.1	4.4	73.5	0.0	-	-	-
Total %	3.5	27.7	3.0	0.0	-	34.1	0.2	32.8	1.5	0.0	-	34.6	9.4	1.5	3.7	0.0	-	14.6	3.7	0.7	12.3	0.0	-	16.8	-
PHF	0.700	0.824	0.429	0.000	-	0.841	0.250	0.679	0.500	0.000	-	0.714	0.679	0.750	0.750	0.000	-	0.702	0.938	0.375	0.625	0.000	-	0.680	0.756
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	11	104	11	0	-	126	1	129	6	0	-	136	36	5	14	0	-	55	13	3	50	0	-	66	383
% Cars & Light Goods	78.6	92.9	91.7	-	-	91.3	100.0	97.0	100.0	-	-	97.1	94.7	83.3	93.3	-	-	93.2	86.7	100.0	100.0	-	-	97.1	94.6
Buses	3	8	1	0	-	12	0	4	0	0	-	4	1	1	1	0	-	3	2	0	0	0	-	2	21
% Buses	21.4	7.1	8.3	-	-	8.7	0.0	3.0	0.0	-	-	2.9	2.6	16.7	6.7	-	-	5.1	13.3	0.0	0.0	-	-	2.9	5.2
Single-Unit Trucks	0	0	0	0	-	0	0	0	0	0	-	0	1	0	0	0	-	1	0	0	0	0	-	0	1
% Single-Unit Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	2.6	0.0	0.0	-	-	1.7	0.0	0.0	0.0	-	-	0.0	0.2
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	2	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-



Paradigm Transportation Solutions Limited
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Count Name: Mount Hope Road & Columbia
Way
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Start Date: 01/31/2024
Page No: 5



Turning Movement Peak Hour Data Plot (7:45 AM)



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Count Name: Mount Hope Road & Columbia
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Start Date: 01/31/2024
Page No: 6

Turning Movement Peak Hour Data (4:45 PM)

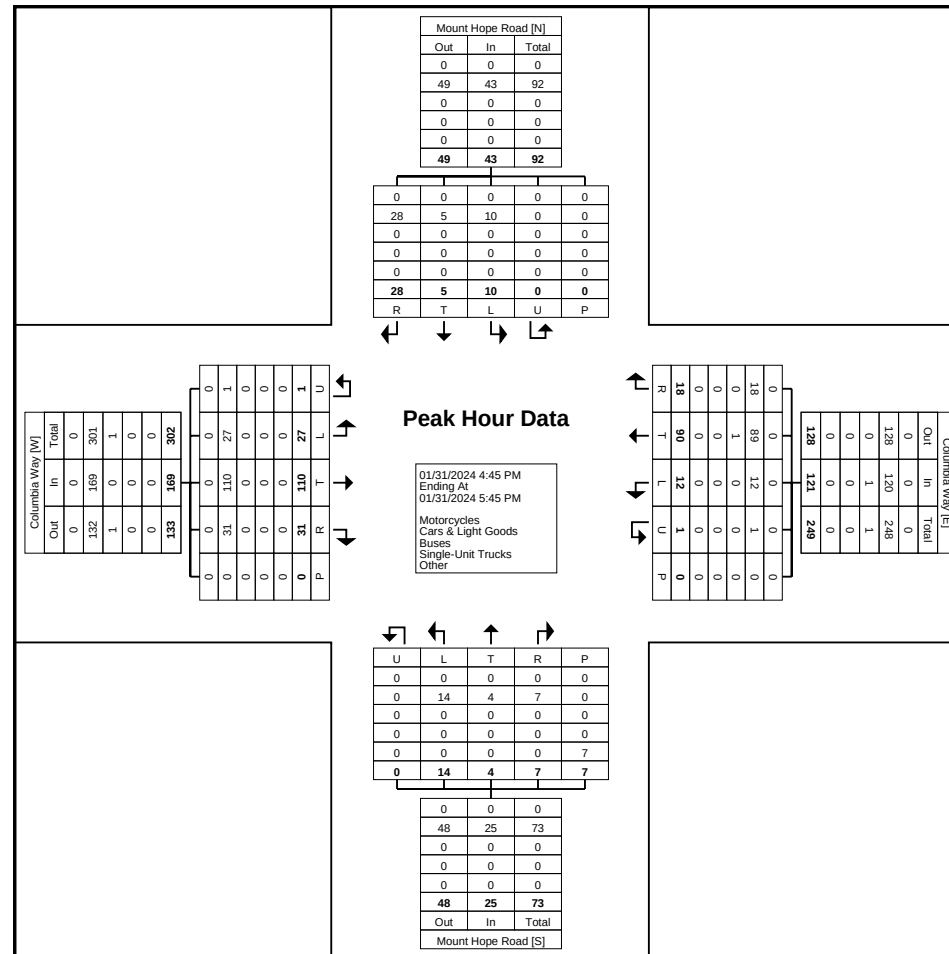
Start Time	Columbia Way Eastbound						Columbia Way Westbound						Mount Hope Road Northbound						Mount Hope Road Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:45 PM	8	28	4	0	0	40	1	21	2	0	0	24	3	1	2	0	2	6	3	1	5	0	0	9	79
5:00 PM	5	28	11	0	0	44	2	25	5	1	0	33	3	1	3	0	3	7	4	1	8	0	0	13	97
5:15 PM	7	23	7	1	0	38	6	22	6	0	0	34	4	2	0	0	1	6	2	3	8	0	0	13	91
5:30 PM	7	31	9	0	0	47	3	22	5	0	0	30	4	0	2	0	1	6	1	0	7	0	0	8	91
Total	27	110	31	1	0	169	12	90	18	1	0	121	14	4	7	0	7	25	10	5	28	0	0	43	358
Approach %	16.0	65.1	18.3	0.6	-	-	9.9	74.4	14.9	0.8	-	-	56.0	16.0	28.0	0.0	-	-	23.3	11.6	65.1	0.0	-	-	-
Total %	7.5	30.7	8.7	0.3	-	47.2	3.4	25.1	5.0	0.3	-	33.8	3.9	1.1	2.0	0.0	-	7.0	2.8	1.4	7.8	0.0	-	12.0	-
PHF	0.844	0.887	0.705	0.250	-	0.899	0.500	0.900	0.750	0.250	-	0.890	0.875	0.500	0.583	0.000	-	0.893	0.625	0.417	0.875	0.000	-	0.827	0.923
Motorcycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Motorcycles	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Cars & Light Goods	27	110	31	1	-	169	12	89	18	1	-	120	14	4	7	0	-	25	10	5	28	0	-	43	357
% Cars & Light Goods	100.0	100.0	100.0	100.0	-	100.0	100.0	98.9	100.0	100.0	-	99.2	100.0	100.0	100.0	-	-	100.0	100.0	100.0	100.0	-	-	100.0	99.7
Buses	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	1
% Buses	0.0	0.0	0.0	0.0	-	0.0	0.0	1.1	0.0	0.0	-	0.8	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.3
Single-Unit Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Single-Unit Trucks	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	7	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-



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Count Name: Mount Hope Road & Columbia
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Start Date: 01/31/2024
Page No: 7



Turning Movement Peak Hour Data Plot (4:45 PM)

Appendix C

Signal Timings



REGIONAL MUNICIPALITY OF PEEL

Traffic Signal Timing Parameters

Database Date	Feburary 12, 2024		Prepared Date	Feburary 14, 2024
Database Rev	iNET		Completed By	S.A.
Timing Card / Field rev	-		Checked By	A.P.

Location	Columbia Way and Kingsview Drive								
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Phase #	Street Name - Direction	Vehicle Minimum (s)	Pedestrian Minimum (s)		Amber (s)	All Red (s)	TIME PERIOD (s) (Green+Amber+All Red)		
			WALK	FDWALK			AM SPLITS	OFF MAX	PM MAX
1	Not in Used	-	-	-	-	-	-	-	-
2	Columbia Way - EB	8	8	7	4	2	70	36	36
3	Not in Used	-	-	-	-	-	-	-	-
4	Kingsview Drive - NB	8	8	7	4	2.9	30	32	32
5	Not in Used	-	-	-	-	-	-	-	-
6	Columbia Way - WB	8	8	7	4	2	70	36	36
7	Not in Used	-	-	-	-	-	-	-	-
8	Computer Phase	8	8	7	4	2.9	30	32	32

System Control Yes Semi-Actuated Mode Yes	TIME (M-F)	PEAK	CYCLE LENGTH (s)	OFFSET (s)
	6:00 - 9:00	AM	100	0
	9:00 - 15:00	OFF	Free	0
	15:00 - 00:00	PM	Free	0

REGIONAL MUNICIPALITY OF PEEL

Traffic Signal Timing Parameters

Database Date	October 4, 2023		Prepared Date	October 10, 2023
Database Rev	iNET		Completed By	SA
Timing Card / Field rev	-		Checked By	MH

Location	Highway 50 and Columbia Way								
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Phase #	Street Name - Direction	Vehicle Minimum (s)	Pedestrian Minimum (s)		Amber (s)	All Red (s)	TIME PERIOD (s) (Green+Amber+All Red)		
			WALK	FDWALK			AM SPLITS	OFF SPLITS	PM SPLITS
1	Not in Use	-	-	-	-	-	-	-	-
2	Highway 50 - NB/SB	20	8	16	4	2.7	65	39	64
3	Not in Use	-	-	-	-	-	-	-	-
4	Columbia Way - WB/EB	8	8	11	4	2	45	36	36
5	Not in Use	-	-	-	-	-	-	-	-
6	Not in Use	-	-	-	-	-	-	-	-
7	Not in Use	-	-	-	-	-	-	-	-
8	Not in Use	-	-	-	-	-	-	-	-

System Control Yes Semi-Actuated Mode Yes	TIME (M-F)		PEAK	CYCLE LENGTH (s)	OFFSET (s)
	6:00 - 9:00		AM	110	0
	9:00 - 15:00		OFF	75	0
	15:00 - 19:00		PM	100	15

Appendix D

Synchro Reports – Existing Operations



Lanes, Volumes, Timings
1: Hwy 50 [Peel Regional Road 50] & Columbia Way
(230561) 9408 Columbia
Base PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	1	93	0	60	1	516	151	100	326	2
Future Volume (vph)	2	0	1	93	0	60	1	516	151	100	326	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0			0.0	60.0		0.0	136.0		300.0	85.0	25.0
Storage Lanes	0			0	1		0	1		0	1	1
Taper Length (m)	7.5			60.0				45.0		90.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					0.98							
Frt		0.955			0.850				0.850			0.850
Fit Protected		0.968		0.950			0.950			0.950		
Satd. Flow (prot)	0	1756	0	1787	1535	0	902	1863	1599	1770	1845	808
Fit Permitted		0.837		0.756			0.555			0.440		
Satd. Flow (perm)	0	1519	0	1422	1535	0	527	1863	1599	820	1845	808
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		40			319				159			33
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		56.6			246.0			735.7			477.2	
Travel Time (s)		4.1			17.7			53.0			34.4	
Confl. Bikes (#/hr)	1					1						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	1%	0%	3%	100%	2%	1%	2%	3%	100%
Adj. Flow (vph)	2	0	1	98	0	63	1	543	159	105	343	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	3	0	98	63	0	1	543	159	105	343	2
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2		2	2		2
Detector Phase	4	4		4	4		2	2	2	2	2	2
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		20.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	25.0	25.0		25.0	25.0		30.7	30.7	30.7	30.7	30.7	30.7
Total Split (s)	36.0	36.0		36.0	36.0		64.0	64.0	64.0	64.0	64.0	64.0
Total Split (%)	36.0%	36.0%		36.0%	36.0%		64.0%	64.0%	64.0%	64.0%	64.0%	64.0%
Maximum Green (s)	30.0	30.0		30.0	30.0		57.3	57.3	57.3	57.3	57.3	57.3
Yellow Time (s)	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		2.7	2.7	2.7	2.7	2.7	2.7
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0		6.0	6.0		6.7	6.7	6.7	6.7	6.7	6.7
Lead/Lag												
Lead-Lag Optimize?												

Paradigm Transportation Solutions Limited

Synchro 11 Report
Page 1

Lanes, Volumes, Timings
1: Hwy 50 [Peel Regional Road 50] & Columbia Way
(230561) 9408 Columbia
Base PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	8.0	8.0		8.0	8.0		8.0	8.0	8.0	8.0	8.0	8.0
Flash Don't Walk (s)	11.0	11.0		11.0	11.0		16.0	16.0	16.0	16.0	16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	12.5	12.5		12.5	12.5		79.0	79.0	79.0	79.0	79.0	79.0
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.79	0.79	0.79	0.79	0.79	0.79
v/c Ratio	0.01	0.55		0.13	0.13		0.00	0.37	0.12	0.16	0.24	0.00
Control Delay (s/veh)	0.0	52.3		0.6	0.6		4.0	5.4	1.0	4.9	4.5	0.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	0.0	52.3		0.6	0.6		4.0	5.4	1.0	4.9	4.5	0.0
LOS	A	D		A	A		A	A	A	A	A	A
Approach Delay (s/veh)				32.1			4.4				4.6	
Approach LOS				C			A				A	
Queue Length 50th (m)	0.0			19.1	0.0		0.1	32.3	0.0	5.1	17.7	0.0
Queue Length 95th (m)	0.0			34.1	0.0		0.6	60.1	5.5	12.9	34.3	0.0
Internal Link Dist (m)		32.6			222.0			711.7			453.2	
Turn Bay Length (m)				60.0			136.0		300.0	85.0		25.0
Base Capacity (vph)	483			426	683		416	1471	1296	647	1457	645
Starvation Cap Reductn	0			0	0		0	0	0	0	0	0
Spillback Cap Reductn	0			0	0		0	0	0	0	0	0
Storage Cap Reductn	0			0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.23		0.09			0.00	0.37	0.12	0.16	0.24	0.00

Intersection Summary												
Area Type:	Other											
Cycle Length: 100												
Actuated Cycle Length: 100												
Offset: 15 (15%), Referenced to phase 2:NBSB and 6:, Start of Green												
Natural Cycle: 60												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.55												
Intersection Signal Delay (s/veh): 7.8	Intersection LOS: A											
Intersection Capacity Utilization 67.0%	ICU Level of Service C											
Analysis Period (min) 15												

Splits and Phases: 1: Hwy 50 [Peel Regional Road 50] & Columbia Way



Paradigm Transportation Solutions Limited

Synchro 11 Report
Page 2

HCM Signalized Intersection Capacity Analysis
1: Hwy 50 [Peel Regional Road 50] & Columbia Way

(230561) 9408 Columbia
Base PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	1	93	0	60	1	516	151	100	326	2
Future Volume (vph)	2	0	1	93	0	60	1	516	151	100	326	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0			6.7	6.7	6.7	6.7	6.7
Lane Util. Factor	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00		1.00	0.98		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.96		1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85	0.85
Flt Protected	0.97		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1756		1787	1531		903	1863	1599	1770	1845	808	808
Flt Permitted	0.84		0.76	1.00		0.55	1.00	1.00	0.44	1.00	1.00	1.00
Satd. Flow (perm)	1519		1422	1531		527	1863	1599	820	1845	808	808
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2	0	1	98	0	63	1	543	159	105	343	2
RTOR Reduction (vph)	0	3	0	0	56	0	0	0	38	0	0	0
Lane Group Flow (vph)	0	0	0	98	7	0	1	543	121	105	343	2
Confl. Bikes (#/hr)	1					1						
Heavy Vehicles (%)	0%	0%	0%	1%	0%	3%	100%	2%	1%	2%	3%	100%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			4			2		2		2
Permitted Phases	4			4			2		2	2		2
Actuated Green, G (s)	10.9			10.9	10.9		76.4	76.4	76.4	76.4	76.4	76.4
Effective Green, g (s)	10.9			10.9	10.9		76.4	76.4	76.4	76.4	76.4	76.4
Actuated g/C Ratio	0.11			0.11	0.11		0.76	0.76	0.76	0.76	0.76	0.76
Clearance Time (s)	6.0			6.0	6.0		6.7	6.7	6.7	6.7	6.7	6.7
Vehicle Extension (s)	3.0			3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	165			154	166		402	1423	1221	626	1409	617
v/s Ratio Prot					0.00			c0.29			0.19	
v/s Ratio Perm	0.00			c0.07			0.00		0.08	0.13		0.00
v/c Ratio	0.00			0.64	0.04		0.00	0.38	0.10	0.17	0.24	0.00
Uniform Delay, d1	39.7			42.7	39.9		2.8	3.9	3.0	3.2	3.4	2.8
Progression Factor	1.00			1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0			8.3	0.1		0.0	0.8	0.2	0.6	0.4	0.0
Delay (s)	39.7			51.0	40.0		2.8	4.7	3.2	3.8	3.8	2.8
Level of Service	D			D			A	A	A	A	A	A
Approach Delay (s/veh)	39.7				46.7			4.4			3.8	
Approach LOS	D				D			A			A	
Intersection Summary												
HCM 2000 Control Delay (s/veh)		9.4										
HCM 2000 Volume to Capacity ratio		0.41										
Actuated Cycle Length (s)		100.0							12.7			
Intersection Capacity Utilization		67.0%										
Analysis Period (min)		15										
c Critical Lane Group												

Lanes, Volumes, Timings
2: Kingsview Drive & Columbia Way

(230561) 9408 Columbia
Base PM

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	194	81	60	132	28	40
Future Volume (vph)	194	81	60	132	28	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99			1.00		
Frt	0.960				0.920	
Flt Protected				0.985	0.980	
Satd. Flow (prot)	1777	0	0	1835	1713	0
Flt Permitted				0.836	0.980	
Satd. Flow (perm)	1777	0	0	1551	1713	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	36				43	
Link Speed (k/h)	50			50	50	
Link Distance (m)	246.0			351.6	165.2	
Travel Time (s)	17.7			25.3	11.9	
Confl. Peds. (#/hr)		8		8		
Confl. Bikes (#/hr)		2		2		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	0%	2%	2%	0%	0%
Adj. Flow (vph)	206	86	64	140	30	43
Shared Lane Traffic (%)						
Lane Group Flow (vph)	292	0	0	204	73	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15		25	25	15
Turn Type	NA		Perm	NA	Prot	
Protected Phases		2			6	8
Permitted Phases				6		
Detector Phase		2		6	6	8
Switch Phase						
Minimum Initial (s)	8.0			8.0	8.0	
Minimum Split (s)	36.0			32.0	32.0	36.0
Total Split (s)	36.0			32.0	32.0	36.0
Total Split (%)	50.0%			44.4%	44.4%	50.0%
Maximum Green (s)	30.0			25.1	25.1	30.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.9	2.9	2.0
Lost Time Adjust (s)	0.0				0.0	0.0
Total Lost Time (s)	6.0				6.9	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	C-Max	None

Lanes, Volumes, Timings
2: Kingsview Drive & Columbia Way

(230561) 9408 Columbia
Base PM

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Walk Time (s)	8.0		8.0	8.0	8.0	
Flash Don't Walk (s)	7.0		7.0	7.0	7.0	
Pedestrian Calls (#/hr)	0		0	0	0	
Act Effct Green (s)	55.6		54.9	8.4		
Actuated g/C Ratio	0.77		0.76	0.12		
v/c Ratio	0.21		0.17	0.31		
Control Delay (s/veh)	3.3		3.9	18.9		
Queue Delay	0.0		0.0	0.0		
Total Delay (s/veh)	3.3		3.9	18.9		
LOS	A		A	B		
Approach Delay (s/veh)	3.3		3.9	18.9		
Approach LOS	A		A	B		
Queue Length 50th (m)	9.3		7.8	4.0		
Queue Length 95th (m)	18.7		16.0	14.9		
Internal Link Dist (m)	222.0		327.6	141.2		
Turn Bay Length (m)						
Base Capacity (vph)	1380		1182	738		
Starvation Cap Reductn	0		0	0		
Spillback Cap Reductn	0		0	0		
Storage Cap Reductn	0		0	0		
Reduced v/c Ratio	0.21		0.17	0.10		

Intersection Summary

Area Type: Other
Cycle Length: 72
Actuated Cycle Length: 72
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.31
Intersection Signal Delay (s/veh): 5.5
Intersection LOS: A
Intersection Capacity Utilization 48.1%
ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 2: Kingsview Drive & Columbia Way



HCM Signalized Intersection Capacity Analysis
2: Kingsview Drive & Columbia Way

(230561) 9408 Columbia
Base PM

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩			↩	↩	↩
Traffic Volume (vph)	194	81	60	132	28	40
Future Volume (vph)	194	81	60	132	28	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.9	6.0	
Lane Util. Factor	1.00			1.00	1.00	
Frpb, ped/bikes	0.99			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.96			1.00	0.92	
Flt Protected	1.00			0.98	0.98	
Satd. Flow (prot)	1778			1827	1714	
Flt Permitted	1.00			0.84	0.98	
Satd. Flow (perm)	1778			1552	1714	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	206	86	64	140	30	43
RTOR Reduction (vph)	9	0	0	0	39	0
Lane Group Flow (vph)	283	0	0	204	34	0
Confl. Peds. (#/hr)		8	8			
Confl. Bikes (#/hr)		2	2			
Heavy Vehicles (%)	2%	0%	2%	2%	0%	0%
Turn Type	NA		Perm	NA	Prot	
Protected Phases	2			6	8	
Permitted Phases			6			
Actuated Green, G (s)	53.2			52.3	6.8	
Effective Green, g (s)	53.2			52.3	6.8	
Actuated g/C Ratio	0.74			0.73	0.09	
Clearance Time (s)	6.0			6.9	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	1313			1127	161	
v/s Ratio Prot	c0.16				c0.02	
v/s Ratio Perm				0.13		
v/c Ratio	0.22			0.18	0.21	
Uniform Delay, d1	2.9			3.1	30.1	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.4			0.4	0.7	
Delay (s)	3.3			3.5	30.8	
Level of Service	A			A	C	
Approach Delay (s/veh)	3.3			3.5	30.8	
Approach LOS	A			A	C	

Intersection Summary

HCM 2000 Control Delay (s/veh) 6.9
HCM 2000 Volume to Capacity ratio 0.22
Actuated Cycle Length (s) 72.0
Intersection Capacity Utilization 48.1%
Analysis Period (min) 15
c Critical Lane Group

Lanes, Volumes, Timings
3: Westchester Road & Columbia Way

(230561) 9408 Columbia
Base PM

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	175	66	48	143	46	37
Future Volume (vph)	175	66	48	143	46	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.963				0.939	
Flt Protected				0.988	0.973	
Satd. Flow (prot)	1807	0	0	1840	1662	0
Flt Permitted				0.988	0.973	
Satd. Flow (perm)	1807	0	0	1840	1662	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	570.4			296.2	121.1	
Travel Time (s)	41.1			21.3	8.7	
Confl. Peds. (#/hr)		6	6			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	2%	2%	2%	4%	5%
Adj. Flow (vph)	188	71	52	154	49	40
Shared Lane Traffic (%)						
Lane Group Flow (vph)	259	0	0	206	89	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	38.4%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
3: Westchester Road & Columbia Way

(230561) 9408 Columbia
Base PM

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↗	↖
Traffic Volume (veh/h)	175	66	48	143	46	37
Future Volume (Veh/h)	175	66	48	143	46	37
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	188	71	52	154	49	40
Pedestrians					6	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			265		488	230
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			265		488	230
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		90	95
cM capacity (veh/h)			1292		512	798
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	259	206	89			
Volume Left	0	52	49			
Volume Right	71	0	40			
cSH	1700	1292	610			
Volume to Capacity	0.15	0.04	0.15			
Queue Length 95th (m)	0.0	1.0	4.1			
Control Delay (s/veh)	0.0	2.3	11.9			
Lane LOS		A	B			
Approach Delay (s/veh)	0.0	2.3	11.9			
Approach LOS			B			
Intersection Summary						
Average Delay			2.8			
Intersection Capacity Utilization		38.4%			ICU Level of Service	A
Analysis Period (min)		15				

Lanes, Volumes, Timings
4: Mount Hope Road & Columbia Way

(230561) 9408 Columbia
Base PM

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	147	41	16	120	24	19	5	9	13	7	37
Future Volume (vph)	36	147	41	16	120	24	19	5	9	13	7	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.975			0.979			0.961			0.912	
Flt Protected		0.992			0.995			0.972			0.988	
Satd. Flow (prot)	0	1770	0	0	1824	0	0	1725	0	0	1633	0
Flt Permitted		0.992			0.995			0.972			0.988	
Satd. Flow (perm)	0	1770	0	0	1824	0	0	1725	0	0	1633	0
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		296.2			237.5			421.4			3082.6	
Travel Time (s)		17.8			14.3			30.3			221.9	
Confl. Peds. (#/hr)			11	11								
Confl. Bikes (#/hr)			1	1								
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	3%	4%	4%	0%	2%	0%	0%	20%	0%	0%	8%	6%
Adj. Flow (vph)	38	156	44	17	128	26	20	5	10	14	7	39
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	238	0	0	171	0	0	35	0	0	60	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0				0.0			0.0			0.0	
Link Offset(m)	0.0				0.0			0.0			0.0	
Crosswalk Width(m)	4.8				4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control	Free				Free			Stop			Stop	

Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	30.0%											
ICU Level of Service	A											
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
4: Mount Hope Road & Columbia Way

(230561) 9408 Columbia
Base PM

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	147	41	16	120	24	19	5	9	13	7	37
Future Volume (Veh/h)	36	147	41	16	120	24	19	5	9	13	7	37
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	38	156	44	17	128	26	20	5	10	14	7	39
Pedestrians								11				
Lane Width (m)								3.6				
Walking Speed (m/s)								1.2				
Percent Blockage								1				
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	154			211			483	453	189	442	462	141
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	154			211			483	453	189	442	462	141
tC, single (s)	4.1			4.1			7.1	6.7	6.2	7.1	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.2	3.3	3.5	4.1	3.4
p0 queue free %	97			99			96	99	99	97	98	96
cM capacity (veh/h)	1420			1359			449	454	850	500	465	896

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	238	171	35	60
Volume Left	38	17	20	14
Volume Right	44	26	10	39
cSH	1420	1359	520	693
Volume to Capacity	0.03	0.01	0.07	0.09
Queue Length 95th (m)	0.7	0.3	1.7	2.3
Control Delay (s/veh)	1.4	0.9	12.4	10.7
Lane LOS	A	A	B	B
Approach Delay (s/veh)	1.4	0.9	12.4	10.7
Approach LOS		B	B	

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	30.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings

5: Caledon-King Townline South & Columbia Way

(230561) 9408 Columbia

Base PM

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	25	98	144	452	262	30
Future Volume (vph)	25	98	144	452	262	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.892				0.986	
Flt Protected	0.990			0.988		
Satd. Flow (prot)	1613	0	0	1863	1824	0
Flt Permitted	0.990			0.988		
Satd. Flow (perm)	1613	0	0	1863	1824	0
Link Speed (k/h)	60			60	60	
Link Distance (m)	504.6			1060.6	1231.4	
Travel Time (s)	30.3			63.6	73.9	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	12%	2%	0%	1%	3%	0%
Adj. Flow (vph)	26	102	150	471	273	31
Shared Lane Traffic (%)						
Lane Group Flow (vph)	128	0	0	621	304	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	64.8%			ICU Level of Service C		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

5: Caledon-King Townline South & Columbia Way

(230561) 9408 Columbia

Base PM

	EBL	EBR	NBL	NBT	SBT	SBR
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Volume (veh/h)	25	98	144	452	262	30
Future Volume (Veh/h)	25	98	144	452	262	30
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	26	102	150	471	273	31
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	1060	289	304			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1060	289	304			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	88	86	88			
cM capacity (veh/h)	210	751	1268			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	128	621	304			
Volume Left	26	150	0			
Volume Right	102	0	31			
cSH	492	1268	1700			
Volume to Capacity	0.26	0.12	0.18			
Queue Length 95th (m)	8.2	3.2	0.0			
Control Delay (s/veh)	14.9	3.0	0.0			
Lane LOS	B	A				
Approach Delay (s/veh)	14.9	3.0	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay		3.6				
Intersection Capacity Utilization		64.8%		ICU Level of Service	C	
Analysis Period (min)		15				

Lanes, Volumes, Timings (230561) 9408 Columbia
8: Mount Hope Road & Castlederg Side Road Base PM

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	285	7	11	198	24	2	40	11	18	28	8
Future Volume (vph)	57	285	7	11	198	24	2	40	11	18	28	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.986			0.972			0.979	
Flt Protected		0.992			0.998			0.998			0.984	
Satd. Flow (prot)	0	1859	0	0	1730	0	0	1738	0	0	1759	0
Flt Permitted		0.992			0.998			0.998			0.984	
Satd. Flow (perm)	0	1859	0	0	1730	0	0	1738	0	0	1759	0
Link Speed (k/h)		70			70			60			60	
Link Distance (m)		528.0			555.3			3082.6			634.1	
Travel Time (s)		27.2			28.6			185.0			38.0	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	1%	14%	9%	9%	0%	0%	8%	0%	6%	4%	0%
Adj. Flow (vph)	61	303	7	12	211	26	2	43	12	19	30	9
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	371	0	0	249	0	0	57	0	0	58	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	50.7%
Analysis Period (min)	15
ICU Level of Service A	

HCM Unsignalized Intersection Capacity Analysis (230561) 9408 Columbia
8: Mount Hope Road & Castlederg Side Road Base PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	57	285	7	11	198	24	2	40	11	18	28	8
Future Volume (vph)	57	285	7	11	198	24	2	40	11	18	28	8
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	61	303	7	12	211	26	2	43	12	19	30	9
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	371	249	57	58								
Volume Left (vph)	61	12	2	19								
Volume Right (vph)	7	26	12	9								
Hadj (s)	0.04	0.08	-0.02	0.04								
Departure Headway (s)	4.6	4.7	5.4	5.5								
Degree Utilization, x	0.47	0.33	0.09	0.09								
Capacity (veh/h)	768	728	576	578								
Control Delay (s/veh)	11.5	10.0	8.9	9.0								
Approach Delay (s/veh)	11.5	10.0	8.9	9.0								
Approach LOS	B	B	A	A								
Intersection Summary												
Delay	10.6											
Level of Service	B											
Intersection Capacity Utilization	50.7%				ICU Level of Service				A			
Analysis Period (min)	15											

Lanes, Volumes, Timings
9: Forest Gate Avenue & Columbia Way

(230561) 9408 Columbia
Base PM

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	51	79	90	81	41	28
Future Volume (vph)	51	79	90	81	41	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.918				0.945	
Flt Protected				0.974	0.971	
Satd. Flow (prot)	1737	0	0	1842	1743	0
Flt Permitted				0.974	0.971	
Satd. Flow (perm)	1737	0	0	1842	1743	0
Link Speed (k/h)	60			60	50	
Link Distance (m)	237.5			314.7	240.6	
Travel Time (s)	14.3			18.9	17.3	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	1%	0%	0%	1%	0%	0%
Adj. Flow (vph)	58	90	102	92	47	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	148	0	0	194	79	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	30.8%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
9: Forest Gate Avenue & Columbia Way

(230561) 9408 Columbia
Base PM

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↘			↘	↖	↗
Traffic Volume (veh/h)	51	79	90	81	41	28
Future Volume (Veh/h)	51	79	90	81	41	28
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	58	90	102	92	47	32
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			148		399	103
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			148		399	103
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		92	97
cM capacity (veh/h)			1446		567	957
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	148	194	79			
Volume Left	0	102	47			
Volume Right	90	0	32			
cSH	1700	1446	680			
Volume to Capacity	0.09	0.07	0.12			
Queue Length 95th (m)	0.0	1.8	3.1			
Control Delay (s/veh)	0.0	4.3	11.0			
Lane LOS		A	B			
Approach Delay (s/veh)	0.0	4.3	11.0			
Approach LOS			B			
Intersection Summary						
Average Delay			4.0			
Intersection Capacity Utilization		30.8%		ICU Level of Service		A
Analysis Period (min)		15				

Measures of Effectiveness

(230561) 9408 Columbia
Base PM

Network Totals

Number of Intersections	7
Total Delay (hr)	8
Stops (#)	2120
Average Speed (km/hr)	50
Total Travel Time (hr)	69
Distance Traveled (km)	3460
Fuel Consumed (l)	398
Fuel Economy (km/l)	8.7
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	0
Performance Index	13.5

Appendix E

ITE Trip Generation Reports



Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units

**On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.**

Setting/Location: General Urban/Suburban

Number of Studies: 192

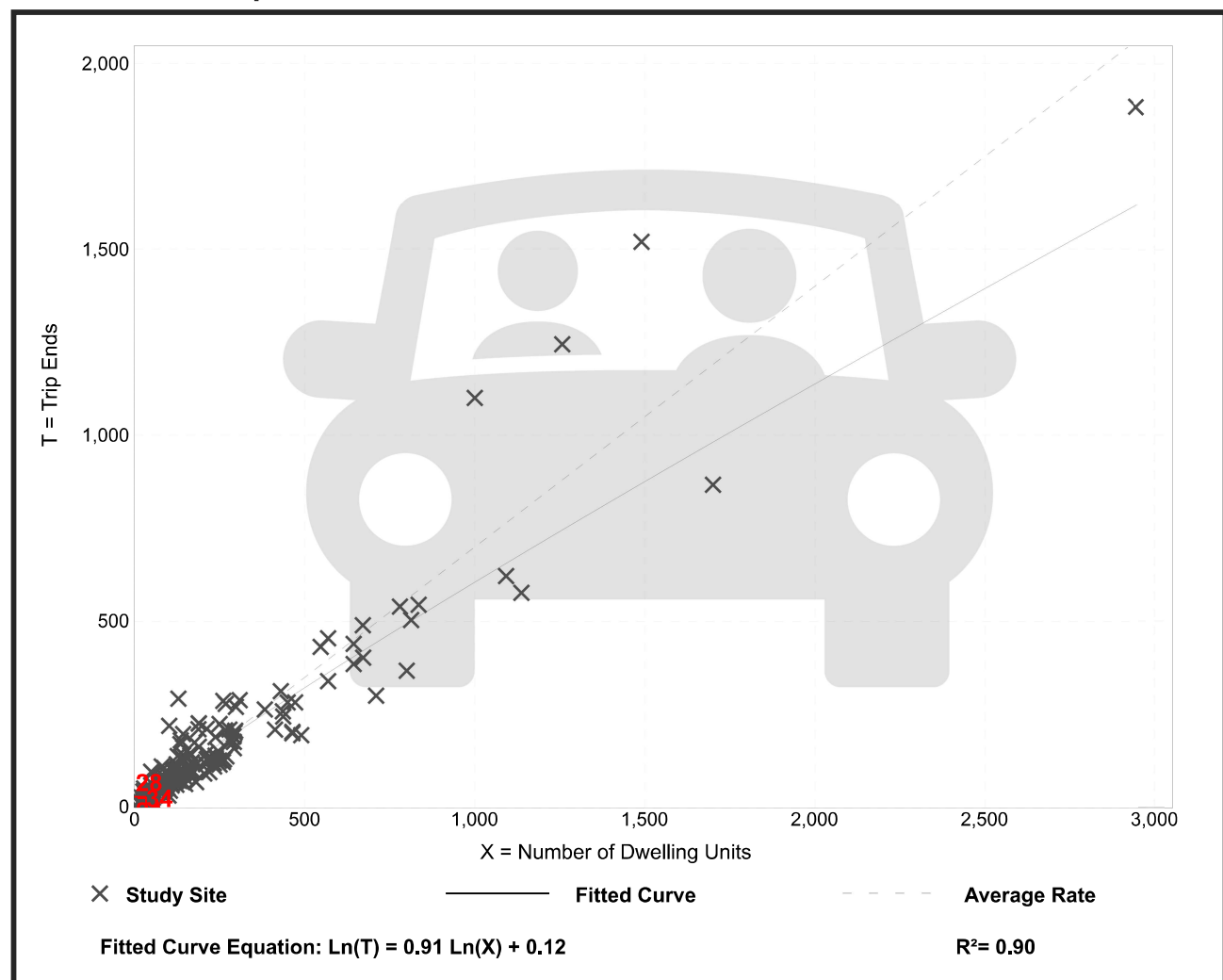
Avg. Num. of Dwelling Units: 226

Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.27 - 2.27	0.24

Data Plot and Equation



Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 208

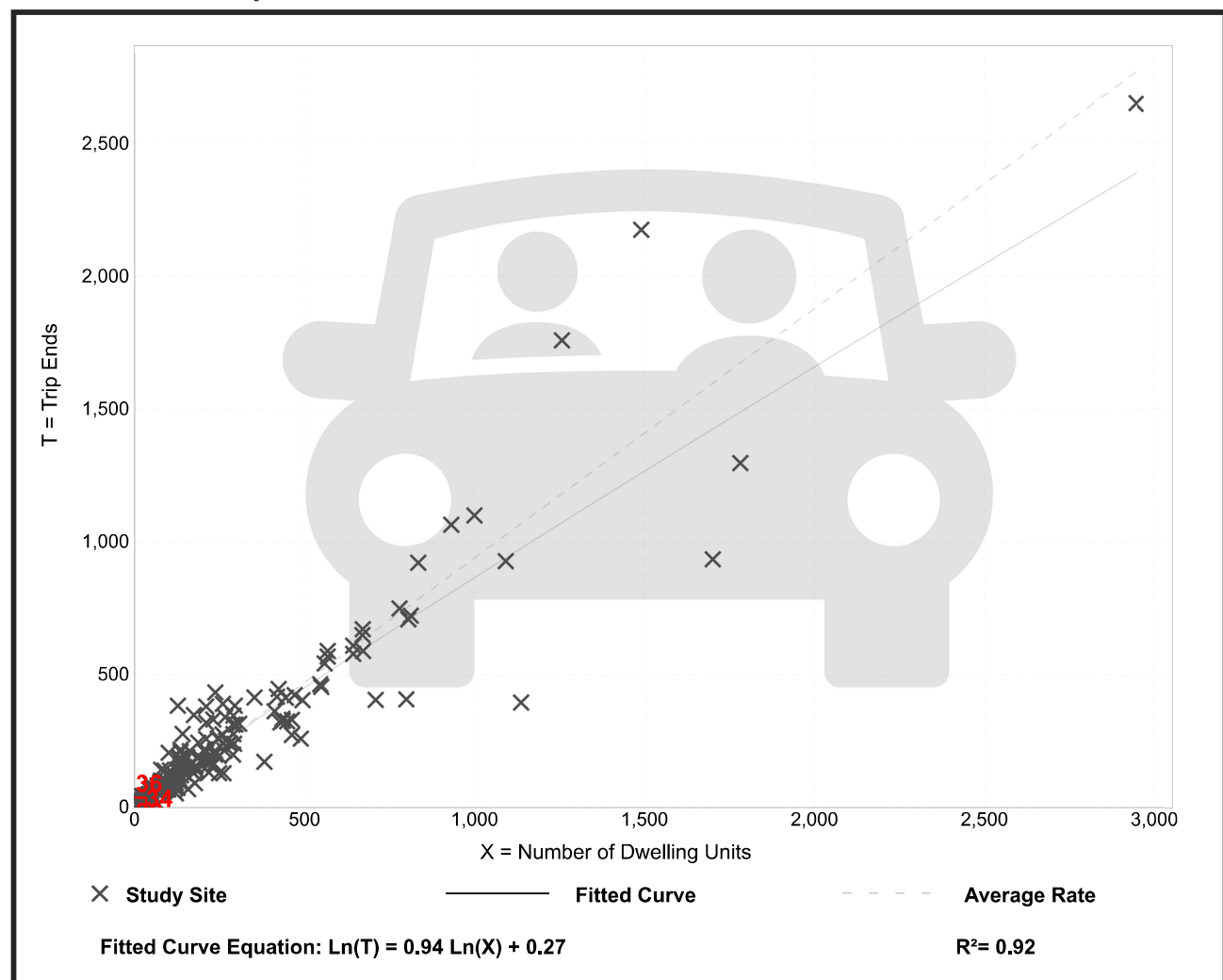
Avg. Num. of Dwelling Units: 248

Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.94	0.35 - 2.98	0.31

Data Plot and Equation



Single-Family Attached Housing (215)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 46

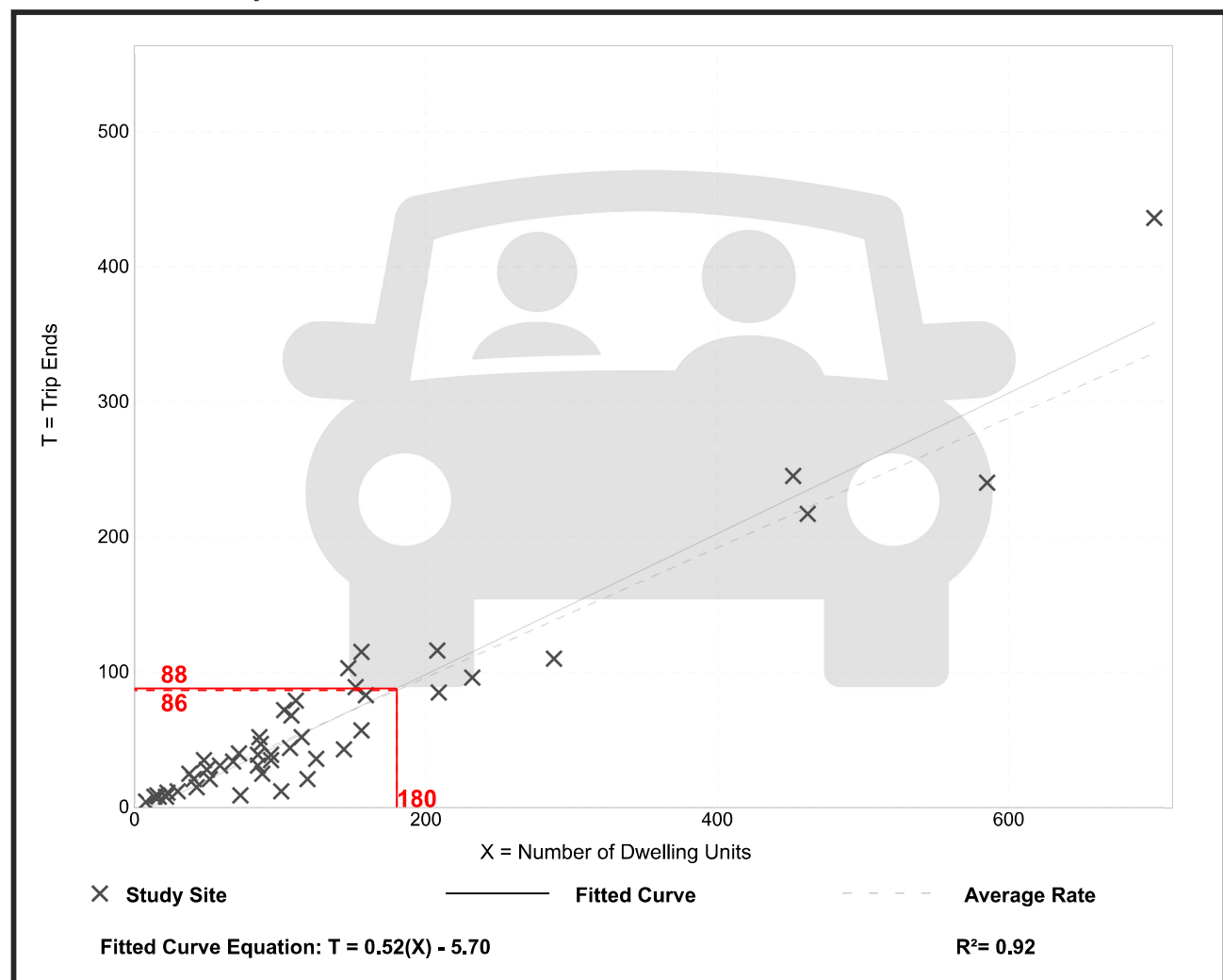
Avg. Num. of Dwelling Units: 135

Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.48	0.12 - 0.74	0.14

Data Plot and Equation



Single-Family Attached Housing (215)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 46

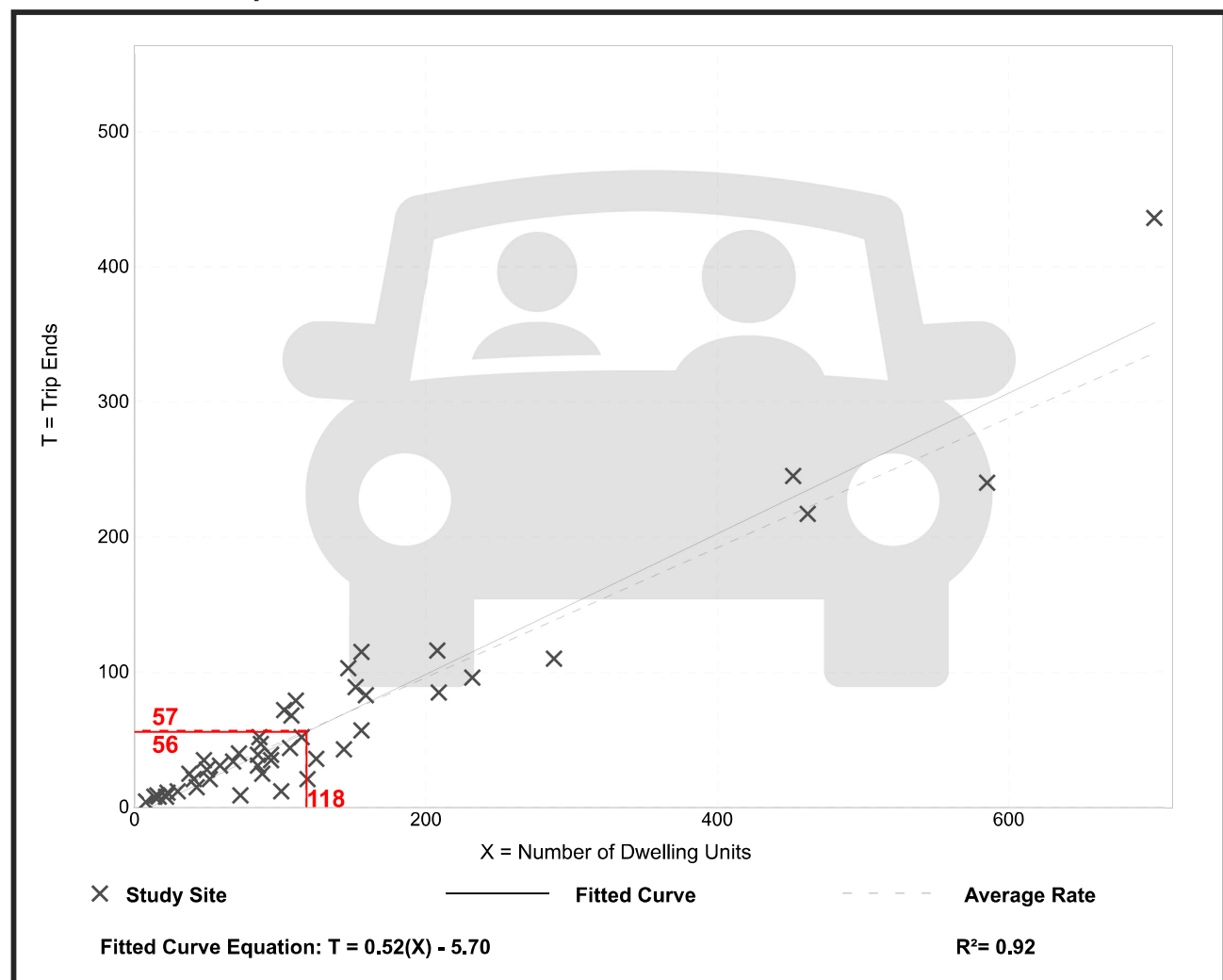
Avg. Num. of Dwelling Units: 135

Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.48	0.12 - 0.74	0.14

Data Plot and Equation



Single-Family Attached Housing (215)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 46

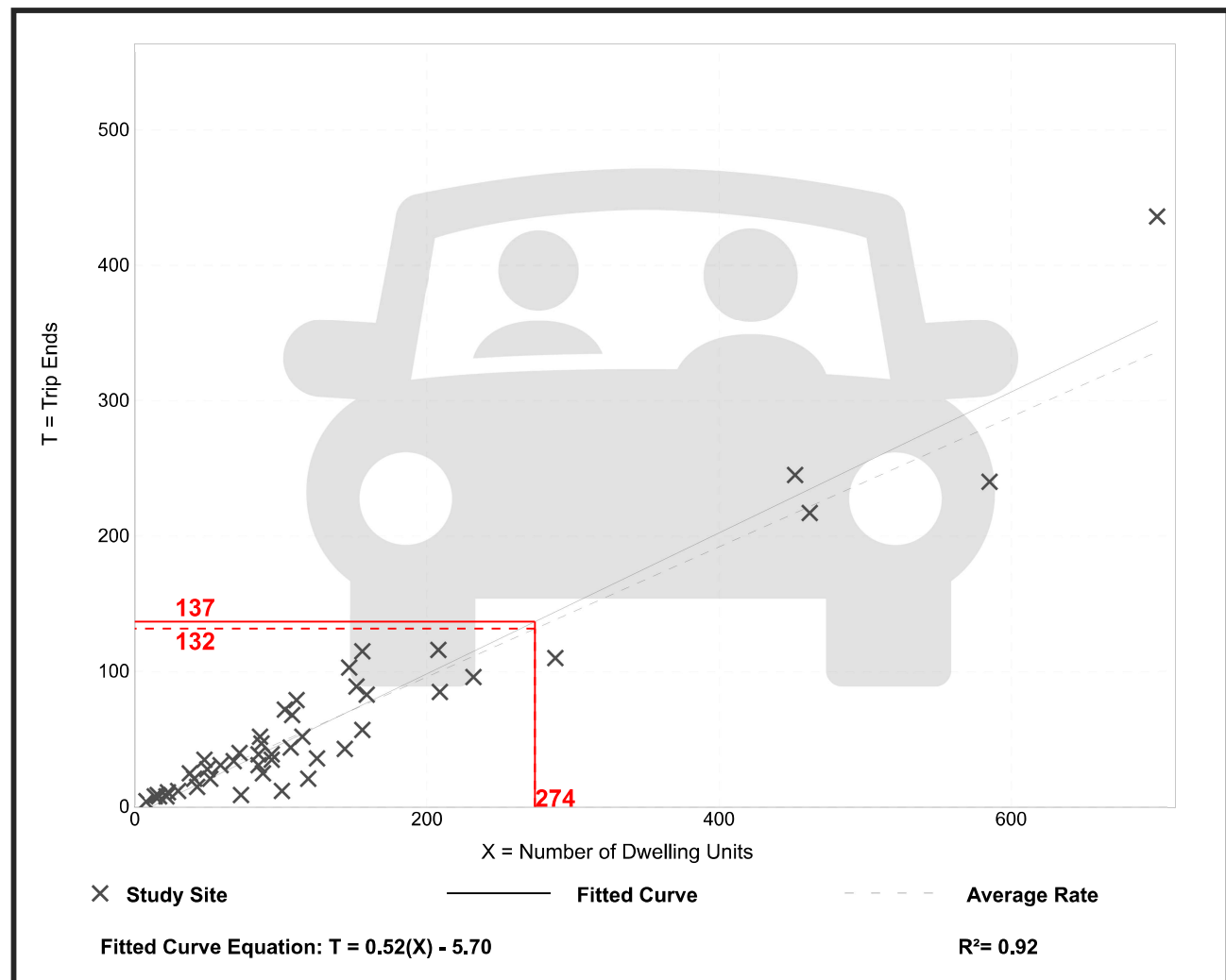
Avg. Num. of Dwelling Units: 135

Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.48	0.12 - 0.74	0.14

Data Plot and Equation



Single-Family Attached Housing (215)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 51

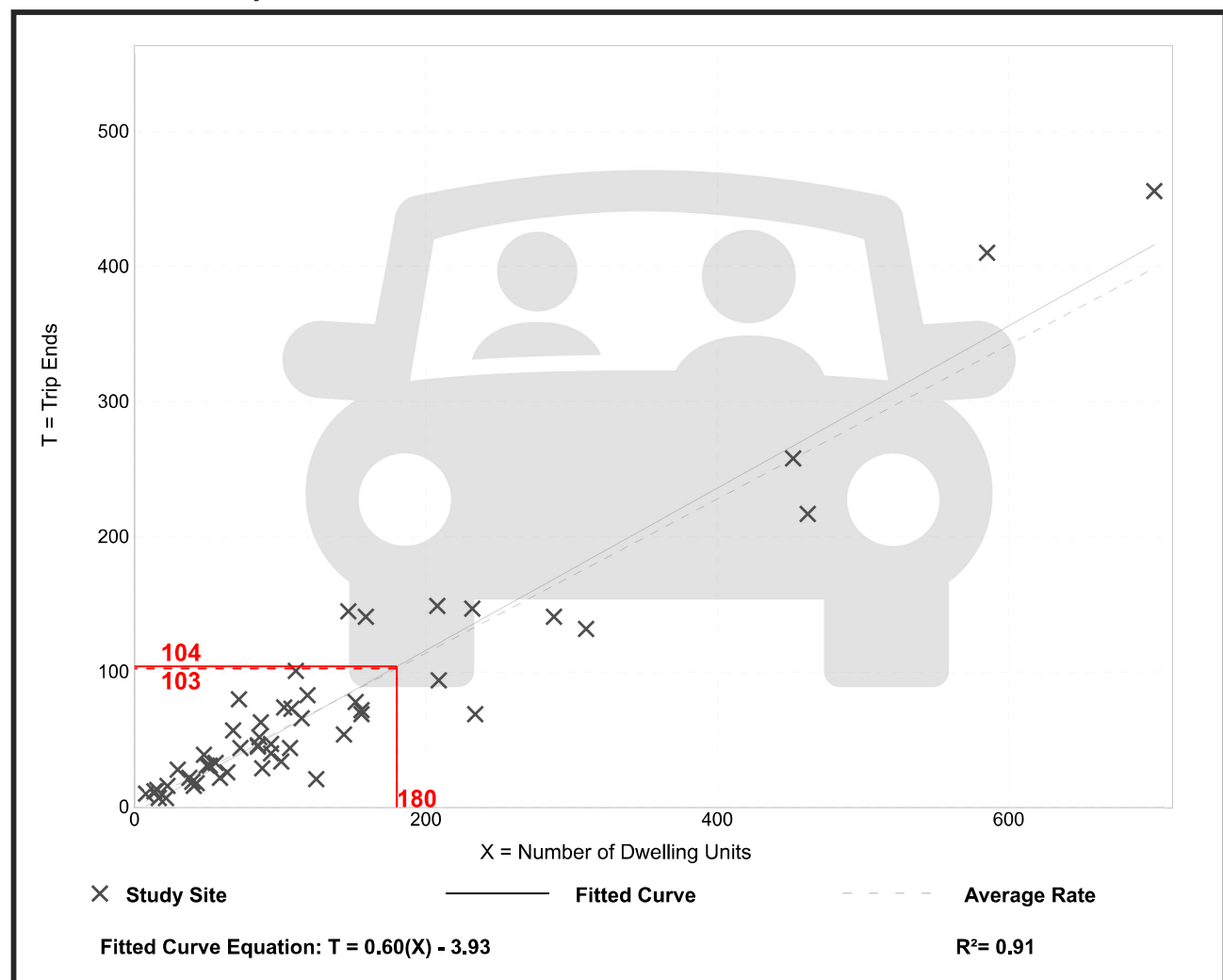
Avg. Num. of Dwelling Units: 136

Directional Distribution: 59% entering, 41% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.57	0.17 - 1.25	0.18

Data Plot and Equation



Single-Family Attached Housing (215)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 51

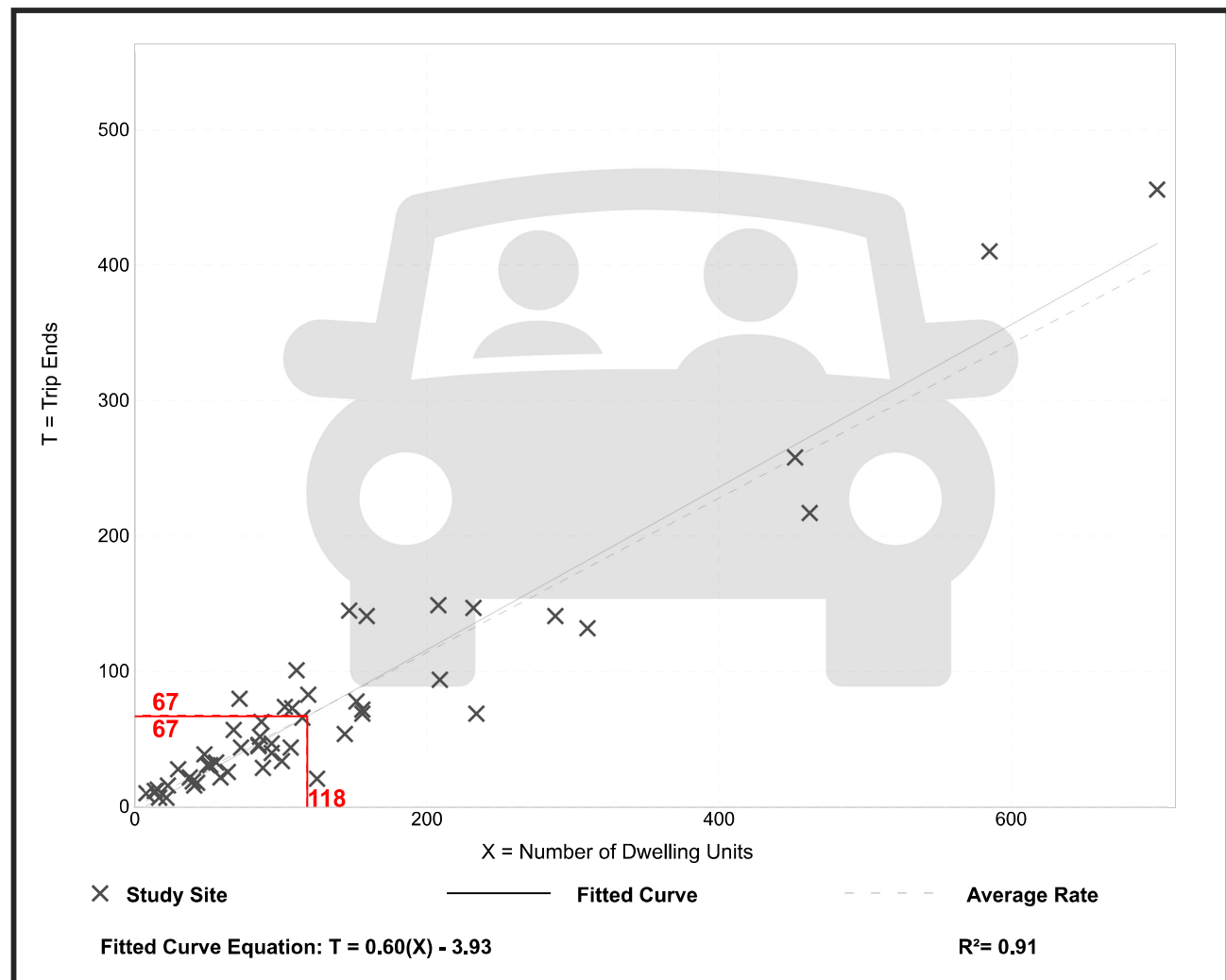
Avg. Num. of Dwelling Units: 136

Directional Distribution: 59% entering, 41% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.57	0.17 - 1.25	0.18

Data Plot and Equation



Single-Family Attached Housing (215)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 51

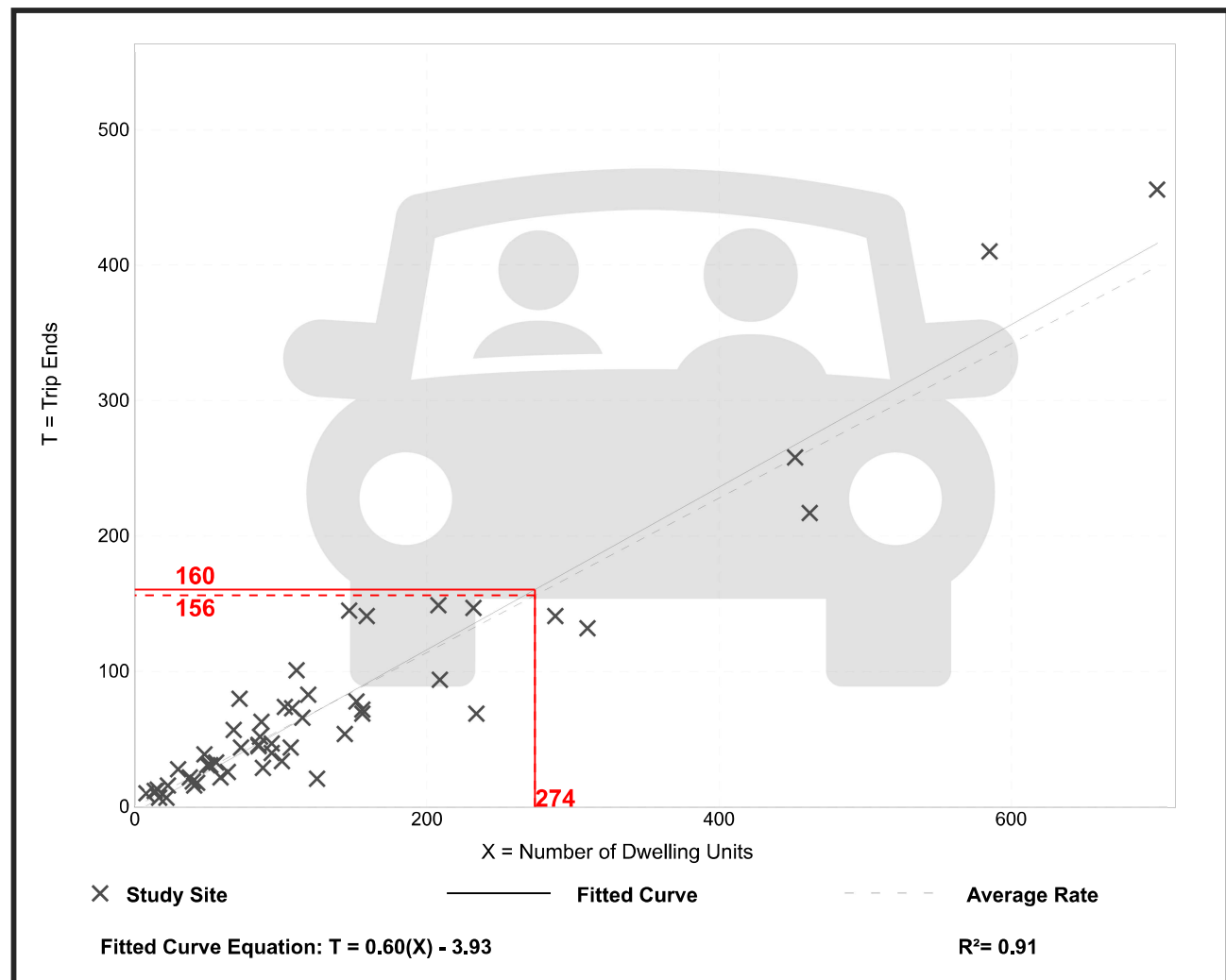
Avg. Num. of Dwelling Units: 136

Directional Distribution: 59% entering, 41% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.57	0.17 - 1.25	0.18

Data Plot and Equation



Multifamily Housing (High-Rise) Not Close to Rail Transit (222)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 45

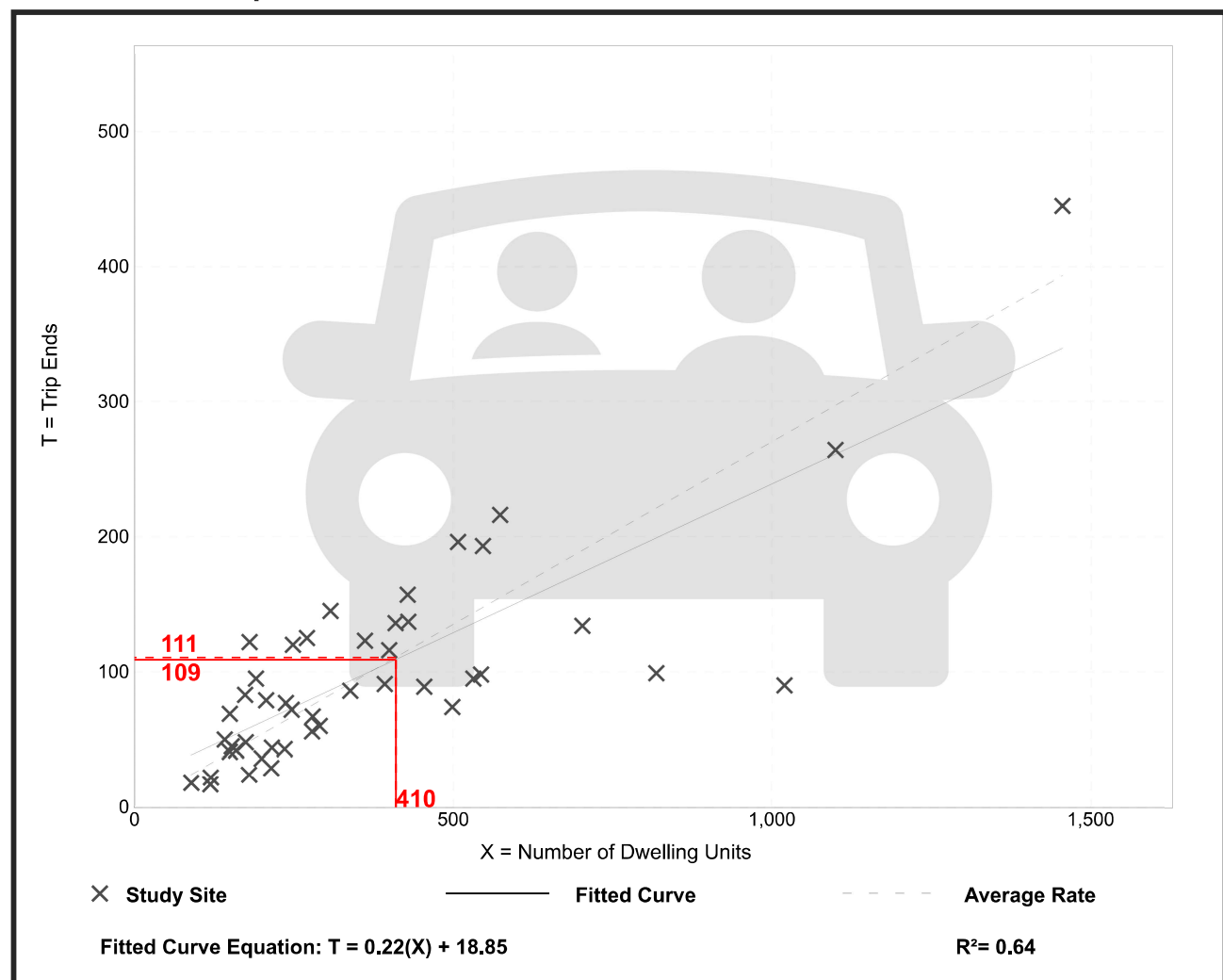
Avg. Num. of Dwelling Units: 372

Directional Distribution: 26% entering, 74% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.27	0.09 - 0.67	0.11

Data Plot and Equation



Multifamily Housing (High-Rise) Not Close to Rail Transit (222)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 45

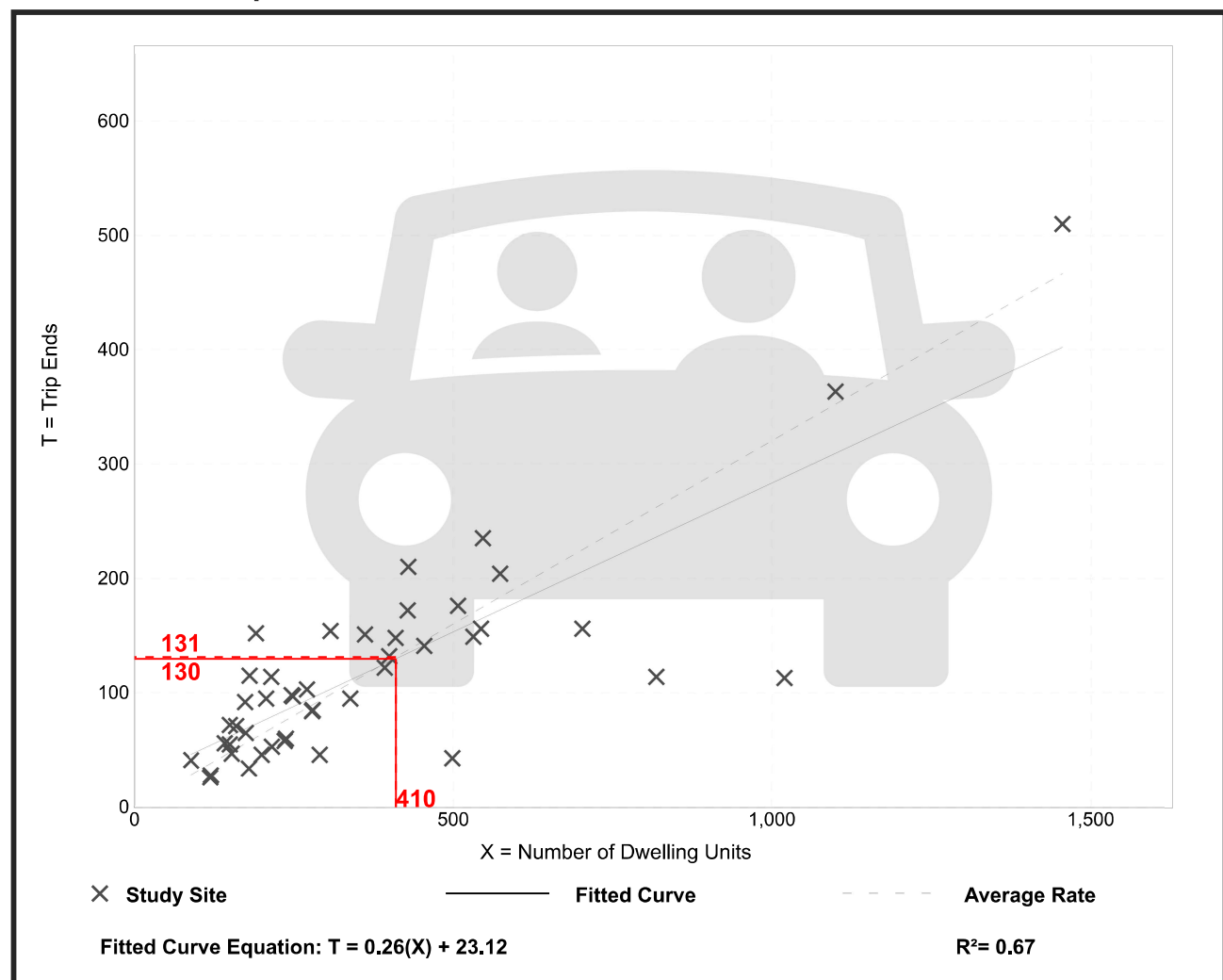
Avg. Num. of Dwelling Units: 372

Directional Distribution: 62% entering, 38% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.32	0.09 - 0.80	0.13

Data Plot and Equation



Shopping Plaza (40-150k) - Supermarket - Yes

(821)

Vehicle Trip Ends vs: 1000 Sq. Ft. GLA

On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 16

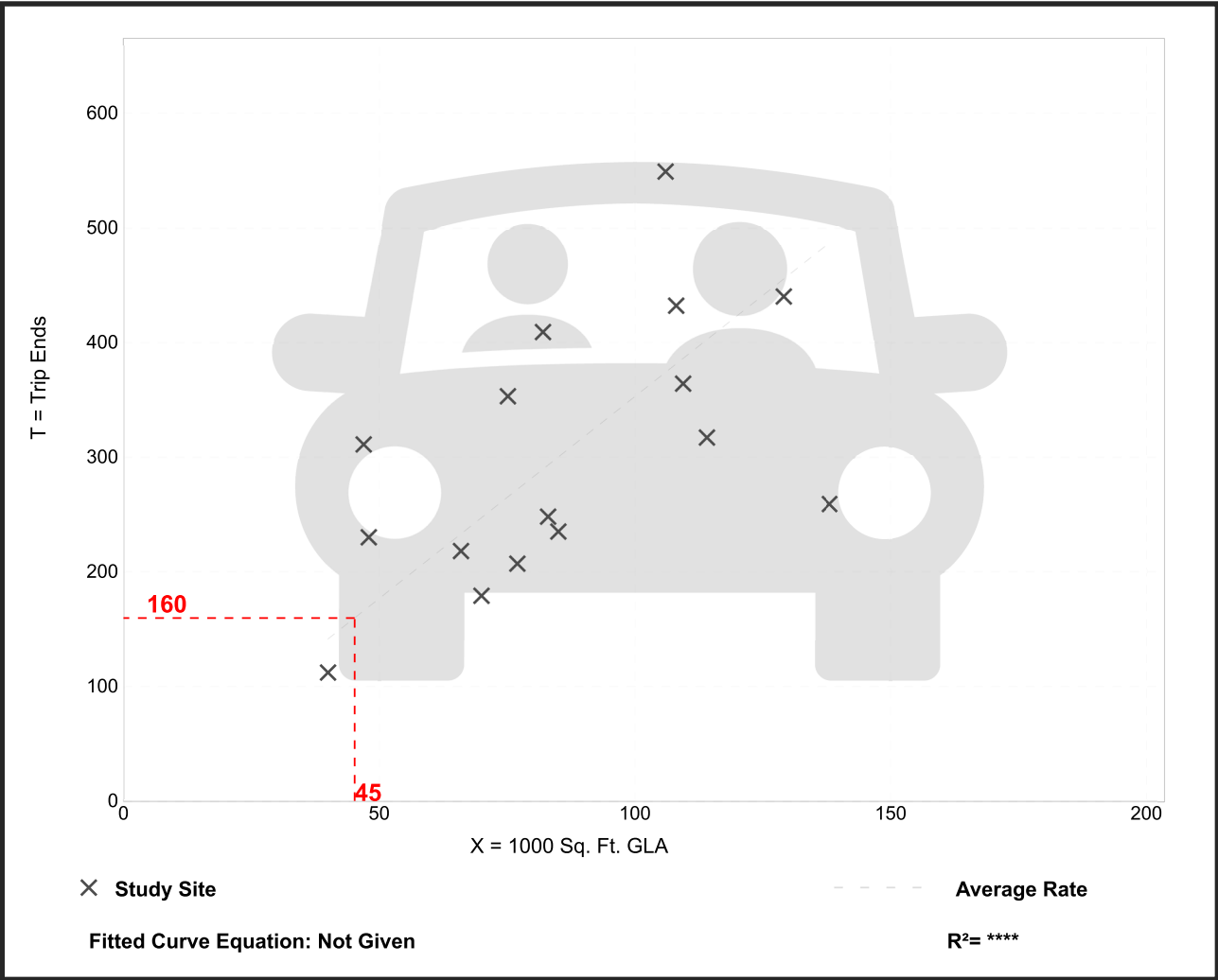
Avg. 1000 Sq. Ft. GLA: 86

Directional Distribution: 62% entering, 38% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
3.53	1.88 - 6.62	1.17

Data Plot and Equation



Shopping Plaza (40-150k) - Supermarket - Yes

(821)

Vehicle Trip Ends vs: 1000 Sq. Ft. GLA

On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 51

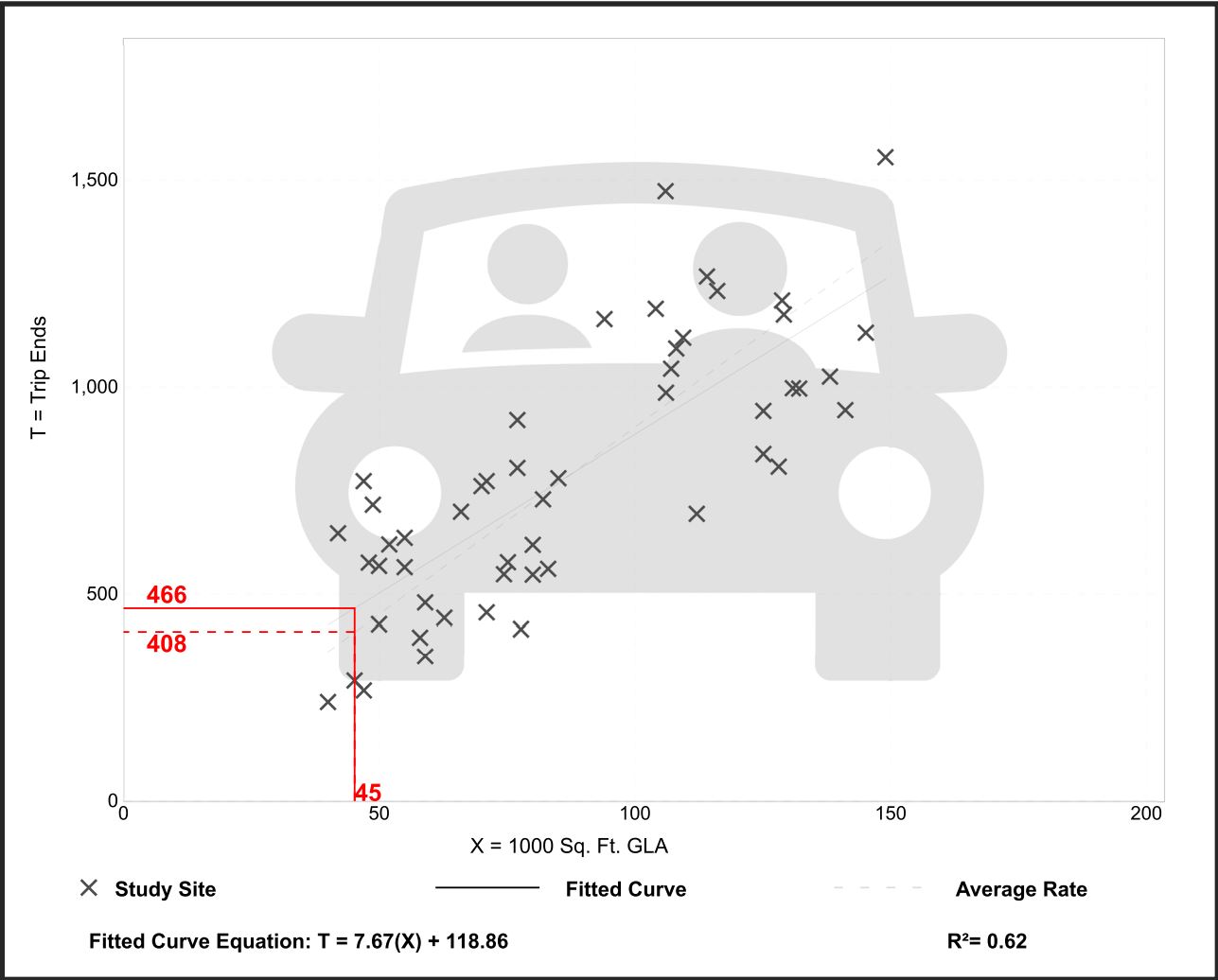
Avg. 1000 Sq. Ft. GLA: 87

Directional Distribution: 48% entering, 52% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
9.03	5.35 - 16.45	2.37

Data Plot and Equation



Appendix F

Synchro Reports – 2028 Background Operations



Lanes, Volumes, Timings
1: Hwy 50 [Peel Regional Road 50] & Columbia Way
(230561) 9408 Columbia
2028 PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	1	160	0	81	1	607	229	145	385	2
Future Volume (vph)	2	0	1	160	0	81	1	607	229	145	385	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0			0.0	60.0		0.0	136.0		300.0	85.0	25.0
Storage Lanes	0			0	1		0	1		0	1	1
Taper Length (m)	7.5			60.0			45.0			90.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					0.98							
Frt		0.955			0.850				0.850			0.850
Fit Protected		0.968		0.950		0.950			0.950			
Satd. Flow (prot)	0	1756	0	1787	1535	0	902	1863	1599	1770	1845	808
Fit Permitted		0.879		0.756		0.510			0.364			
Satd. Flow (perm)	0	1595	0	1422	1535	0	484	1863	1599	678	1845	808
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		40			255				241			33
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		56.6			246.0			735.7			477.2	
Travel Time (s)		4.1			17.7			53.0			34.4	
Confl. Bikes (#/hr)	1					1						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	1%	0%	3%	100%	2%	1%	2%	3%	100%
Adj. Flow (vph)	2	0	1	168	0	85	1	639	241	153	405	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	3	0	168	85	0	1	639	241	153	405	2
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			4			2		2		2
Permitted Phases	4			4			2		2	2		2
Detector Phase	4	4		4	4		2	2	2	2	2	2
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		20.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	25.0	25.0		25.0	25.0		30.7	30.7	30.7	30.7	30.7	30.7
Total Split (s)	36.0	36.0		36.0	36.0		64.0	64.0	64.0	64.0	64.0	64.0
Total Split (%)	36.0%	36.0%		36.0%	36.0%		64.0%	64.0%	64.0%	64.0%	64.0%	64.0%
Maximum Green (s)	30.0	30.0		30.0	30.0		57.3	57.3	57.3	57.3	57.3	57.3
Yellow Time (s)	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		2.7	2.7	2.7	2.7	2.7	2.7
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0		6.0	6.0		6.7	6.7	6.7	6.7	6.7	6.7
Lead/Lag												
Lead-Lag Optimize?												

Lanes, Volumes, Timings
1: Hwy 50 [Peel Regional Road 50] & Columbia Way
(230561) 9408 Columbia
2028 PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	8.0	8.0		8.0	8.0		8.0	8.0	8.0	8.0	8.0	8.0
Flash Don't Walk (s)	11.0	11.0		11.0	11.0		16.0	16.0	16.0	16.0	16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	17.1			17.1	17.1		70.2	70.2	70.2	70.2	70.2	70.2
Actuated g/C Ratio	0.17			0.17	0.17		0.70	0.70	0.70	0.70	0.70	0.70
v/c Ratio	0.01			0.69	0.18		0.00	0.49	0.20	0.32	0.31	0.00
Control Delay (s/veh)	0.0			53.0	0.8		6.0	9.2	1.3	9.1	7.2	0.0
Queue Delay	0.0			0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	0.0			53.0	0.8		6.0	9.2	1.3	9.1	7.2	0.0
LOS	A			D	A		A	A	A	A	A	A
Approach Delay (s/veh)				35.4			7.0			7.7		
Approach LOS				D			A			A		
Queue Length 50th (m)	0.0			32.6	0.0		0.1	51.5	0.0	10.5	27.5	0.0
Queue Length 95th (m)	0.0			50.8	0.0		0.7	95.8	8.4	26.8	52.8	0.0
Internal Link Dist (m)		32.6			222.0			711.7			453.2	
Turn Bay Length (m)				60.0			136.0		300.0	85.0		25.0
Base Capacity (vph)		506		426	639		339	1307	1194	475	1294	576
Starvation Cap Reductn		0		0	0		0	0	0	0	0	0
Spillback Cap Reductn		0		0	0		0	0	0	0	0	0
Storage Cap Reductn		0		0	0		0	0	0	0	0	0
Reduced v/c Ratio		0.01		0.39	0.13		0.00	0.49	0.20	0.32	0.31	0.00

Intersection Summary	
Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	100
Offset:	15 (15%), Referenced to phase 2:NBSB and 6:, Start of Green
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.69
Intersection Signal Delay (s/veh):	11.5
Intersection Capacity Utilization	76.9%
Analysis Period (min)	15
Intersection LOS:	B
ICU Level of Service	D

Splits and Phases: 1: Hwy 50 [Peel Regional Road 50] & Columbia Way



HCM Signalized Intersection Capacity Analysis
1: Hwy 50 [Peel Regional Road 50] & Columbia Way

(230561) 9408 Columbia
2028 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	1	160	0	81	1	607	229	145	385	2
Future Volume (vph)	2	0	1	160	0	81	1	607	229	145	385	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0		6.7	6.7		6.7	6.7	6.7
Lane Util. Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes		1.00		1.00	0.98		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt		0.96		1.00	0.85		1.00	1.00		0.85	1.00	0.85
Flt Protected		0.97		0.95	1.00		0.95	1.00		1.00	0.95	1.00
Satd. Flow (prot)		1756		1787	1533		903	1863		1599	1770	1845
Flt Permitted		0.88		0.76	1.00		0.51	1.00		1.00	0.36	1.00
Satd. Flow (perm)		1594		1422	1533		484	1863		1599	678	1845
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2	0	1	168	0	85	1	639	241	153	405	2
RTOR Reduction (vph)	0	2	0	0	70	0	0	0	72	0	0	1
Lane Group Flow (vph)	0	1	0	168	15	0	1	639	169	153	405	1
Confl. Bikes (#/hr)	1					1						
Heavy Vehicles (%)	0%	0%	0%	1%	0%	3%	100%	2%	1%	2%	3%	100%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			4			2		2		2
Permitted Phases	4			4			2		2	2		2
Actuated Green, G (s)	17.1			17.1	17.1		70.2	70.2	70.2	70.2	70.2	70.2
Effective Green, g (s)	17.1			17.1	17.1		70.2	70.2	70.2	70.2	70.2	70.2
Actuated g/C Ratio	0.17			0.17	0.17		0.70	0.70	0.70	0.70	0.70	0.70
Clearance Time (s)	6.0			6.0	6.0		6.7	6.7	6.7	6.7	6.7	6.7
Vehicle Extension (s)	3.0			3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	272			243	262		339	1307	1122	475	1295	567
v/s Ratio Prot					0.01			c0.34			0.22	
v/s Ratio Perm	0.00			c0.12			0.00		0.11	0.23		0.00
v/c Ratio	0.00			0.69	0.06		0.00	0.49	0.15	0.32	0.31	0.00
Uniform Delay, d1	34.4			39.0	34.7		4.4	6.8	5.0	5.7	5.7	4.4
Progression Factor	1.00			1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0			8.2	0.1		0.0	1.3	0.3	1.8	0.6	0.0
Delay (s)	34.4			47.2	34.8		4.5	8.1	5.3	7.5	6.3	4.5
Level of Service	C			D	C		A	A	A	A	A	A
Approach Delay (s/veh)	34.4				43.0			7.3			6.6	
Approach LOS	C				D			A			A	
Intersection Summary												
HCM 2000 Control Delay (s/veh)	12.5			HCM 2000 Level of Service				B				
HCM 2000 Volume to Capacity ratio	0.53											
Actuated Cycle Length (s)	100.0			Sum of lost time (s)				12.7				
Intersection Capacity Utilization	76.9%			ICU Level of Service				D				
Analysis Period (min)	15											
c Critical Lane Group												

Lanes, Volumes, Timings
2: Kingsview Drive & Columbia Way

(230561) 9408 Columbia
2028 PM

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	237	91	60	189	39	40
Future Volume (vph)	237	91	60	189	39	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99			1.00		
Frt	0.962				0.931	
Flt Protected				0.988	0.976	
Satd. Flow (prot)	1781	0	0	1840	1726	0
Flt Permitted				0.854	0.976	
Satd. Flow (perm)	1781	0	0	1587	1726	0
Right Turn on Red	Yes					Yes
Satd. Flow (RTOR)	33				43	
Link Speed (k/h)	50			50	50	
Link Distance (m)	246.0			351.6	165.2	
Travel Time (s)	17.7			25.3	11.9	
Confl. Peds. (#/hr)		8		8		
Confl. Bikes (#/hr)		2		2		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	0%	2%	2%	0%	0%
Adj. Flow (vph)	252	97	64	201	41	43
Shared Lane Traffic (%)						
Lane Group Flow (vph)	349	0	0	265	84	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15		25	25	15
Turn Type	NA		Perm	NA	Prot	
Protected Phases	2			6	8	
Permitted Phases				6		
Detector Phase	2			6	6	8
Switch Phase						
Minimum Initial (s)	8.0			8.0	8.0	
Minimum Split (s)	36.0			32.0	32.0	36.0
Total Split (s)	36.0			32.0	32.0	36.0
Total Split (%)	50.0%			44.4%	44.4%	50.0%
Maximum Green (s)	30.0			25.1	25.1	30.0
Yellow Time (s)	4.0			4.0	4.0	4.0
All-Red Time (s)	2.0			2.9	2.9	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	6.0			6.9	6.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	C-Max	None

Lanes, Volumes, Timings
2: Kingsview Drive & Columbia Way

(230561) 9408 Columbia
2028 PM

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Walk Time (s)	8.0		8.0	8.0	8.0	
Flash Don't Walk (s)	7.0		7.0	7.0	7.0	
Pedestrian Calls (#/hr)	0		0	0	0	
Act Effct Green (s)	55.3		54.6	8.7		
Actuated g/C Ratio	0.77		0.76	0.12		
v/c Ratio	0.25		0.22	0.34		
Control Delay (s/veh)	3.7		4.3	20.6		
Queue Delay	0.0		0.0	0.0		
Total Delay (s/veh)	3.7		4.3	20.6		
LOS	A		A	C		
Approach Delay (s/veh)	3.7		4.3	20.6		
Approach LOS	A		A	C		
Queue Length 50th (m)	12.0		10.5	5.4		
Queue Length 95th (m)	24.2		21.6	17.1		
Internal Link Dist (m)	222.0		327.6	141.2		
Turn Bay Length (m)						
Base Capacity (vph)	1376		1204	744		
Starvation Cap Reductn	0		0	0		
Spillback Cap Reductn	0		0	0		
Storage Cap Reductn	0		0	0		
Reduced v/c Ratio	0.25		0.22	0.11		

Intersection Summary

Area Type: Other
 Cycle Length: 72
 Actuated Cycle Length: 72
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.34
 Intersection Signal Delay (s/veh): 6.0
 Intersection LOS: A
 Intersection Capacity Utilization 53.9%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 2: Kingsview Drive & Columbia Way



HCM Signalized Intersection Capacity Analysis
2: Kingsview Drive & Columbia Way

(230561) 9408 Columbia
2028 PM

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩			↩	↩	↩
Traffic Volume (vph)	237	91	60	189	39	40
Future Volume (vph)	237	91	60	189	39	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.9	6.0	
Lane Util. Factor	1.00			1.00	1.00	
Frpb, ped/bikes	0.99			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.96			1.00	0.93	
Flt Protected	1.00			0.99	0.98	
Satd. Flow (prot)	1783			1835	1727	
Flt Permitted	1.00			0.85	0.98	
Satd. Flow (perm)	1783			1586	1727	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	252	97	64	201	41	43
RTOR Reduction (vph)	9	0	0	0	39	0
Lane Group Flow (vph)	340	0	0	265	45	0
Confl. Peds. (#/hr)	8		8			
Confl. Bikes (#/hr)	2		2			
Heavy Vehicles (%)	2%	0%	2%	2%	0%	0%
Turn Type	NA		Perm	NA	Prot	
Protected Phases	2			6	8	
Permitted Phases			6			
Actuated Green, G (s)	52.9			52.0	7.1	
Effective Green, g (s)	52.9			52.0	7.1	
Actuated g/C Ratio	0.73			0.72	0.10	
Clearance Time (s)	6.0			6.9	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	1310			1145	170	
v/s Ratio Prot	c0.19				c0.03	
v/s Ratio Perm				0.17		
v/c Ratio	0.26			0.23	0.27	
Uniform Delay, d1	3.1			3.3	30.0	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.5			0.5	0.8	
Delay (s)	3.6			3.8	30.9	
Level of Service	A			A	C	
Approach Delay (s/veh)	3.6			3.8	30.9	
Approach LOS	A			A	C	

Intersection Summary

HCM 2000 Control Delay (s/veh)	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	12.9
Intersection Capacity Utilization	53.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
3: Westchester Road & Columbia Way

(230561) 9408 Columbia
2028 PM

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	213	69	48	198	49	37
Future Volume (vph)	213	69	48	198	49	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.967				0.942	
Flt Protected				0.990	0.972	
Satd. Flow (prot)	1815	0	0	1844	1666	0
Flt Permitted				0.990	0.972	
Satd. Flow (perm)	1815	0	0	1844	1666	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	570.4			296.2	121.1	
Travel Time (s)	41.1			21.3	8.7	
Confl. Peds. (#/hr)		6	6			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	2%	2%	2%	4%	5%
Adj. Flow (vph)	229	74	52	213	53	40
Shared Lane Traffic (%)						
Lane Group Flow (vph)	303	0	0	265	93	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	43.6%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
3: Westchester Road & Columbia Way

(230561) 9408 Columbia
2028 PM

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↗	↖
Traffic Volume (veh/h)	213	69	48	198	49	37
Future Volume (Veh/h)	213	69	48	198	49	37
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	229	74	52	213	53	40
Pedestrians					6	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			309		589	272
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			309		589	272
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		88	95
cM capacity (veh/h)			1245		446	756
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	303	265	93			
Volume Left	0	52	53			
Volume Right	74	0	40			
cSH	1700	1245	541			
Volume to Capacity	0.18	0.04	0.17			
Queue Length 95th (m)	0.0	1.0	4.9			
Control Delay (s/veh)	0.0	1.9	13.0			
Lane LOS		A	B			
Approach Delay (s/veh)	0.0	1.9	13.0			
Approach LOS			B			
Intersection Summary						
Average Delay			2.6			
Intersection Capacity Utilization		43.6%		ICU Level of Service	A	
Analysis Period (min)		15				

Lanes, Volumes, Timings
4: Mount Hope Road & Columbia Way

(230561) 9408 Columbia
2028 PM

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	182	45	18	172	26	21	6	10	14	8	41
Future Volume (vph)	40	182	45	18	172	26	21	6	10	14	8	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.977			0.984			0.962			0.913	
Flt Protected		0.993			0.996			0.973			0.989	
Satd. Flow (prot)	0	1775	0	0	1833	0	0	1725	0	0	1635	0
Flt Permitted		0.993			0.996			0.973			0.989	
Satd. Flow (perm)	0	1775	0	0	1833	0	0	1725	0	0	1635	0
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		296.2			237.5			421.4			3082.6	
Travel Time (s)		17.8			14.3			30.3			221.9	
Confl. Peds. (#/hr)			11	11								
Confl. Bikes (#/hr)			1	1								
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	3%	4%	4%	0%	2%	0%	0%	20%	0%	0%	8%	6%
Adj. Flow (vph)	43	194	48	19	183	28	22	6	11	15	9	44
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	285	0	0	230	0	0	39	0	0	68	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0				0.0			0.0			0.0	
Link Offset(m)	0.0				0.0			0.0			0.0	
Crosswalk Width(m)	4.8				4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	34.8%											
ICU Level of Service A												
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
4: Mount Hope Road & Columbia Way

(230561) 9408 Columbia
2028 PM

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	182	45	18	172	26	21	6	10	14	8	41
Future Volume (Veh/h)	40	182	45	18	172	26	21	6	10	14	8	41
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	43	194	48	19	183	28	22	6	11	15	9	44
Pedestrians								11				
Lane Width (m)								3.6				
Walking Speed (m/s)								1.2				
Percent Blockage								1				
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	211			253			599	564	229	553	574	197
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	211			253			599	564	229	553	574	197
tC, single (s)	4.1			4.1			7.1	6.7	6.2	7.1	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.2	3.3	3.5	4.1	3.4
p0 queue free %	97			99			94	98	99	96	98	95
cM capacity (veh/h)	1354			1312			368	388	808	417	398	834

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	285	230	39	68
Volume Left	43	19	22	15
Volume Right	48	28	11	44
cSH	1354	1312	439	611
Volume to Capacity	0.03	0.01	0.09	0.11
Queue Length 95th (m)	0.8	0.4	2.3	3.0
Control Delay (s/veh)	1.4	0.8	14.0	11.6
Lane LOS	A	A	B	B
Approach Delay (s/veh)	1.4	0.8	14.0	11.6
Approach LOS		B	B	

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	34.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings

5: Caledon-King Townline South & Columbia Way

(230561) 9408 Columbia

2028 PM

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	37	118	178	502	294	54
Future Volume (vph)	37	118	178	502	294	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.897				0.979	
Flt Protected	0.988			0.987		
Satd. Flow (prot)	1613	0	0	1862	1814	0
Flt Permitted	0.988			0.987		
Satd. Flow (perm)	1613	0	0	1862	1814	0
Link Speed (k/h)	60			60	60	
Link Distance (m)	504.6			1060.6	1231.4	
Travel Time (s)	30.3			63.6	73.9	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	12%	2%	0%	1%	3%	0%
Adj. Flow (vph)	39	123	185	523	306	56
Shared Lane Traffic (%)						
Lane Group Flow (vph)	162	0	0	708	362	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	74.3%			ICU Level of Service D		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

5: Caledon-King Townline South & Columbia Way

(230561) 9408 Columbia

2028 PM

	EBL	EBR	NBL	NBT	SBT	SBR
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Volume (veh/h)	37	118	178	502	294	54
Future Volume (Veh/h)	37	118	178	502	294	54
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	39	123	185	523	306	56
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	1227	334	362			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1227	334	362			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	75	83	85			
cM capacity (veh/h)	159	708	1208			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	162	708	362			
Volume Left	39	185	0			
Volume Right	123	0	56			
cSH	387	1208	1700			
Volume to Capacity	0.42	0.15	0.21			
Queue Length 95th (m)	16.1	4.3	0.0			
Control Delay (s/veh)	20.9	3.6	0.0			
Lane LOS	C	A				
Approach Delay (s/veh)	20.9	3.6	0.0			
Approach LOS	C					
Intersection Summary						
Average Delay		4.8				
Intersection Capacity Utilization		74.3%		ICU Level of Service	D	
Analysis Period (min)		15				

Lanes, Volumes, Timings
8: Mount Hope Road & Castlederg Side Road (230561) 9408 Columbia
2028 PM

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	315	8	12	219	26	2	44	12	20	31	9
Future Volume (vph)	63	315	8	12	219	26	2	44	12	20	31	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.986			0.972			0.979	
Flt Protected		0.992			0.998			0.998			0.984	
Satd. Flow (prot)	0	1858	0	0	1730	0	0	1738	0	0	1759	0
Flt Permitted		0.992			0.998			0.998			0.984	
Satd. Flow (perm)	0	1858	0	0	1730	0	0	1738	0	0	1759	0
Link Speed (k/h)		70			70			60			60	
Link Distance (m)		528.0			555.3			3082.6			634.1	
Travel Time (s)		27.2			28.6			185.0			38.0	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	1%	14%	9%	9%	0%	0%	8%	0%	6%	4%	0%
Adj. Flow (vph)	67	335	9	13	233	28	2	47	13	21	33	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	411	0	0	274	0	0	62	0	0	64	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary		
Area Type:	Other	
Control Type:	Unsignalized	
Intersection Capacity Utilization	54.3%	ICU Level of Service A
Analysis Period (min)	15	

HCM Unsignalized Intersection Capacity Analysis
8: Mount Hope Road & Castlederg Side Road (230561) 9408 Columbia
2028 PM

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	63	315	8	12	219	26	2	44	12	20	31	9
Future Volume (vph)	63	315	8	12	219	26	2	44	12	20	31	9
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	67	335	9	13	233	28	2	47	13	21	33	10
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	411	274	62	64								
Volume Left (vph)	67	13	2	21								
Volume Right (vph)	9	28	13	10								
Hadj (s)	0.04	0.09	-0.02	0.04								
Departure Headway (s)	4.6	4.8	5.6	5.7								
Degree Utilization, x	0.53	0.37	0.10	0.10								
Capacity (veh/h)	745	712	551	552								
Control Delay (s/veh)	12.8	10.6	9.2	9.3								
Approach Delay (s/veh)	12.8	10.6	9.2	9.3								
Approach LOS	B	B	A	A								
Intersection Summary												
Delay				11.5								
Level of Service				B								
Intersection Capacity Utilization				54.3%								
ICU Level of Service				A								
Analysis Period (min)				15								

Lanes, Volumes, Timings
9: Forest Gate Avenue & Columbia Way

(230561) 9408 Columbia
2028 PM

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	76	79	90	129	41	28
Future Volume (vph)	76	79	90	129	41	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.931				0.945	
Flt Protected				0.980	0.971	
Satd. Flow (prot)	1760	0	0	1851	1743	0
Flt Permitted				0.980	0.971	
Satd. Flow (perm)	1760	0	0	1851	1743	0
Link Speed (k/h)	60			60	50	
Link Distance (m)	237.5			314.7	240.6	
Travel Time (s)	14.3			18.9	17.3	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	1%	0%	0%	1%	0%	0%
Adj. Flow (vph)	86	90	102	147	47	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	176	0	0	249	79	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	34.6%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
9: Forest Gate Avenue & Columbia Way

(230561) 9408 Columbia
2028 PM

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	76	79	90	129	41	28
Future Volume (Veh/h)	76	79	90	129	41	28
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	86	90	102	147	47	32
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			176		482	131
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			176		482	131
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		91	97
cM capacity (veh/h)			1412		507	924
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	176	249	79			
Volume Left	0	102	47			
Volume Right	90	0	32			
cSH	1700	1412	621			
Volume to Capacity	0.10	0.07	0.13			
Queue Length 95th (m)	0.0	1.9	3.5			
Control Delay (s/veh)	0.0	3.5	11.6			
Lane LOS		A	B			
Approach Delay (s/veh)	0.0	3.5	11.6			
Approach LOS			B			
Intersection Summary						
Average Delay			3.6			
Intersection Capacity Utilization	34.6%			ICU Level of Service		A
Analysis Period (min)	15					

Measures of Effectiveness

(230561) 9408 Columbia
2028 PM

Network Totals

Number of Intersections	7
Total Delay (hr)	11
Stops (#)	2718
Average Speed (km/hr)	49
Total Travel Time (hr)	85
Distance Traveled (km)	4134
Fuel Consumed (l)	486
Fuel Economy (km/l)	8.5
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	0
Performance Index	19.0

Appendix G

Synchro Reports – 2028 Total Operations



Lanes, Volumes, Timings
1: Hwy 50 [Peel Regional Road 50] & Columbia Way
(230561) 9408 Columbia
2028 AM Total

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	3	9	325	2	206	2	292	227	221	466	0
Future Volume (vph)	6	3	9	325	2	206	2	292	227	221	466	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	60.0		0.0	136.0		300.0	85.0		25.0
Storage Lanes	0		0	1		0	1		0	1		1
Taper Length (m)	7.5			60.0			45.0			90.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							1.00					
Frt		0.935			0.852			0.850				
Flt Protected		0.983		0.950			0.950		0.950			
Satd. Flow (prot)	0	1399	0	1736	1500	0	1805	1727	1524	1656	1863	1900
Flt Permitted		0.898		0.742			0.318		0.488			
Satd. Flow (perm)	0	1278	0	1356	1500	0	603	1727	1524	851	1863	1900
Right Turn on Red			Yes		Yes			Yes		Yes		Yes
Satd. Flow (RTOR)		11			261				287			
Link Speed (k/h)		50			50			50		50		
Link Distance (m)		56.6			246.0			735.7		477.2		
Travel Time (s)		4.1			17.7			53.0		34.4		
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	20%	67%	13%	4%	0%	8%	0%	10%	6%	9%	2%	0%
Adj. Flow (vph)	8	4	11	411	3	261	3	370	287	280	590	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	23	0	411	264	0	3	370	287	280	590	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6		3.6		
Link Offset(m)		0.0			0.0			0.0		0.0		
Crosswalk Width(m)		4.8			4.8			4.8		4.8		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2		2	2		2
Detector Phase	4	4		4	4		2	2	2	2	2	2
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		20.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	25.0	25.0		25.0	25.0		30.7	30.7	30.7	30.7	30.7	30.7
Total Split (s)	45.0	45.0		45.0	45.0		65.0	65.0	65.0	65.0	65.0	65.0
Total Split (%)	40.9%	40.9%		40.9%	40.9%		59.1%	59.1%	59.1%	59.1%	59.1%	59.1%
Maximum Green (s)	39.0	39.0		39.0	39.0		58.3	58.3	58.3	58.3	58.3	58.3
Yellow Time (s)	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		2.7	2.7	2.7	2.7	2.7	2.7
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0		6.0	6.0		6.7	6.7	6.7	6.7	6.7	6.7
Lead/Lag												
Lead-Lag Optimize?												

Lanes, Volumes, Timings
1: Hwy 50 [Peel Regional Road 50] & Columbia Way
(230561) 9408 Columbia
2028 AM Total

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	8.0	8.0		8.0	8.0		8.0	8.0	8.0	8.0	8.0	8.0
Flash Don't Walk (s)	11.0	11.0		11.0	11.0		16.0	16.0	16.0	16.0	16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	36.2			36.2			61.1	61.1	61.1	61.1	61.1	
Actuated g/C Ratio	0.33			0.33			0.56	0.56	0.56	0.56	0.56	
v/c Ratio	0.05			0.92	0.39		0.01	0.39	0.29	0.59	0.57	
Control Delay (s/veh)	16.0			62.7	5.1		12.5	16.0	2.4	23.8	19.4	
Queue Delay	0.0			0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay (s/veh)	16.0			62.7	5.1		12.5	16.0	2.4	23.8	19.4	
LOS	B			E	A		B	B	A	C	B	
Approach Delay (s/veh)	16.0				40.2			10.1			20.8	
Approach LOS	B				D			B			C	
Queue Length 50th (m)	1.8			85.2	0.4		0.3	47.8	0.0	42.4	87.7	
Queue Length 95th (m)	6.4			106.1	10.3		1.6	59.1	6.9	58.9	100.7	
Internal Link Dist (m)	32.6				222.0			711.7			453.2	
Turn Bay Length (m)				60.0			136.0		300.0	85.0		
Base Capacity (vph)	460			480	700		334	958	973	472	1034	
Starvation Cap Reductn	0			0	0		0	0	0	0	0	
Spillback Cap Reductn	0			0	0		0	0	0	0	0	
Storage Cap Reductn	0			0	0		0	0	0	0	0	
Reduced v/c Ratio	0.05			0.86	0.38		0.01	0.39	0.29	0.59	0.57	

Intersection Summary

Area Type:	Other
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 0 (0%), Referenced to phase 2:NBSB and 6:., Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay (s/veh): 23.5	Intersection LOS: C
Intersection Capacity Utilization 82.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Hwy 50 [Peel Regional Road 50] & Columbia Way



HCM Signalized Intersection Capacity Analysis (230561) 9408 Columbia
1: Hwy 50 [Peel Regional Road 50] & Columbia Way 2028 AM Total

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	6	3	9	325	2	206	2	292	227	221	466	0
Future Volume (vph)	6	3	9	325	2	206	2	292	227	221	466	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0		6.7	6.7	6.7	6.7	6.7	
Lane Util. Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt		0.94		1.00	0.85		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1400		1736	1500		1803	1727	1524	1656	1863	
Flt Permitted		0.90		0.74	1.00		0.32	1.00	1.00	0.49	1.00	
Satd. Flow (perm)		1278		1356	1500		603	1727	1524	851	1863	
Peak-hour factor, PHF	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Adj. Flow (vph)	8	4	11	411	3	261	3	370	287	280	590	0
RTOR Reduction (vph)	0	7	0	0	175	0	0	0	128	0	0	0
Lane Group Flow (vph)	0	16	0	411	89	0	3	370	159	280	590	0
Confl. Peds. (#/hr)							2					2
Heavy Vehicles (%)	20%	67%	13%	4%	0%	8%	0%	10%	6%	9%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			4			2		2		2
Permitted Phases	4			4			2		2			2
Actuated Green, G (s)		36.2		36.2	36.2		61.1	61.1	61.1	61.1	61.1	
Effective Green, g (s)		36.2		36.2	36.2		61.1	61.1	61.1	61.1	61.1	
Actuated g/C Ratio		0.33		0.33	0.33		0.56	0.56	0.56	0.56	0.56	
Clearance Time (s)		6.0		6.0	6.0		6.7	6.7	6.7	6.7	6.7	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		420		446	493		334	959	846	472	1034	
v/s Ratio Prot					0.06			0.21		0.33		0.32
v/s Ratio Perm		0.01		0.30			0.00		0.10	0.33		
v/c Ratio		0.04		0.92	0.18		0.01	0.39	0.19	0.59		0.57
Uniform Delay, d1		25.1		35.5	26.3		10.9	13.8	12.1	16.2		15.9
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2		0.0		24.4	0.2		0.0	1.2	0.5	5.4		2.3
Delay (s)		25.1		60.0	26.5		11.0	15.0	12.6	21.6		18.2
Level of Service		C		E	C		B	B	B	C		B
Approach Delay (s/veh)		25.1			46.9			14.0				19.3
Approach LOS		C			D			B				B
Intersection Summary												
HCM 2000 Control Delay (s/veh)		26.1										C
HCM 2000 Volume to Capacity ratio		0.71										
Actuated Cycle Length (s)		110.0							12.7			
Intersection Capacity Utilization		82.0%										E
Analysis Period (min)		15										
c Critical Lane Group												

Lanes, Volumes, Timings (230561) 9408 Columbia
2: Kingsview Drive & Columbia Way 2028 AM Total

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↔	↔	↔
Traffic Volume (vph)	391	50	105	389	60	82
Future Volume (vph)	391	50	105	389	60	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00			1.00	0.96	
Frt	0.985				0.922	
Flt Protected				0.989	0.979	
Satd. Flow (prot)	1719	0	0	1790	1598	0
Flt Permitted				0.663	0.979	
Satd. Flow (perm)	1719	0	0	1199	1562	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	13				63	
Link Speed (k/h)	50			50	50	
Link Distance (m)	246.0			351.6	165.2	
Travel Time (s)	17.7			25.3	11.9	
Confl. Peds. (#/hr)		2	2		16	6
Peak Hour Factor	0.67	0.67	0.67	0.67	0.67	0.67
Heavy Vehicles (%)	8%	13%	5%	5%	6%	4%
Adj. Flow (vph)	584	75	157	581	90	122
Shared Lane Traffic (%)						
Lane Group Flow (vph)	659	0	0	738	212	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15		25	25	15
Turn Type	NA		Perm	NA	Prot	
Protected Phases	2			6	4	
Permitted Phases			6			
Detector Phase	2		6	6	4	
Switch Phase						
Minimum Initial (s)	8.0		8.0	8.0	8.0	
Minimum Split (s)	70.0		70.0	70.0	30.0	
Total Split (s)	70.0		70.0	70.0	30.0	
Total Split (%)	70.0%		70.0%	70.0%	30.0%	
Maximum Green (s)	64.0		64.0	64.0	23.1	
Yellow Time (s)	4.0		4.0	4.0	4.0	
All-Red Time (s)	2.0		2.0	2.0	2.9	
Lost Time Adjust (s)	0.0			0.0	0.0	
Total Lost Time (s)	6.0			6.0	6.9	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	C-Max		C-Max	C-Max	None	
Walk Time (s)	8.0		8.0	8.0	8.0	

Lanes, Volumes, Timings
2: Kingsview Drive & Columbia Way

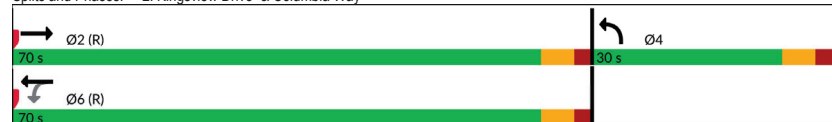
(230561) 9408 Columbia
2028 AM Total

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Flash Don't Walk (s)	7.0		7.0	7.0	7.0	
Pedestrian Calls (#/hr)	0		0	0	0	
Act Effct Green (s)	72.1		72.1	15.0		
Actuated g/C Ratio	0.72		0.72	0.15		
v/c Ratio	0.53		0.85	0.73		
Control Delay (s/veh)	8.9		24.1	41.8		
Queue Delay	0.0		0.0	0.0		
Total Delay (s/veh)	8.9		24.1	41.8		
LOS	A		C	D		
Approach Delay (s/veh)	8.9		24.1	41.8		
Approach LOS	A		C	D		
Queue Length 50th (m)	50.8		93.6	29.2		
Queue Length 95th (m)	59.3		99.1	32.2		
Internal Link Dist (m)	222.0		327.6	141.2		
Turn Bay Length (m)						
Base Capacity (vph)	1243		864	417		
Starvation Cap Reductn	0		0	0		
Spillback Cap Reductn	0		0	0		
Storage Cap Reductn	0		0	0		
Reduced v/c Ratio	0.53		0.85	0.51		

Intersection Summary

Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay (s/veh): 20.2 Intersection LOS: C
Intersection Capacity Utilization 75.1% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 2: Kingsview Drive & Columbia Way



HCM Signalized Intersection Capacity Analysis
2: Kingsview Drive & Columbia Way

(230561) 9408 Columbia
2028 AM Total

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↘			↗	↖	↗
Traffic Volume (vph)	391	50	105	389	60	82
Future Volume (vph)	391	50	105	389	60	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.0	6.9	
Lane Util. Factor	1.00			1.00	1.00	
Frpb, ped/bikes	1.00			1.00	0.98	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.98			1.00	0.92	
Flt Protected	1.00			0.99	0.98	
Satd. Flow (prot)	1718			1790	1599	
Flt Permitted	1.00			0.66	0.98	
Satd. Flow (perm)	1718			1200	1599	
Peak-hour factor, PHF	0.67	0.67	0.67	0.67	0.67	0.67
Adj. Flow (vph)	584	75	157	581	90	122
RTOR Reduction (vph)	4	0	0	0	54	0
Lane Group Flow (vph)	655	0	0	738	158	0
Confl. Peds. (#/hr)	2	2		2	16	6
Heavy Vehicles (%)	8%	13%	5%	5%	6%	4%
Turn Type	NA		Perm	NA	Prot	
Protected Phases	2			6	4	
Permitted Phases			6			
Actuated Green, G (s)	72.1			72.1	15.0	
Effective Green, g (s)	72.1			72.1	15.0	
Actuated g/C Ratio	0.72			0.72	0.15	
Clearance Time (s)	6.0			6.0	6.9	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	1238			865	239	
v/s Ratio Prot	0.38				c0.10	
v/s Ratio Perm				c0.62		
v/c Ratio	0.53			0.85	0.66	
Uniform Delay, d1	6.3			10.1	40.1	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	1.6			10.4	6.8	
Delay (s)	7.9			20.6	46.9	
Level of Service	A			C	D	
Approach Delay (s/veh)	7.9			20.6	46.9	
Approach LOS	A			C	D	

Intersection Summary

HCM 2000 Control Delay (s/veh) 18.8 HCM 2000 Level of Service B
HCM 2000 Volume to Capacity ratio 0.82
Actuated Cycle Length (s) 100.0 Sum of lost time (s) 12.9
Intersection Capacity Utilization 75.1% ICU Level of Service D
Analysis Period (min) 15
c Critical Lane Group

Lanes, Volumes, Timings (230561) 9408 Columbia
3: Westchester Road/Proposed North-South Street A & Columbia Way 2028 AM Total

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	246	62	62	299	24	95	0	71	146	0	60
Future Volume (vph)	18	246	62	62	299	24	95	0	71	146	0	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.974			0.994			0.942			0.961	
Flt Protected		0.998			0.992			0.972			0.966	
Satd. Flow (prot)	0	1729	0	0	1819	0	0	1644	0	0	1729	0
Flt Permitted		0.998			0.992			0.972			0.966	
Satd. Flow (perm)	0	1729	0	0	1819	0	0	1644	0	0	1729	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		570.4			296.2			121.1			116.7	
Travel Time (s)		41.1			21.3			8.7			8.4	
Confl. Peds. (#/hr)			3	3								
Peak Hour Factor	0.92	0.65	0.65	0.65	0.65	0.92	0.65	0.92	0.65	0.92	0.92	0.92
Heavy Vehicles (%)	2%	7%	7%	8%	2%	2%	2%	2%	11%	2%	2%	2%
Adj. Flow (vph)	20	378	95	95	460	26	146	0	109	159	0	65
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	493	0	0	581	0	0	255	0	0	224	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	61.5%											
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis (230561) 9408 Columbia
3: Westchester Road/Proposed North-South Street A & Columbia Way 2028 AM Total

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	246	62	62	299	24	95	0	71	146	0	60
Future Volume (Veh/h)	18	246	62	62	299	24	95	0	71	146	0	60
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.65	0.65	0.65	0.65	0.92	0.65	0.92	0.65	0.92	0.92	0.92
Hourly flow rate (vph)	20	378	95	95	460	26	146	0	109	159	0	65
Pedestrians								3				
Lane Width (m)								3.6				
Walking Speed (m/s)								1.2				
Percent Blockage								0				
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	486			476			1197	1145	429	1238	1179	473
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	486			476			1197	1145	429	1238	1179	473
tC, single (s)	4.1			4.2			7.1	6.5	6.3	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.0	3.4	3.5	4.0	3.3
p0 queue free %	98			91			0	100	82	0	100	89
cM capacity (veh/h)	1077			1053			132	178	606	115	170	591
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	493	581	255	224								
Volume Left	20	95	146	159								
Volume Right	95	26	109	65								
cSH	1077	1053	199	150								
Volume to Capacity	0.02	0.09	1.28	1.50								
Queue Length 95th (m)	0.5	2.4	111.2	119.4								
Control Delay (s/veh)	0.5	2.4	206.9	310.1								
Lane LOS	A	A	F	F								
Approach Delay (s/veh)	0.5	2.4	206.9	310.1								
Approach LOS		F	F									
Intersection Summary												
Average Delay		79.8										
Intersection Capacity Utilization		61.5%										
Analysis Period (min)		15										

Lanes, Volumes, Timings
4: Mount Hope Road & Columbia Way

(230561) 9408 Columbia
2028 AM Total

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	354	19	1	240	25	59	9	23	158	4	94
Future Volume (vph)	83	354	19	1	240	25	59	9	23	158	4	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.994			0.987			0.966			0.951	
Flt Protected		0.991						0.968			0.970	
Satd. Flow (prot)	0	1741	0	0	1842	0	0	1653	0	0	1577	0
Flt Permitted		0.991						0.968			0.970	
Satd. Flow (perm)	0	1741	0	0	1842	0	0	1653	0	0	1577	0
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		296.2			237.5			421.4			267.1	
Travel Time (s)		17.8			14.3			30.3			16.0	
Confl. Peds. (#/hr)			6	6					2	2		
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
Heavy Vehicles (%)	17%	5%	13%	0%	2%	0%	3%	13%	17%	14%	20%	6%
Adj. Flow (vph)	120	513	28	1	348	36	86	13	33	229	6	136
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	661	0	0	385	0	0	132	0	0	371	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization 65.6%	ICU Level of Service C
Analysis Period (min) 15	

HCM Unsignalized Intersection Capacity Analysis
4: Mount Hope Road & Columbia Way

(230561) 9408 Columbia
2028 AM Total

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	354	19	1	240	25	59	9	23	158	4	94
Future Volume (Veh/h)	83	354	19	1	240	25	59	9	23	158	4	94
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
Hourly flow rate (vph)	120	513	28	1	348	36	86	13	33	229	6	136
Pedestrians					2			6				
Lane Width (m)					3.6			3.6				
Walking Speed (m/s)					1.2			1.2				
Percent Blockage					0			1				
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	384			547			1280	1159	535	1177	1155	366
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	384			547			1280	1159	535	1177	1155	366
tC, single (s)	4.3			4.1			7.1	6.6	6.4	7.2	6.7	6.3
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.1	3.5	3.6	4.2	3.4
p0 queue free %	89			100			14	92	94	0	96	80
cM capacity (veh/h)	1097			1027			100	165	514	128	161	670

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	661	385	132	371
Volume Left	120	1	86	229
Volume Right	28	36	33	136
cSH	1097	1027	131	182
Volume to Capacity	0.11	0.00	1.00	2.04
Queue Length 95th (m)	2.9	0.0	56.6	227.8
Control Delay (s/veh)	2.7	0.0	144.6	526.9
Lane LOS	A	A	F	F
Approach Delay (s/veh)	2.7	0.0	144.6	526.9
Approach LOS		F	F	

Intersection Summary			
Average Delay	139.7		
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

Lanes, Volumes, Timings

5: Caledon-King Townline South & Columbia Way

(230561) 9408 Columbia

2028 AM Total

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	57	517	135	128	586	52
Future Volume (vph)	57	517	135	128	586	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.878				0.989	
Flt Protected	0.995			0.975		
Satd. Flow (prot)	1616	0	0	1781	1850	0
Flt Permitted	0.995			0.975		
Satd. Flow (perm)	1616	0	0	1781	1850	0
Link Speed (k/h)	60			60	60	
Link Distance (m)	504.6			1060.6	1231.4	
Travel Time (s)	30.3			63.6	73.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	3%	4%	4%	1%	8%
Adj. Flow (vph)	62	562	147	139	637	57
Shared Lane Traffic (%)						
Lane Group Flow (vph)	624	0	0	286	694	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	93.3%			ICU Level of Service F		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

5: Caledon-King Townline South & Columbia Way

(230561) 9408 Columbia

2028 AM Total

	EBL	EBR	NBL	NBT	SBT	SBR
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Volume (veh/h)	57	517	135	128	586	52
Future Volume (Veh/h)	57	517	135	128	586	52
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	62	562	147	139	637	57
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	1099	666	694			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1099	666	694			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	69	0	84			
cM capacity (veh/h)	198	458	892			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	624	286	694			
Volume Left	62	147	0			
Volume Right	562	0	57			
cSH	405	892	1700			
Volume to Capacity	1.54	0.16	0.41			
Queue Length 95th (m)	273.5	4.7	0.0			
Control Delay (s/veh)	280.0	5.9	0.0			
Lane LOS	F	A				
Approach Delay (s/veh)	280.0	5.9	0.0			
Approach LOS	F					
Intersection Summary						
Average Delay		110.0				
Intersection Capacity Utilization		93.3%		ICU Level of Service	F	
Analysis Period (min)		15				

Lanes, Volumes, Timings
6: Mount Hope Road & Proposed East-West Street C

(230561) 9408 Columbia
2028 AM Total

	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Volume (vph)	11	37	8	71	174	37
Future Volume (vph)	11	37	8	71	174	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.896				0.976	
Flt Protected	0.989			0.995		
Satd. Flow (prot)	1651	0	0	1853	1818	0
Flt Permitted	0.989			0.995		
Satd. Flow (perm)	1651	0	0	1853	1818	0
Link Speed (k/h)	50			60	60	
Link Distance (m)	124.1			186.7	270.8	
Travel Time (s)	8.9			11.2	16.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	40	9	77	189	40
Shared Lane Traffic (%)						
Lane Group Flow (vph)	52	0	0	86	229	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 21.4%	ICU Level of Service A					
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis
6: Mount Hope Road & Proposed East-West Street C

(230561) 9408 Columbia
2028 AM Total

	EBL	EBR	NBL	NBT	SBT	SBR
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Volume (veh/h)	11	37	8	71	174	37
Future Volume (Veh/h)	11	37	8	71	174	37
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	40	9	77	189	40
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	304	209	229			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	304	209	229			
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	99			
cM capacity (veh/h)	683	831	1339			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	52	86	229			
Volume Left	12	9	0			
Volume Right	40	0	40			
cSH	792	1339	1700			
Volume to Capacity	0.07	0.01	0.13			
Queue Length 95th (m)	1.7	0.2	0.0			
Control Delay (s/veh)	9.9	0.9	0.0			
Lane LOS	A	A				
Approach Delay (s/veh)	9.9	0.9	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		1.6				
Intersection Capacity Utilization		21.4%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings

7: Mount Hope Road & Proposed East-West Street B

(230561) 9408 Columbia

2028 AM Total

	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Volume (vph)	11	108	69	68	164	47
Future Volume (vph)	11	108	69	68	164	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.878				0.970	
Flt Protected	0.995			0.975		
Satd. Flow (prot)	1627	0	0	1816	1807	0
Flt Permitted	0.995			0.975		
Satd. Flow (perm)	1627	0	0	1816	1807	0
Link Speed (k/h)	50			60	60	
Link Distance (m)	134.0			267.1	186.7	
Travel Time (s)	9.6			16.0	11.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	117	75	74	178	51
Shared Lane Traffic (%)						
Lane Group Flow (vph)	129	0	0	149	229	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 36.2%	ICU Level of Service A					
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis

7: Mount Hope Road & Proposed East-West Street B

(230561) 9408 Columbia

2028 AM Total

	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Volume (veh/h)	11	108	69	68	164	47
Future Volume (Veh/h)	11	108	69	68	164	47
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	117	75	74	178	51
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	428	204	229			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	428	204	229			
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	86	94			
cM capacity (veh/h)	551	837	1339			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	129	149	229			
Volume Left	12	75	0			
Volume Right	117	0	51			
cSH	799	1339	1700			
Volume to Capacity	0.16	0.06	0.13			
Queue Length 95th (m)	4.6	1.4	0.0			
Control Delay (s/veh)	10.4	4.2	0.0			
Lane LOS	B	A				
Approach Delay (s/veh)	10.4	4.2	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay		3.9				
Intersection Capacity Utilization		36.2%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings (230561) 9408 Columbia
8: Mount Hope Road & Castlederg Side Road 2028 AM Total

	↖	→	↘	↙	←	↖	↙	↗	↘	↖	↘	↗
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	9	170	55	25	197	3	13	53	17	23	132	34
Future Volume (vph)	9	170	55	25	197	3	13	53	17	23	132	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.968			0.998			0.972			0.976	
Flt Protected		0.998			0.994			0.992			0.994	
Satd. Flow (prot)	0	1669	0	0	1828	0	0	1571	0	0	1772	0
Flt Permitted		0.998			0.994			0.992			0.994	
Satd. Flow (perm)	0	1669	0	0	1828	0	0	1571	0	0	1772	0
Link Speed (k/h)		70			70			60			60	
Link Distance (m)		528.0			555.3			2188.9			634.1	
Travel Time (s)		27.2			28.6			131.3			38.0	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	13%	5%	25%	12%	2%	0%	25%	12%	25%	0%	5%	3%
Adj. Flow (vph)	11	202	65	30	235	4	15	63	20	27	157	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	278	0	0	269	0	0	98	0	0	224	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	40.4%											
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis (230561) 9408 Columbia
8: Mount Hope Road & Castlederg Side Road 2028 AM Total

	↖	→	↘	↙	←	↖	↙	↗	↘	↖	↘	↗
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	9	170	55	25	197	3	13	53	17	23	132	34
Future Volume (vph)	9	170	55	25	197	3	13	53	17	23	132	34
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	11	202	65	30	235	4	15	63	20	27	157	40
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	278	269	98	224								
Volume Left (vph)	11	30	15	27								
Volume Right (vph)	65	4	20	40								
Hadj (s)	0.04	0.07	0.19	-0.01								
Departure Headway (s)	5.3	5.4	6.0	5.6								
Degree Utilization, x	0.41	0.40	0.16	0.35								
Capacity (veh/h)	633	629	519	592								
Control Delay (s/veh)	12.0	11.9	10.2	11.5								
Approach Delay (s/veh)	12.0	11.9	10.2	11.5								
Approach LOS	B	B	B	B								
Intersection Summary												
Delay	11.6											
Level of Service	B											
Intersection Capacity Utilization	40.4%											
Analysis Period (min)	15											

Lanes, Volumes, Timings

9: Forest Gate Avenue & Columbia Way

(230561) 9408 Columbia

2028 AM Total

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↗	
Traffic Volume (vph)	432	27	21	121	79	91
Future Volume (vph)	432	27	21	121	79	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.992				0.928	
Flt Protected				0.993	0.977	
Satd. Flow (prot)	1794	0	0	1782	1690	0
Flt Permitted				0.993	0.977	
Satd. Flow (perm)	1794	0	0	1782	1690	0
Link Speed (k/h)	60			60	50	
Link Distance (m)	237.5			314.7	240.6	
Travel Time (s)	14.3			18.9	17.3	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles (%)	4%	22%	5%	6%	3%	1%
Adj. Flow (vph)	502	31	24	141	92	106
Shared Lane Traffic (%)						
Lane Group Flow (vph)	533	0	0	165	198	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		100	100		100	100
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	41.0%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

9: Forest Gate Avenue & Columbia Way

(230561) 9408 Columbia

2028 AM Total

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↗	↖
Traffic Volume (veh/h)	432	27	21	121	79	91
Future Volume (Veh/h)	432	27	21	121	79	91
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	502	31	24	141	92	106
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			533		707	518
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			533		707	518
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		76	81
cM capacity (veh/h)			1020		391	560
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	533	165	198			
Volume Left	0	24	92			
Volume Right	31	0	106			
cSH	1700	1020	466			
Volume to Capacity	0.31	0.02	0.42			
Queue Length 95th (m)	0.0	0.6	16.7			
Control Delay (s/veh)	0.0	1.4	18.3			
Lane LOS		A	C			
Approach Delay (s/veh)	0.0	1.4	18.3			
Approach LOS			C			
Intersection Summary						
Average Delay			4.3			
Intersection Capacity Utilization		41.0%		ICU Level of Service		A
Analysis Period (min)			15			

Lanes, Volumes, Timings (230561) 9408 Columbia
10: Mount Hope Road & Mount Hope Road & Proposed East-West Street L North 028 AM Total

	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Volume (vph)	0	2	0	99	239	1
Future Volume (vph)	0	2	0	99	239	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.865			0.999		
Flt Protected						
Satd. Flow (prot)	1611	0	0	1863	1861	0
Flt Permitted						
Satd. Flow (perm)	1611	0	0	1863	1861	0
Link Speed (k/h)	50			60	60	
Link Distance (m)	89.2			169.0	2188.9	
Travel Time (s)	6.4			10.1	131.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2	0	108	260	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	0	0	108	261	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 22.6%	ICU Level of Service A					
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis (230561) 9408 Columbia
10: Mount Hope Road & Mount Hope Road & Proposed East-West Street L North 028 AM Total

	EBL	EBR	NBL	NBT	SBT	SBR
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Volume (veh/h)	0	2	0	99	239	1
Future Volume (Veh/h)	0	2	0	99	239	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	2	0	108	260	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	369	261	261			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	369	261	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 %	100	100	100			
cM capacity (veh/h)	632	778	1303			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	2	108	261			
Volume Left	0	0	0			
Volume Right	2	0	1			
cSH	778	1303	1700			
Volume to Capacity	0.00	0.00	0.15			
Queue Length 95th (m)	0.1	0.0	0.0			
Control Delay (s/veh)	9.6	0.0	0.0			
Lane LOS	A					
Approach Delay (s/veh)	9.6	0.0	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		0.1				
Intersection Capacity Utilization		22.6%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings (230561) 9408 Columbia
11: Mount Hope Road & Mount Hope Road & Proposed East-West Street L South 2028 AM Total

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	0	14	7	83	212	0
Future Volume (vph)	0	14	7	83	212	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.865					
Flt Protected				0.996		
Satd. Flow (prot)	1611	0	0	1855	1863	0
Flt Permitted				0.996		
Satd. Flow (perm)	1611	0	0	1855	1863	0
Link Speed (k/h)	50			60	60	
Link Distance (m)	77.5			270.8	169.0	
Travel Time (s)	5.6			16.2	10.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	15	8	90	230	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	15	0	0	98	230	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	21.2%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis (230561) 9408 Columbia
11: Mount Hope Road & Mount Hope Road & Proposed East-West Street L South 2028 AM Total

	EBL	EBR	NBL	NBT	SBT	SBR
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Volume (veh/h)	0	14	7	83	212	0
Future Volume (Veh/h)	0	14	7	83	212	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	15	8	90	230	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	336	230	230			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	336	230	230			
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	98	99			
cM capacity (veh/h)	655	809	1338			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	15	98	230			
Volume Left	0	8	0			
Volume Right	15	0	0			
cSH	809	1338	1700			
Volume to Capacity	0.02	0.01	0.14			
Queue Length 95th (m)	0.5	0.1	0.0			
Control Delay (s/veh)	9.5	0.7	0.0			
Lane LOS	A	A				
Approach Delay (s/veh)	9.5	0.7	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		0.6				
Intersection Capacity Utilization		21.2%		ICU Level of Service	A	
Analysis Period (min)		15				

Measures of Effectiveness

(230561) 9408 Columbia
2028 AM Total

Network Totals

Number of Intersections	11
Total Delay (hr)	135
Stops (#)	4689
Average Speed (km/hr)	24
Total Travel Time (hr)	233
Distance Traveled (km)	5547
Fuel Consumed (l)	1002
Fuel Economy (km/l)	5.5
Unserviced Vehicles (#)	0
Vehicles in dilemma zone (#)	0
Performance Index	148.4

Lanes, Volumes, Timings

1: Hwy 50 [Peel Regional Road 50] & Columbia Way

(230561) 9408 Columbia
2028 PM Total

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	1	214	0	105	1	607	246	192	385	2
Future Volume (vph)	2	0	1	214	0	105	1	607	246	192	385	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	60.0		0.0	136.0		300.0	85.0		25.0
Storage Lanes	0		0	1		0	1		0	1		1
Taper Length (m)	7.5			60.0			45.0			90.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					0.98							
Frt		0.955			0.850				0.850			0.850
Flt Protected		0.968		0.950			0.950			0.950		
Satd. Flow (prot)	0	1756	0	1787	1535	0	902	1863	1599	1770	1845	808
Flt Permitted		0.889		0.756			0.500			0.347		
Satd. Flow (perm)	0	1613	0	1422	1535	0	475	1863	1599	646	1845	808
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		40			255				259			33
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		56.6			246.0			735.7			477.2	
Travel Time (s)		4.1			17.7			53.0			34.4	
Confl. Bikes (#/hr)	1					1						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	1%	0%	3%	100%	2%	1%	2%	3%	100%
Adj. Flow (vph)	2	0	1	225	0	111	1	639	259	202	405	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	3	0	225	111	0	1	639	259	202	405	2
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2		2	2		2
Detector Phase	4	4		4	4		2	2	2	2	2	2
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		20.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	25.0	25.0		25.0	25.0		30.7	30.7	30.7	30.7	30.7	30.7
Total Split (s)	36.0	36.0		36.0	36.0		64.0	64.0	64.0	64.0	64.0	64.0
Total Split (%)	36.0%	36.0%		36.0%	36.0%		64.0%	64.0%	64.0%	64.0%	64.0%	64.0%
Maximum Green (s)	30.0	30.0		30.0	30.0		57.3	57.3	57.3	57.3	57.3	57.3
Yellow Time (s)	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		2.7	2.7	2.7	2.7	2.7	2.7
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0		6.0	6.0		6.7	6.7	6.7	6.7	6.7	6.7
Lead/Lag												
Lead-Lag Optimize?												

Lanes, Volumes, Timings (230561) 9408 Columbia
1: Hwy 50 [Peel Regional Road 50] & Columbia Way 2028 PM Total

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	8.0	8.0		8.0	8.0		8.0	8.0	8.0	8.0	8.0	8.0
Flash Don't Walk (s)	11.0	11.0		11.0	11.0		16.0	16.0	16.0	16.0	16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	21.0			21.0	21.0		66.3	66.3	66.3	66.3	66.3	66.3
Actuated g/C Ratio	0.21			0.21	0.21		0.66	0.66	0.66	0.66	0.66	0.66
v/c Ratio	0.01			0.75	0.21		0.00	0.52	0.23	0.47	0.33	0.00
Control Delay (s/veh)	0.0			52.2	0.9		8.0	11.6	1.6	14.5	9.2	0.0
Queue Delay	0.0			0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	0.0			52.2	0.9		8.0	11.6	1.6	14.5	9.2	0.0
LOS	A			D	A		A	B	A	B	A	A
Approach Delay (s/veh)				35.2			8.8			10.9		
Approach LOS				D			A			B		
Queue Length 50th (m)	0.0			43.3	0.0		0.1	60.1	0.0	18.2	32.1	0.0
Queue Length 95th (m)	0.0			63.8	0.0		0.8	110.4	10.0	46.5	60.9	0.0
Internal Link Dist (m)	32.6			222.0			711.7			453.2		
Turn Bay Length (m)				60.0			136.0		300.0	85.0		25.0
Base Capacity (vph)	511			426	639		314	1234	1146	427	1222	546
Starvation Cap Reductn	0			0	0		0	0	0	0	0	0
Spillback Cap Reductn	0			0	0		0	0	0	0	0	0
Storage Cap Reductn	0			0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.01			0.53	0.17		0.00	0.52	0.23	0.47	0.33	0.00

Intersection Summary

Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 15 (15%), Referenced to phase 2:NBSB and 6:, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay (s/veh): 14.3	Intersection LOS: B
Intersection Capacity Utilization 80.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 1: Hwy 50 [Peel Regional Road 50] & Columbia Way



HCM Signalized Intersection Capacity Analysis (230561) 9408 Columbia
1: Hwy 50 [Peel Regional Road 50] & Columbia Way 2028 PM Total

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	2	0	1	214	0	105	1	607	246	192	385	2
Future Volume (vph)	2	0	1	214	0	105	1	607	246	192	385	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.96	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.97	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1756	1787	1534	903	1863	1599	1770	1845	808			
Flt Permitted	0.89	0.76	1.00	0.50	1.00	1.00	0.35	1.00	1.00			
Satd. Flow (perm)	1613	1422	1534	475	1863	1599	646	1845	808			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2	0	1	225	0	111	1	639	259	202	405	2
RTOR Reduction (vph)	0	2	0	0	88	0	0	0	87	0	0	1
Lane Group Flow (vph)	0	1	0	225	23	0	1	639	172	202	405	1
Confl. Bikes (#/hr)	1					1						
Heavy Vehicles (%)	0%	0%	0%	1%	0%	3%	100%	2%	1%	2%	3%	100%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	4			4			2		2		2	
Permitted Phases	4			4			2		2		2	
Actuated Green, G (s)	21.0			21.0	21.0		66.3	66.3	66.3	66.3	66.3	66.3
Effective Green, g (s)	21.0			21.0	21.0		66.3	66.3	66.3	66.3	66.3	66.3
Actuated g/C Ratio	0.21			0.21	0.21		0.66	0.66	0.66	0.66	0.66	0.66
Clearance Time (s)	6.0			6.0	6.0		6.7	6.7	6.7	6.7	6.7	6.7
Vehicle Extension (s)	3.0			3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	338			298	322		314	1235	1060	428	1223	535
v/s Ratio Prot				0.02			c0.34				0.22	
v/s Ratio Perm	0.00			c0.16			0.00		0.11	0.31		0.00
v/c Ratio	0.00			0.76	0.07		0.00	0.52	0.16	0.47	0.33	0.00
Uniform Delay, d1	31.2			37.1	31.7		5.7	8.6	6.4	8.3	7.3	5.7
Progression Factor	1.00			1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0			10.4	0.1		0.0	1.6	0.3	3.7	0.7	0.0
Delay (s)	31.2			47.5	31.8		5.7	10.2	6.7	12.0	8.0	5.7
Level of Service	C			D	C		A	B	A	B	A	A
Approach Delay (s/veh)	31.2			42.3			9.2			9.3		
Approach LOS	C			D			A			A		

Intersection Summary

HCM 2000 Control Delay (s/veh)	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.7
Intersection Capacity Utilization	80.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lanes, Volumes, Timings
2: Kingsview Drive & Columbia Way

(230561) 9408 Columbia
2028 PM Total

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩			↩	↩	
Traffic Volume (vph)	301	91	60	267	39	40
Future Volume (vph)	301	91	60	267	39	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99			1.00		
Frt	0.969				0.931	
Flt Protected				0.991	0.976	
Satd. Flow (prot)	1796	0	0	1846	1726	0
Flt Permitted				0.869	0.976	
Satd. Flow (perm)	1796	0	0	1616	1726	0
Right Turn on Red	Yes					Yes
Satd. Flow (RTOR)	26				43	
Link Speed (k/h)	50			50	50	
Link Distance (m)	246.0			351.6	165.2	
Travel Time (s)	17.7			25.3	11.9	
Confl. Peds. (#/hr)		8	8			
Confl. Bikes (#/hr)		2	2			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	0%	2%	2%	0%	0%
Adj. Flow (vph)	320	97	64	284	41	43
Shared Lane Traffic (%)						
Lane Group Flow (vph)	417	0	0	348	84	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Turn Type	NA		Perm	NA	Prot	
Protected Phases	2			6	8	
Permitted Phases			6			
Detector Phase	2		6	6	8	
Switch Phase						
Minimum Initial (s)	8.0		8.0	8.0	8.0	
Minimum Split (s)	36.0		32.0	32.0	36.0	
Total Split (s)	36.0		32.0	32.0	36.0	
Total Split (%)	50.0%		44.4%	44.4%	50.0%	
Maximum Green (s)	30.0		25.1	25.1	30.0	
Yellow Time (s)	4.0		4.0	4.0	4.0	
All-Red Time (s)	2.0		2.9	2.9	2.0	
Lost Time Adjust (s)	0.0			0.0	0.0	
Total Lost Time (s)	6.0			6.9	6.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	C-Max		C-Max	C-Max	None	

Lanes, Volumes, Timings
2: Kingsview Drive & Columbia Way

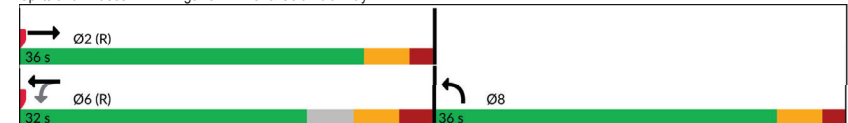
(230561) 9408 Columbia
2028 PM Total

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Walk Time (s)	8.0		8.0	8.0	8.0	
Flash Don't Walk (s)	7.0		7.0	7.0	7.0	
Pedestrian Calls (#/hr)	0		0	0	0	
Act Effct Green (s)	55.3			54.6	8.7	
Actuated g/C Ratio	0.77			0.76	0.12	
v/c Ratio	0.30			0.28	0.34	
Control Delay (s/veh)	4.1			4.7	20.6	
Queue Delay	0.0			0.0	0.0	
Total Delay (s/veh)	4.1			4.7	20.6	
LOS	A			A	C	
Approach Delay (s/veh)	4.1			4.7	20.6	
Approach LOS	A			A	C	
Queue Length 50th (m)	15.6			14.7	5.4	
Queue Length 95th (m)	30.7			29.1	17.1	
Internal Link Dist (m)	222.0			327.6	141.2	
Turn Bay Length (m)						
Base Capacity (vph)	1386			1225	744	
Starvation Cap Reductn	0			0	0	
Spillback Cap Reductn	0			0	0	
Storage Cap Reductn	0			0	0	
Reduced v/c Ratio	0.30			0.28	0.11	

Intersection Summary

Area Type: Other
 Cycle Length: 72
 Actuated Cycle Length: 72
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.34
 Intersection Signal Delay (s/veh): 6.0
 Intersection LOS: A
 Intersection Capacity Utilization 61.4%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 2: Kingsview Drive & Columbia Way



HCM Signalized Intersection Capacity Analysis
2: Kingsview Drive & Columbia Way

(230561) 9408 Columbia
2028 PM Total

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↱	
Traffic Volume (vph)	301	91	60	267	39	40
Future Volume (vph)	301	91	60	267	39	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.9	6.0	
Lane Util. Factor	1.00			1.00	1.00	
Frpb, ped/bikes	0.99			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.97			1.00	0.93	
Flt Protected	1.00			0.99	0.98	
Satd. Flow (prot)	1796			1842	1727	
Flt Permitted	1.00			0.87	0.98	
Satd. Flow (perm)	1796			1616	1727	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	320	97	64	284	41	43
RTOR Reduction (vph)	7	0	0	0	39	0
Lane Group Flow (vph)	410	0	0	348	45	0
Confl. Peds. (#/hr)		8	8			
Confl. Bikes (#/hr)		2	2			
Heavy Vehicles (%)	2%	0%	2%	2%	0%	0%
Turn Type	NA		Perm	NA	Prot	
Protected Phases	2			6	8	
Permitted Phases			6			
Actuated Green, G (s)	52.9			52.0	7.1	
Effective Green, g (s)	52.9			52.0	7.1	
Actuated g/C Ratio	0.73			0.72	0.10	
Clearance Time (s)	6.0			6.9	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	1319			1167	170	
v/s Ratio Prot	c0.23				c0.03	
v/s Ratio Perm				0.22		
v/c Ratio	0.31			0.30	0.27	
Uniform Delay, d1	3.3			3.5	30.0	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.6			0.7	0.8	
Delay (s)	3.9			4.2	30.9	
Level of Service	A			A	C	
Approach Delay (s/veh)	3.9			4.2	30.9	
Approach LOS	A			A	C	
Intersection Summary						
HCM 2000 Control Delay (s/veh)		6.7		HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio		0.31				
Actuated Cycle Length (s)		72.0		Sum of lost time (s)		12.9
Intersection Capacity Utilization		61.4%		ICU Level of Service		B
Analysis Period (min)		15				
c Critical Lane Group						

Lanes, Volumes, Timings

3: Westchester Road/Proposed North-South Street A & Columbia Way

(230561) 9408 Columbia
2028 PM Total

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰			↱			↱			↱	
Traffic Volume (vph)	93	185	69	48	175	208	49	0	37	86	0	101
Future Volume (vph)	93	185	69	48	175	208	49	0	37	86	0	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.973			0.935			0.942			0.927	
Flt Protected		0.987			0.994			0.972			0.978	
Satd. Flow (prot)	0	1798	0	0	1731	0	0	1666	0	0	1689	0
Flt Permitted		0.987			0.994			0.972			0.978	
Satd. Flow (perm)	0	1798	0	0	1731	0	0	1666	0	0	1689	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		570.4			296.2			121.1			116.7	
Travel Time (s)		41.1			21.3			8.7			8.4	
Confl. Peds. (#/hr)			6	6								
Peak Hour Factor	0.92	0.93	0.93	0.93	0.93	0.92	0.93	0.92	0.93	0.92	0.92	0.92
Heavy Vehicles (%)	2%	1%	2%	2%	2%	2%	4%	2%	5%	2%	2%	2%
Adj. Flow (vph)	101	199	74	52	188	226	53	0	40	93	0	110
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	374	0	0	466	0	0	93	0	0	203	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization 56.3%	ICU Level of Service B											
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis (230561) 9408 Columbia
3: Westchester Road/Proposed North-South Street A & Columbia Way 2028 PM Total

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	185	69	48	175	208	49	0	37	86	0	101
Future Volume (Veh/h)	93	185	69	48	175	208	49	0	37	86	0	101
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.93	0.93	0.93	0.93	0.92	0.93	0.92	0.93	0.92	0.92	0.92
Hourly flow rate (vph)	101	199	74	52	188	226	53	0	40	93	0	110
Pedestrians								6				
Lane Width (m)								3.6				
Walking Speed (m/s)								1.2				
Percent Blockage								1				
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	414			279			959	962	242	883	886	301
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	414			279			959	962	242	883	886	301
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 %	91			96			70	100	95	59	100	85
cM capacity (veh/h)	1145			1277			179	223	786	228	247	739
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	374	466	93	203								
Volume Left	101	52	53	93								
Volume Right	74	226	40	110								
cSH	1145	1277	268	364								
Volume to Capacity	0.09	0.04	0.35	0.56								
Queue Length 95th (m)	2.3	1.0	11.9	26.0								
Control Delay (s/veh)	2.9	1.3	25.4	26.6								
Lane LOS	A	A	D	D								
Approach Delay (s/veh)	2.9	1.3	25.4	26.6								
Approach LOS			D	D								
Intersection Summary												
Average Delay	8.3											
Intersection Capacity Utilization	56.3%			ICU Level of Service			B					
Analysis Period (min)	15											

Lanes, Volumes, Timings (230561) 9408 Columbia
4: Mount Hope Road & Columbia Way 2028 PM Total

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	217	45	18	347	167	21	6	10	42	8	51
Future Volume (vph)	63	217	45	18	347	167	21	6	10	42	8	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.981			0.958			0.962			0.932	
Flt Protected		0.990			0.998			0.973			0.980	
Satd. Flow (prot)	0	1778	0	0	1793	0	0	1725	0	0	1674	0
Flt Permitted		0.990			0.998			0.973			0.980	
Satd. Flow (perm)	0	1778	0	0	1793	0	0	1725	0	0	1674	0
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		296.2			237.5			421.4			267.1	
Travel Time (s)		17.8			14.3			30.3			16.0	
Confl. Peds. (#/hr)			11	11								
Confl. Bikes (#/hr)			1	1								
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	3%	4%	4%	0%	2%	0%	0%	20%	0%	0%	8%	6%
Adj. Flow (vph)	67	231	48	19	369	178	22	6	11	45	9	54
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	346	0	0	566	0	0	39	0	0	108	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type: Unsignalized												
Intersection Capacity Utilization 57.5% ICU Level of Service B												
Analysis Period (min) 15												

HCM Unsignalized Intersection Capacity Analysis
4: Mount Hope Road & Columbia Way

(230561) 9408 Columbia
2028 PM Total

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	217	45	18	347	167	21	6	10	42	8	51
Future Volume (Veh/h)	63	217	45	18	347	167	21	6	10	42	8	51
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	67	231	48	19	369	178	22	6	11	45	9	54
Pedestrians								11				
Lane Width (m)								3.6				
Walking Speed (m/s)								1.2				
Percent Blockage								1				
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	547			290			955	985	266	899	920	458
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	547			290			955	985	266	899	920	458
tC, single (s)	4.1			4.1			7.1	6.7	6.2	7.1	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.2	3.3	3.5	4.1	3.4
p0 queue free %	93			99			89	97	99	81	96	91
cM capacity (veh/h)	1017			1272			196	211	770	236	241	595
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	346	566	39	108								
Volume Left	67	19	22	45								
Volume Right	48	178	11	54								
cSH	1017	1272	252	338								
Volume to Capacity	0.07	0.01	0.15	0.32								
Queue Length 95th (m)	1.7	0.4	4.3	10.7								
Control Delay (s/veh)	2.3	0.4	21.9	20.5								
Lane LOS	A	A	C	C								
Approach Delay (s/veh)	2.3	0.4	21.9	20.5								
Approach LOS			C	C								
Intersection Summary												
Average Delay				3.9								
Intersection Capacity Utilization				57.5%	ICU Level of Service			B				
Analysis Period (min)				15								

Lanes, Volumes, Timings

5: Caledon-King Townline South & Columbia Way

(230561) 9408 Columbia
2028 PM Total

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	100	118	178	502	294	370
Future Volume (vph)	100	118	178	502	294	370
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.927				0.925	
Flt Protected	0.978			0.987		
Satd. Flow (prot)	1616	0	0	1862	1734	0
Flt Permitted	0.978			0.987		
Satd. Flow (perm)	1616	0	0	1862	1734	0
Link Speed (k/h)	60			60	60	
Link Distance (m)	504.6			1060.6	1231.4	
Travel Time (s)	30.3			63.6	73.9	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	12%	2%	0%	1%	3%	0%
Adj. Flow (vph)	104	123	185	523	306	385
Shared Lane Traffic (%)						
Lane Group Flow (vph)	227	0	0	708	691	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 97.2%	ICU Level of Service F					
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis
5: Caledon-King Townline South & Columbia Way

(230561) 9408 Columbia
2028 PM Total

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	100	118	178	502	294	370
Future Volume (Veh/h)	100	118	178	502	294	370
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	104	123	185	523	306	385
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	1392	499	691			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1392	499	691			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	12	78	80			
cM capacity (veh/h)	119	572	913			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	227	708	691			
Volume Left	104	185	0			
Volume Right	123	0	385			
cSH	208	913	1700			
Volume to Capacity	1.09	0.20	0.41			
Queue Length 95th (m)	83.9	6.0	0.0			
Control Delay (s/veh)	137.3	4.7	0.0			
Lane LOS	F	A				
Approach Delay (s/veh)	137.3	4.7	0.0			
Approach LOS	F					
Intersection Summary						
Average Delay		21.2				
Intersection Capacity Utilization		97.2%		ICU Level of Service	F	
Analysis Period (min)		15				

Lanes, Volumes, Timings
6: Mount Hope Road & Proposed East-West Street C

(230561) 9408 Columbia
2028 PM Total

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	108	24	43	170	89	21
Future Volume (vph)	108	24	43	170	89	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.975				0.974	
Flt Protected	0.961			0.990		
Satd. Flow (prot)	1745	0	0	1844	1814	0
Flt Permitted	0.961			0.990		
Satd. Flow (perm)	1745	0	0	1844	1814	0
Link Speed (k/h)	50			60	60	
Link Distance (m)	124.1			186.7	270.8	
Travel Time (s)	8.9			11.2	16.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	117	26	47	185	97	23
Shared Lane Traffic (%)						
Lane Group Flow (vph)	143	0	0	232	120	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 32.1%	ICU Level of Service A					
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis (230561) 9408 Columbia
6: Mount Hope Road & Proposed East-West Street C 2028 PM Total

	EBL	EBR	NBL	NBT	SBT	SBR
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Volume (veh/h)	108	24	43	170	89	21
Future Volume (Veh/h)	108	24	43	170	89	21
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	117	26	47	185	97	23
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	388	109	120			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	388	109	120			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	80	97	97			
cM capacity (veh/h)	596	945	1468			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	143	232	120			
Volume Left	117	47	0			
Volume Right	26	0	23			
cSH	639	1468	1700			
Volume to Capacity	0.22	0.03	0.07			
Queue Length 95th (m)	6.8	0.8	0.0			
Control Delay (s/veh)	12.2	1.7	0.0			
Lane LOS	B	A				
Approach Delay (s/veh)	12.2	1.7	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay		4.4				
Intersection Capacity Utilization		32.1%		ICU Level of Service	A	
Analysis Period (min)		15				

Lanes, Volumes, Timings (230561) 9408 Columbia
7: Mount Hope Road & Proposed East-West Street B 2028 PM Total

	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Volume (vph)	96	24	119	117	77	36
Future Volume (vph)	96	24	119	117	77	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.973				0.957	
Flt Protected	0.962			0.975		
Satd. Flow (prot)	1744	0	0	1816	1783	0
Flt Permitted	0.962			0.975		
Satd. Flow (perm)	1744	0	0	1816	1783	0
Link Speed (k/h)	50			60	60	
Link Distance (m)	134.0			267.1	186.7	
Travel Time (s)	9.6			16.0	11.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	104	26	129	127	84	39
Shared Lane Traffic (%)						
Lane Group Flow (vph)	130	0	0	256	123	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 32.9%	ICU Level of Service A					
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis (230561) 9408 Columbia
7: Mount Hope Road & Proposed East-West Street B 2028 PM Total

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			U	U	
Traffic Volume (veh/h)	96	24	119	117	77	36
Future Volume (Veh/h)	96	24	119	117	77	36
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	104	26	129	127	84	39
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	489	104	123			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	489	104	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 %	79	97	91			
cM capacity (veh/h)	491	951	1464			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	130	256	123			
Volume Left	104	129	0			
Volume Right	26	0	39			
cSH	544	1464	1700			
Volume to Capacity	0.24	0.09	0.07			
Queue Length 95th (m)	7.4	2.3	0.0			
Control Delay (s/veh)	13.7	4.2	0.0			
Lane LOS	B	A				
Approach Delay (s/veh)	13.7	4.2	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay		5.6				
Intersection Capacity Utilization		32.9%		ICU Level of Service	A	
Analysis Period (min)		15				

Lanes, Volumes, Timings (230561) 9408 Columbia
8: Mount Hope Road & Castleberg Side Road 2028 PM Total

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	315	25	25	219	26	68	184	15	20	51	9
Future Volume (vph)	63	315	25	25	219	26	68	184	15	20	51	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992			0.987			0.992			0.984	
Flt Protected		0.992			0.995			0.987			0.988	
Satd. Flow (prot)	0	1839	0	0	1726	0	0	1763	0	0	1776	0
Flt Permitted		0.992			0.995			0.987			0.988	
Satd. Flow (perm)	0	1839	0	0	1726	0	0	1763	0	0	1776	0
Link Speed (k/h)		70			70			60			60	
Link Distance (m)		528.0			555.3			2188.9			634.1	
Travel Time (s)		27.2			28.6			131.3			38.0	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	1%	14%	9%	9%	0%	0%	8%	0%	6%	4%	0%
Adj. Flow (vph)	67	335	27	27	233	28	72	196	16	21	54	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	429	0	0	288	0	0	284	0	0	85	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	60.0%				ICU Level of Service B							
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis (230561) 9408 Columbia
8: Mount Hope Road & Castlederg Side Road 2028 PM Total

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	63	315	25	25	219	26	68	184	15	20	51	9
Future Volume (vph)	63	315	25	25	219	26	68	184	15	20	51	9
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	67	335	27	27	233	28	72	196	16	21	54	10
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	429	288	284	85								
Volume Left (vph)	67	27	72	21								
Volume Right (vph)	27	28	16	10								
Hadj (s)	0.02	0.10	0.11	0.05								
Departure Headway (s)	5.7	6.0	6.3	6.8								
Degree Utilization, x	0.68	0.48	0.50	0.16								
Capacity (veh/h)	429	555	524	431								
Control Delay (s/veh)	20.0	14.5	15.4	11.1								
Approach Delay (s/veh)	20.0	14.5	15.4	11.1								
Approach LOS	C	B	C	B								
Intersection Summary												
Delay	16.6											
Level of Service	C											
Intersection Capacity Utilization	60.0%			ICU Level of Service			B					
Analysis Period (min)	15											

Lanes, Volumes, Timings (230561) 9408 Columbia
9: Forest Gate Avenue & Columbia Way 2028 PM Total

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	139	79	90	445	41	28
Future Volume (vph)	139	79	90	445	41	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.951				0.945	
Flt Protected				0.992	0.971	
Satd. Flow (prot)	1795	0	0	1869	1743	0
Flt Permitted				0.992	0.971	
Satd. Flow (perm)	1795	0	0	1869	1743	0
Link Speed (k/h)	60			60	50	
Link Distance (m)	237.5			314.7	240.6	
Travel Time (s)	14.3			18.9	17.3	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	1%	0%	0%	1%	0%	0%
Adj. Flow (vph)	158	90	102	506	47	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	248	0	0	608	79	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		100	100		100	100
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	54.5%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
9: Forest Gate Avenue & Columbia Way

(230561) 9408 Columbia
2028 PM Total

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	139	79	90	445	41	28
Future Volume (Veh/h)	139	79	90	445	41	28
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	158	90	102	506	47	32
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			248	913		203
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			248	913		203
tC, single (s)			4.1	6.4		6.2
tC, 2 stage (s)						
tF (s)			2.2	3.5		3.3
p0 queue free %			92	83		96
cM capacity (veh/h)			1330	283		843
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	248	608	79			
Volume Left	0	102	47			
Volume Right	90	0	32			
cSH	1700	1330	387			
Volume to Capacity	0.15	0.08	0.20			
Queue Length 95th (m)	0.0	2.0	6.0			
Control Delay (s/veh)	0.0	2.1	16.7			
Lane LOS	A		C			
Approach Delay (s/veh)	0.0	2.1	16.7			
Approach LOS			C			
Intersection Summary						
Average Delay			2.7			
Intersection Capacity Utilization	54.5%		ICU Level of Service	A		
Analysis Period (min)	15					

Lanes, Volumes, Timings

(230561) 9408 Columbia

10: Mount Hope Road & Mount Hope Road & Proposed East-West Street L North 2028 PM Total

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	2	0	0	316	137	1
Future Volume (vph)	2	0	0	316	137	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.999					
Flt Protected	0.950					
Satd. Flow (prot)	1770	0	0	1863	1861	0
Flt Permitted	0.950					
Satd. Flow (perm)	1770	0	0	1863	1861	0
Link Speed (k/h)	50		60		60	
Link Distance (m)	89.2		169.0		2188.9	
Travel Time (s)	6.4		10.1		131.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	0	0	343	149	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	0	0	343	150	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6		0.0		0.0	
Link Offset(m)	0.0		0.0		0.0	
Crosswalk Width(m)	4.8		4.8		4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15		25	
Sign Control	Stop		Free		Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	26.6%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis (230561) 9408 Columbia
10: Mount Hope Road & Mount Hope Road & Proposed East-West Street L North 2028 PM Total

	EBL	EBR	NBL	NBT	SBT	SBR
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Volume (veh/h)	2	0	0	316	137	1
Future Volume (Veh/h)	2	0	0	316	137	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	0	0	343	149	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	493	150	150			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	493	150	150			
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)	536	897	1431			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	2	343	150			
Volume Left	2	0	0			
Volume Right	0	0	1			
cSH	536	1431	1700			
Volume to Capacity	0.00	0.00	0.09			
Queue Length 95th (m)	0.1	0.0	0.0			
Control Delay (s/veh)	11.7	0.0	0.0			
Lane LOS	B					
Approach Delay (s/veh)	11.7	0.0	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay		0.0				
Intersection Capacity Utilization		26.6%		ICU Level of Service	A	
Analysis Period (min)		15				

Lanes, Volumes, Timings (230561) 9408 Columbia
11: Mount Hope Road & Mount Hope Road & Proposed East-West Street L South 2028 PM Total

	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Volume (vph)	1	10	11	278	110	2
Future Volume (vph)	1	10	11	278	110	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.876				0.998	
Flt Protected	0.996			0.998		
Satd. Flow (prot)	1625	0	0	1859	1859	0
Flt Permitted	0.996			0.998		
Satd. Flow (perm)	1625	0	0	1859	1859	0
Link Speed (k/h)	50			60	60	
Link Distance (m)	77.5			270.8	169.0	
Travel Time (s)	5.6			16.2	10.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	11	12	302	120	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	12	0	0	314	122	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 31.9%	ICU Level of Service A					
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis (230561) 9408 Columbia
11: Mount Hope Road & Mount Hope Road & Proposed East-West Street L South 2028 PM Total

	EBL	EBR	NBL	NBT	SBT	SBR
Movement						
Lane Configurations	W			W	W	
Traffic Volume (veh/h)	1	10	11	278	110	2
Future Volume (Veh/h)	1	10	11	278	110	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	11	12	302	120	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	447	121	122			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	447	121	122			
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	99	99			
cM capacity (veh/h)	564	930	1465			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	12	314	122			
Volume Left	1	12	0			
Volume Right	11	0	2			
cSH	883	1465	1700			
Volume to Capacity	0.01	0.01	0.07			
Queue Length 95th (m)	0.3	0.2	0.0			
Control Delay (s/veh)	9.1	0.4	0.0			
Lane LOS	A	A				
Approach Delay (s/veh)	9.1	0.4	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization		31.9%		ICU Level of Service	A	
Analysis Period (min)		15				

Measures of Effectiveness

(230561) 9408 Columbia
2028 PM Total

Network Totals	
Number of Intersections	11
Total Delay (hr)	27
Stops (#)	4446
Average Speed (km/hr)	46
Total Travel Time (hr)	136
Distance Traveled (km)	6243
Fuel Consumed (l)	762
Fuel Economy (km/l)	8.2
Unserviced Vehicles (#)	0
Vehicles in dilemma zone (#)	0
Performance Index	39.7

Appendix H

Synchro Reports – 2033 Background Operations



Lanes, Volumes, Timings
1: Hwy 50 [Peel Regional Road 50] & Columbia Way
(230561) 9408 Columbia
2033 PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	1	209	0	80	1	645	213	147	426	2
Future Volume (vph)	2	0	1	209	0	80	1	645	213	147	426	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0			0.0	60.0		0.0	136.0		300.0	85.0	25.0
Storage Lanes	0			0	1		0	1		0	1	1
Taper Length (m)	7.5			60.0			45.0			90.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					0.98							
Frt		0.955			0.850				0.850			0.850
Fit Protected		0.968		0.950			0.950			0.950		
Satd. Flow (prot)	0	1756	0	1787	1535	0	902	1863	1599	1770	1845	808
Fit Permitted		0.894		0.756			0.471			0.324		
Satd. Flow (perm)	0	1622	0	1422	1535	0	447	1863	1599	604	1845	808
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		40			232				224			33
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		56.6			246.0			735.7			477.2	
Travel Time (s)		4.1			17.7			53.0			34.4	
Confl. Bikes (#/hr)	1					1						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	1%	0%	3%	100%	2%	1%	2%	3%	100%
Adj. Flow (vph)	2	0	1	220	0	84	1	679	224	155	448	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	3	0	220	84	0	1	679	224	155	448	2
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			4			2		2		2
Permitted Phases	4			4			2		2	2		2
Detector Phase	4	4		4	4		2	2	2	2	2	2
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		20.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	25.0	25.0		25.0	25.0		30.7	30.7	30.7	30.7	30.7	30.7
Total Split (s)	36.0	36.0		36.0	36.0		64.0	64.0	64.0	64.0	64.0	64.0
Total Split (%)	36.0%	36.0%		36.0%	36.0%		64.0%	64.0%	64.0%	64.0%	64.0%	64.0%
Maximum Green (s)	30.0	30.0		30.0	30.0		57.3	57.3	57.3	57.3	57.3	57.3
Yellow Time (s)	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		2.7	2.7	2.7	2.7	2.7	2.7
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0		6.0	6.0		6.7	6.7	6.7	6.7	6.7	6.7
Lead/Lag												
Lead-Lag Optimize?												

Lanes, Volumes, Timings
1: Hwy 50 [Peel Regional Road 50] & Columbia Way
(230561) 9408 Columbia
2033 PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	8.0	8.0		8.0	8.0		8.0	8.0	8.0	8.0	8.0	8.0
Flash Don't Walk (s)	11.0	11.0		11.0	11.0		16.0	16.0	16.0	16.0	16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	20.7			20.7			66.6	66.6	66.6	66.6	66.6	66.6
Actuated g/C Ratio	0.21			0.21			0.67	0.67	0.67	0.67	0.67	0.67
v/c Ratio	0.01			0.75	0.17		0.00	0.55	0.20	0.39	0.36	0.00
Control Delay (s/veh)	0.0			52.2	0.7		8.0	12.0	1.6	12.6	9.4	0.0
Queue Delay	0.0			0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	0.0			52.2	0.7		8.0	12.0	1.6	12.6	9.4	0.0
LOS	A			D	A		A	B	A	B	A	A
Approach Delay (s/veh)				38.0				9.4			10.2	
Approach LOS				D				A			B	
Queue Length 50th (m)	0.0			42.3	0.0		0.1	65.4	0.0	12.8	36.2	0.0
Queue Length 95th (m)	0.0			62.4	0.0		0.8	119.9	9.3	33.3	67.8	0.0
Internal Link Dist (m)	32.6				222.0			711.7			453.2	
Turn Bay Length (m)				60.0			136.0		300.0	85.0		25.0
Base Capacity (vph)	514			426	622		297	1240	1139	402	1228	549
Starvation Cap Reductn	0			0	0		0	0	0	0	0	0
Spillback Cap Reductn	0			0	0		0	0	0	0	0	0
Storage Cap Reductn	0			0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.01			0.52	0.14		0.00	0.55	0.20	0.39	0.36	0.00

Intersection Summary
Area Type: Other
Cycle Length: 100
Actuated Cycle Length: 100
Offset: 15 (15%), Referenced to phase 2:NBSB and 6:, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay (s/veh): 14.4
Intersection Capacity Utilization 82.6%
ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 1: Hwy 50 [Peel Regional Road 50] & Columbia Way



HCM Signalized Intersection Capacity Analysis (230561) 9408 Columbia
1: Hwy 50 [Peel Regional Road 50] & Columbia Way 2033 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	1	209	0	80	1	645	213	147	426	2
Future Volume (vph)	2	0	1	209	0	80	1	645	213	147	426	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0		6.7	6.7	6.7	6.7	6.7	6.7
Lane Util. Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00		1.00	0.98		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.96		1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1756		1787	1534		903	1863	1599	1770	1845	808
Flt Permitted		0.89		0.76	1.00		0.47	1.00	1.00	0.32	1.00	1.00
Satd. Flow (perm)		1623		1422	1534		447	1863	1599	604	1845	808
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2	0	1	220	0	84	1	679	224	155	448	2
RTOR Reduction (vph)	0	2	0	0	67	0	0	0	75	0	0	1
Lane Group Flow (vph)	0	1	0	220	17	0	1	679	149	155	448	1
Confl. Bikes (#/hr)	1					1						
Heavy Vehicles (%)	0%	0%	0%	1%	0%	3%	100%	2%	1%	2%	3%	100%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2		2	2		2
Actuated Green, G (s)		20.7		20.7	20.7		66.6	66.6	66.6	66.6	66.6	66.6
Effective Green, g (s)		20.7		20.7	20.7		66.6	66.6	66.6	66.6	66.6	66.6
Actuated g/C Ratio		0.21		0.21	0.21		0.67	0.67	0.67	0.67	0.67	0.67
Clearance Time (s)		6.0		6.0	6.0		6.7	6.7	6.7	6.7	6.7	6.7
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		335		294	317		297	1240	1064	402	1228	538
v/s Ratio Prot					0.01			c0.36			0.24	
v/s Ratio Perm		0.00		c0.15			0.00		0.09	0.26		0.00
v/c Ratio		0.00		0.75	0.05		0.00	0.55	0.14	0.39	0.36	0.00
Uniform Delay, d1		31.5		37.2	31.8		5.6	8.8	6.2	7.5	7.4	5.6
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.0		10.0	0.1		0.0	1.7	0.3	2.8	0.8	0.0
Delay (s)		31.5		47.2	31.9		5.6	10.5	6.4	10.3	8.2	5.6
Level of Service		C		D	C		A	B	A	B	A	A
Approach Delay (s/veh)		31.5			42.9			9.5			8.7	
Approach LOS		C			D			A			A	
Intersection Summary												
HCM 2000 Control Delay (s/veh)	14.9			HCM 2000 Level of Service					B			
HCM 2000 Volume to Capacity ratio	0.59											
Actuated Cycle Length (s)	100.0			Sum of lost time (s)					12.7			
Intersection Capacity Utilization	82.6%			ICU Level of Service					E			
Analysis Period (min)	15											
c Critical Lane Group												

Lanes, Volumes, Timings (230561) 9408 Columbia
2: Kingsview Drive & Columbia Way 2033 PM

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	273	93	60	179	35	40
Future Volume (vph)	273	93	60	179	35	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99			1.00		
Frt	0.966				0.927	
Flt Protected				0.988	0.977	
Satd. Flow (prot)	1790	0	0	1840	1721	0
Flt Permitted				0.839	0.977	
Satd. Flow (perm)	1790	0	0	1559	1721	0
Right Turn on Red	Yes					Yes
Satd. Flow (RTOR)	29				43	
Link Speed (k/h)	50			50	50	
Link Distance (m)	246.0			351.6	165.2	
Travel Time (s)	17.7			25.3	11.9	
Confl. Peds. (#/hr)		8		8		
Confl. Bikes (#/hr)		2		2		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	0%	2%	2%	0%	0%
Adj. Flow (vph)	290	99	64	190	37	43
Shared Lane Traffic (%)						
Lane Group Flow (vph)	389	0	0	254	80	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15		25	25	15
Turn Type	NA		Perm	NA	Prot	
Protected Phases	2			6	8	
Permitted Phases				6		
Detector Phase	2			6	6	8
Switch Phase						
Minimum Initial (s)	8.0			8.0	8.0	
Minimum Split (s)	36.0			32.0	32.0	36.0
Total Split (s)	36.0			32.0	32.0	36.0
Total Split (%)	50.0%			44.4%	44.4%	50.0%
Maximum Green (s)	30.0			25.1	25.1	30.0
Yellow Time (s)	4.0			4.0	4.0	
All-Red Time (s)	2.0			2.9	2.9	2.0
Lost Time Adjust (s)	0.0			0.0	0.0	
Total Lost Time (s)	6.0			6.9	6.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0			3.0	3.0	3.0
Recall Mode	C-Max			C-Max	C-Max	None

Lanes, Volumes, Timings
2: Kingsview Drive & Columbia Way

(230561) 9408 Columbia
2033 PM

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Walk Time (s)	8.0		8.0	8.0	8.0	
Flash Don't Walk (s)	7.0		7.0	7.0	7.0	
Pedestrian Calls (#/hr)	0		0	0	0	
Act Effct Green (s)	55.5		54.7	8.5		
Actuated g/C Ratio	0.77		0.76	0.12		
v/c Ratio	0.28		0.21	0.33		
Control Delay (s/veh)	3.9		4.2	20.1		
Queue Delay	0.0		0.0	0.0		
Total Delay (s/veh)	3.9		4.2	20.1		
LOS	A		A	C		
Approach Delay (s/veh)	3.9		4.2	20.1		
Approach LOS	A		A	C		
Queue Length 50th (m)	14.1		10.1	4.9		
Queue Length 95th (m)	27.3		20.4	16.4		
Internal Link Dist (m)	222.0		327.6	141.2		
Turn Bay Length (m)						
Base Capacity (vph)	1385		1185	742		
Starvation Cap Reductn	0		0	0		
Spillback Cap Reductn	0		0	0		
Storage Cap Reductn	0		0	0		
Reduced v/c Ratio	0.28		0.21	0.11		

Intersection Summary

Area Type: Other
Cycle Length: 72
Actuated Cycle Length: 72
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.33
Intersection Signal Delay (s/veh): 5.8
Intersection LOS: A
Intersection Capacity Utilization 55.4%
ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 2: Kingsview Drive & Columbia Way



HCM Signalized Intersection Capacity Analysis
2: Kingsview Drive & Columbia Way

(230561) 9408 Columbia
2033 PM

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩			↩	↩	↩
Traffic Volume (vph)	273	93	60	179	35	40
Future Volume (vph)	273	93	60	179	35	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.9	6.0	
Lane Util. Factor	1.00			1.00	1.00	
Frpb, ped/bikes	0.99			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.97			1.00	0.93	
Flt Protected	1.00			0.99	0.98	
Satd. Flow (prot)	1789			1834	1722	
Flt Permitted	1.00			0.84	0.98	
Satd. Flow (perm)	1789			1558	1722	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	290	99	64	190	37	43
RTOR Reduction (vph)	8	0	0	0	39	0
Lane Group Flow (vph)	381	0	0	254	41	0
Confl. Peds. (#/hr)	8		8			
Confl. Bikes (#/hr)	2		2			
Heavy Vehicles (%)	2%	0%	2%	2%	0%	0%
Turn Type	NA		Perm	NA	Prot	
Protected Phases	2			6	8	
Permitted Phases			6			
Actuated Green, G (s)	53.1			52.2	6.9	
Effective Green, g (s)	53.1			52.2	6.9	
Actuated g/C Ratio	0.74			0.73	0.10	
Clearance Time (s)	6.0			6.9	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	1319			1129	165	
v/s Ratio Prot	c0.21				c0.02	
v/s Ratio Perm				0.16		
v/c Ratio	0.29			0.22	0.25	
Uniform Delay, d1	3.2			3.3	30.2	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.6			0.5	0.8	
Delay (s)	3.7			3.7	30.9	
Level of Service	A			A	C	
Approach Delay (s/veh)	3.7			3.7	30.9	
Approach LOS	A			A	C	

Intersection Summary

HCM 2000 Control Delay (s/veh) 6.7
HCM 2000 Volume to Capacity ratio 0.29
Actuated Cycle Length (s) 72.0
Intersection Capacity Utilization 55.4%
Analysis Period (min) 15
c Critical Lane Group

Lanes, Volumes, Timings
3: Westchester Road & Columbia Way

(230561) 9408 Columbia
2033 PM

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	247	69	48	189	48	37
Future Volume (vph)	247	69	48	189	48	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.971				0.941	
Flt Protected				0.990	0.973	
Satd. Flow (prot)	1823	0	0	1844	1666	0
Flt Permitted				0.990	0.973	
Satd. Flow (perm)	1823	0	0	1844	1666	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	570.4			296.2	121.1	
Travel Time (s)	41.1			21.3	8.7	
Confl. Peds. (#/hr)		6	6			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	2%	2%	2%	4%	5%
Adj. Flow (vph)	266	74	52	203	52	40
Shared Lane Traffic (%)						
Lane Group Flow (vph)	340	0	0	255	92	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	44.9%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
3: Westchester Road & Columbia Way

(230561) 9408 Columbia
2033 PM

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	247	69	48	189	48	37
Future Volume (Veh/h)	247	69	48	189	48	37
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	266	74	52	203	52	40
Pedestrians					6	
Lane Width (m)					3.6	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			346		616	309
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			346		616	309
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		88	94
cM capacity (veh/h)			1207		429	720
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	340	255	92			
Volume Left	0	52	52			
Volume Right	74	0	40			
cSH	1700	1207	521			
Volume to Capacity	0.20	0.04	0.18			
Queue Length 95th (m)	0.0	1.1	5.1			
Control Delay (s/veh)	0.0	2.0	13.4			
Lane LOS		A	B			
Approach Delay (s/veh)	0.0	2.0	13.4			
Approach LOS			B			
Intersection Summary						
Average Delay	2.5					
Intersection Capacity Utilization	44.9%			ICU Level of Service		A
Analysis Period (min)	15					

Lanes, Volumes, Timings
4: Mount Hope Road & Columbia Way

(230561) 9408 Columbia
2033 PM

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	214	50	20	162	29	23	6	11	16	9	45
Future Volume (vph)	44	214	50	20	162	29	23	6	11	16	9	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.978			0.981			0.961			0.914	
Flt Protected		0.993			0.995			0.972			0.989	
Satd. Flow (prot)	0	1777	0	0	1827	0	0	1725	0	0	1637	0
Flt Permitted		0.993			0.995			0.972			0.989	
Satd. Flow (perm)	0	1777	0	0	1827	0	0	1725	0	0	1637	0
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		296.2			237.5			421.4			3082.6	
Travel Time (s)		17.8			14.3			30.3			221.9	
Confl. Peds. (#/hr)			11	11								
Confl. Bikes (#/hr)			1	1								
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	3%	4%	4%	0%	2%	0%	0%	20%	0%	0%	8%	6%
Adj. Flow (vph)	47	228	53	21	172	31	24	6	12	17	10	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	328	0	0	224	0	0	42	0	0	75	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)	0.0				0.0			0.0			0.0	
Link Offset(m)	0.0				0.0			0.0			0.0	
Crosswalk Width(m)	4.8				4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	37.1%											
ICU Level of Service	A											
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
4: Mount Hope Road & Columbia Way

(230561) 9408 Columbia
2033 PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	214	50	20	162	29	23	6	11	16	9	45
Future Volume (Veh/h)	44	214	50	20	162	29	23	6	11	16	9	45
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	47	228	53	21	172	31	24	6	12	17	10	48
Pedestrians								11				
Lane Width (m)								3.6				
Walking Speed (m/s)								1.2				
Percent Blockage								1				
Right turn flare (veh)												
Median type	None											
Median storage (veh)	None											
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	203			292			642	605	266	593	616	188
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	203			292			642	605	266	593	616	188
tC, single (s)	4.1			4.1			7.1	6.7	6.2	7.1	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.2	3.3	3.5	4.1	3.4
p0 queue free %	97			98			93	98	98	96	97	94
cM capacity (veh/h)	1363			1269			341	366	771	390	375	844

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	328	224	42	75
Volume Left	47	21	24	17
Volume Right	53	31	12	48
cSH	1363	1269	410	590
Volume to Capacity	0.03	0.02	0.10	0.13
Queue Length 95th (m)	0.9	0.4	2.7	3.5
Control Delay (s/veh)	1.4	0.9	14.8	12.0
Lane LOS	A	A	B	B
Approach Delay (s/veh)	1.4	0.9	14.8	12.0
Approach LOS		B	B	

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	37.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lanes, Volumes, Timings
5: Caledon-King Townline South & Columbia Way

(230561) 9408 Columbia
2033 PM

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	48	134	184	555	320	45
Future Volume (vph)	48	134	184	555	320	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.901				0.983	
Flt Protected	0.987			0.988		
Satd. Flow (prot)	1615	0	0	1863	1820	0
Flt Permitted	0.987			0.988		
Satd. Flow (perm)	1615	0	0	1863	1820	0
Link Speed (k/h)	60			60	60	
Link Distance (m)	504.6			1060.6	1231.4	
Travel Time (s)	30.3			63.6	73.9	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	12%	2%	0%	1%	3%	0%
Adj. Flow (vph)	50	140	192	578	333	47
Shared Lane Traffic (%)						
Lane Group Flow (vph)	190	0	0	770	380	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	79.9%			ICU Level of Service D		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
5: Caledon-King Townline South & Columbia Way

(230561) 9408 Columbia
2033 PM

	EBL	EBR	NBL	NBT	SBT	SBR
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Volume (veh/h)	48	134	184	555	320	45
Future Volume (Veh/h)	48	134	184	555	320	45
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	50	140	192	578	333	47
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	1319	357	380			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1319	357	380			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	64	80	84			
cM capacity (veh/h)	138	688	1190			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	190	770	380			
Volume Left	50	192	0			
Volume Right	140	0	47			
cSH	336	1190	1700			
Volume to Capacity	0.56	0.16	0.22			
Queue Length 95th (m)	26.4	4.6	0.0			
Control Delay (s/veh)	28.7	3.7	0.0			
Lane LOS	D	A				
Approach Delay (s/veh)	28.7	3.7	0.0			
Approach LOS	D					
Intersection Summary						
Average Delay		6.2				
Intersection Capacity Utilization		79.9%		ICU Level of Service	D	
Analysis Period (min)		15				

Lanes, Volumes, Timings (230561) 9408 Columbia
8: Mount Hope Road & Castlederg Side Road 2033 PM

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	347	9	13	241	29	2	49	13	22	34	10
Future Volume (vph)	69	347	9	13	241	29	2	49	13	22	34	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.997			0.986			0.972			0.979	
Flt Protected		0.992			0.998			0.999			0.984	
Satd. Flow (prot)	0	1858	0	0	1730	0	0	1739	0	0	1759	0
Flt Permitted		0.992			0.998			0.999			0.984	
Satd. Flow (perm)	0	1858	0	0	1730	0	0	1739	0	0	1759	0
Link Speed (k/h)		70			70			60			60	
Link Distance (m)		528.0			555.3			3082.6			634.1	
Travel Time (s)		27.2			28.6			185.0			38.0	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	1%	14%	9%	9%	0%	0%	8%	0%	6%	4%	0%
Adj. Flow (vph)	73	369	10	14	256	31	2	52	14	23	36	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	452	0	0	301	0	0	68	0	0	70	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	58.1%				ICU Level of Service B							
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis (230561) 9408 Columbia
8: Mount Hope Road & Castlederg Side Road 2033 PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	69	347	9	13	241	29	2	49	13	22	34	10
Future Volume (vph)	69	347	9	13	241	29	2	49	13	22	34	10
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	73	369	10	14	256	31	2	52	14	23	36	11
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	452	301	68	70								
Volume Left (vph)	73	14	2	23								
Volume Right (vph)	10	31	14	11								
Hadj (s)	0.04	0.08	-0.01	0.04								
Departure Headway (s)	4.8	5.0	5.9	5.9								
Degree Utilization, x	0.60	0.42	0.11	0.11								
Capacity (veh/h)	732	696	527	528								
Control Delay (s/veh)	14.5	11.5	9.6	9.7								
Approach Delay (s/veh)	14.5	11.5	9.6	9.7								
Approach LOS	B	B	A	A								
Intersection Summary												
Delay	12.7											
Level of Service	B											
Intersection Capacity Utilization	58.1%		ICU Level of Service				B					
Analysis Period (min)	15											

Lanes, Volumes, Timings
9: Forest Gate Avenue & Columbia Way

(230561) 9408 Columbia
2033 PM

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Traffic Volume (vph)	97	79	90	115	41	28
Future Volume (vph)	97	79	90	115	41	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.939				0.945	
Flt Protected				0.979	0.971	
Satd. Flow (prot)	1774	0	0	1850	1743	0
Flt Permitted				0.979	0.971	
Satd. Flow (perm)	1774	0	0	1850	1743	0
Link Speed (k/h)	60			60	50	
Link Distance (m)	237.5			314.7	240.6	
Travel Time (s)	14.3			18.9	17.3	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	1%	0%	0%	1%	0%	0%
Adj. Flow (vph)	110	90	102	131	47	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	200	0	0	233	79	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15	25		25	15
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	34.9%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
9: Forest Gate Avenue & Columbia Way

(230561) 9408 Columbia
2033 PM

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Traffic Volume (veh/h)	97	79	90	115	41	28
Future Volume (Veh/h)	97	79	90	115	41	28
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	110	90	102	131	47	32
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			200		490	155
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			200		490	155
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		91	96
cM capacity (veh/h)			1384		501	896
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	200	233	79			
Volume Left	0	102	47			
Volume Right	90	0	32			
cSH	1700	1384	610			
Volume to Capacity	0.12	0.07	0.13			
Queue Length 95th (m)	0.0	1.9	3.5			
Control Delay (s/veh)	0.0	3.8	11.8			
Lane LOS		A	B			
Approach Delay (s/veh)	0.0	3.8	11.8			
Approach LOS			B			
Intersection Summary						
Average Delay			3.5			
Intersection Capacity Utilization		34.9%		ICU Level of Service		A
Analysis Period (min)		15				

Measures of Effectiveness

(230561) 9408 Columbia
2033 PM

Network Totals

Number of Intersections	7
Total Delay (hr)	14
Stops (#)	3073
Average Speed (km/hr)	48
Total Travel Time (hr)	92
Distance Traveled (km)	4400
Fuel Consumed (l)	528
Fuel Economy (km/l)	8.3
Unserved Vehicles (#)	0
Vehicles in dilemma zone (#)	0
Performance Index	23.0

Appendix I

Synchro Reports – 2033 Total Operations



Lanes, Volumes, Timings
1: Hwy 50 [Peel Regional Road 50] & Columbia Way (230561) 9408 Columbia
2033 PM Total

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	1	263	0	104	1	645	230	194	426	2
Future Volume (vph)	2	0	1	263	0	104	1	645	230	194	426	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	60.0		0.0	136.0		300.0	85.0		25.0
Storage Lanes	0		0	1		0	1		0	1		1
Taper Length (m)	7.5			60.0			45.0			90.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor					0.98							
Frt		0.955			0.850				0.850			0.850
Flt Protected		0.968		0.950			0.950			0.950		
Satd. Flow (prot)	0	1756	0	1787	1535	0	902	1863	1599	1770	1845	808
Flt Permitted		0.898		0.756			0.461			0.308		
Satd. Flow (perm)	0	1629	0	1422	1535	0	438	1863	1599	574	1845	808
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		40			232				242			33
Link Speed (k/h)		50			50			50				50
Link Distance (m)		56.6			246.0			735.7				477.2
Travel Time (s)		4.1			17.7			53.0				34.4
Confl. Bikes (#/hr)	1					1						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	0%	0%	1%	0%	3%	100%	2%	1%	2%	3%	100%
Adj. Flow (vph)	2	0	1	277	0	109	1	679	242	204	448	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	3	0	277	109	0	1	679	242	204	448	2
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2		2	2		2
Detector Phase	4	4		4	4		2	2	2	2	2	2
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		20.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	25.0	25.0		25.0	25.0		30.7	30.7	30.7	30.7	30.7	30.7
Total Split (s)	36.0	36.0		36.0	36.0		64.0	64.0	64.0	64.0	64.0	64.0
Total Split (%)	36.0%	36.0%		36.0%	36.0%		64.0%	64.0%	64.0%	64.0%	64.0%	64.0%
Maximum Green (s)	30.0	30.0		30.0	30.0		57.3	57.3	57.3	57.3	57.3	57.3
Yellow Time (s)	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		2.7	2.7	2.7	2.7	2.7	2.7
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0		6.0	6.0		6.7	6.7	6.7	6.7	6.7	6.7
Lead/Lag												
Lead-Lag Optimize?												

Paradigm Transportation Solutions Limited

Synchro 11 Report
Page 1

Lanes, Volumes, Timings
1: Hwy 50 [Peel Regional Road 50] & Columbia Way (230561) 9408 Columbia
2033 PM Total

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	8.0	8.0		8.0	8.0		8.0	8.0	8.0	8.0	8.0	8.0
Flash Don't Walk (s)	11.0	11.0		11.0	11.0		16.0	16.0	16.0	16.0	16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	23.9			23.9	23.9		63.4	63.4	63.4	63.4	63.4	63.4
Actuated g/C Ratio	0.24			0.24	0.24		0.63	0.63	0.63	0.63	0.63	0.63
v/c Ratio	0.01			0.81	0.20		0.00	0.58	0.22	0.56	0.38	0.00
Control Delay (s/veh)	0.0			54.3	0.8		9.0	14.1	1.8	19.8	11.0	0.0
Queue Delay	0.0			0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	0.0			54.3	0.8		9.0	14.1	1.8	19.8	11.0	0.0
LOS	A			D	A		A	B	A	B	B	A
Approach Delay (s/veh)					39.2			10.9			13.7	
Approach LOS					D			B			B	
Queue Length 50th (m)	0.0			53.0	0.0		0.1	74.6	0.0	22.1	41.3	0.0
Queue Length 95th (m)	0.0			78.4	0.0		0.8	125.5	10.0	55.3	71.0	0.0
Internal Link Dist (m)		32.6			222.0			711.7			453.2	
Turn Bay Length (m)				60.0			136.0		300.0	85.0		25.0
Base Capacity (vph)		516		426	622		277	1180	1101	363	1169	524
Starvation Cap Reductn	0		0	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0		0	0	0		0	0	0	0	0	0
Storage Cap Reductn	0		0	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.01		0.65	0.18			0.00	0.58	0.22	0.56	0.38	0.00

Intersection Summary

Area Type:	Other
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 15 (15%), Referenced to phase 2:NBSB and 6-; Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay (s/veh): 17.4	Intersection LOS: B
Intersection Capacity Utilization 86.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 1: Hwy 50 [Peel Regional Road 50] & Columbia Way



Paradigm Transportation Solutions Limited

Synchro 11 Report
Page 2

HCM Signalized Intersection Capacity Analysis (230561) 9408 Columbia
1: Hwy 50 [Peel Regional Road 50] & Columbia Way 2033 PM Total

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔		↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	2	0	1	263	0	104	1	645	230	194	426	2
Future Volume (vph)	2	0	1	263	0	104	1	645	230	194	426	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		6.0	6.0		6.7	6.7	6.7	6.7	6.7	6.7
Lane Util. Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes		1.00		1.00	0.98		1.00	1.00	1.00	1.00	1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.96		1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1756		1787	1534		903	1863	1599	1770	1845	808
Flt Permitted		0.90		0.76	1.00		0.46	1.00	1.00	0.31	1.00	1.00
Satd. Flow (perm)		1630		1422	1534		438	1863	1599	573	1845	808
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	2	0	1	277	0	109	1	679	242	204	448	2
RTOR Reduction (vph)	0	2	0	0	83	0	0	0	89	0	0	1
Lane Group Flow (vph)	0	1	0	277	26	0	1	679	153	204	448	1
Confl. Bikes (#/hr)	1					1						
Heavy Vehicles (%)	0%	0%	0%	1%	0%	3%	100%	2%	1%	2%	3%	100%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			4			2			2	
Permitted Phases	4			4			2		2	2		2
Actuated Green, G (s)		23.9		23.9	23.9		63.4	63.4	63.4	63.4	63.4	63.4
Effective Green, g (s)		23.9		23.9	23.9		63.4	63.4	63.4	63.4	63.4	63.4
Actuated g/C Ratio		0.24		0.24	0.24		0.63	0.63	0.63	0.63	0.63	0.63
Clearance Time (s)		6.0		6.0	6.0		6.7	6.7	6.7	6.7	6.7	6.7
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		389		339	366		277	1181	1013	363	1169	512
v/s Ratio Prot					0.02			0.36			0.24	
v/s Ratio Perm	0.00			0.19			0.00		0.10	0.36		0.00
v/c Ratio	0.00			0.82	0.07		0.00	0.57	0.15	0.56	0.38	0.00
Uniform Delay, d1	29.0			36.0	29.5		6.7	10.5	7.4	10.4	8.8	6.7
Progression Factor	1.00			1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0			14.1	0.1		0.0	2.0	0.3	6.2	1.0	0.0
Delay (s)	29.0			50.1	29.5		6.7	12.6	7.7	16.6	9.8	6.7
Level of Service	C			D	C		A	B	A	B	A	A
Approach Delay (s/veh)	29.0				44.3			11.3			11.9	
Approach LOS	C				D			B			B	
Intersection Summary												
HCM 2000 Control Delay (s/veh)		18.0										
HCM 2000 Volume to Capacity ratio		0.64										
Actuated Cycle Length (s)		100.0							12.7			
Intersection Capacity Utilization		86.6%										
Analysis Period (min)		15										
c Critical Lane Group												

Lanes, Volumes, Timings (230561) 9408 Columbia
2: Kingsview Drive & Columbia Way 2033 PM Total

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↔	↔	↔
Traffic Volume (vph)	337	93	60	257	35	40
Future Volume (vph)	337	93	60	257	35	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.99			1.00		
Frt	0.971				0.927	
Flt Protected				0.991	0.977	
Satd. Flow (prot)	1800	0	0	1846	1721	0
Flt Permitted				0.857	0.977	
Satd. Flow (perm)	1800	0	0	1594	1721	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	24				43	
Link Speed (k/h)	50			50	50	
Link Distance (m)	246.0			351.6	165.2	
Travel Time (s)	17.7			25.3	11.9	
Confl. Peds. (#/hr)		8		8		
Confl. Bikes (#/hr)		2		2		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	2%	0%	2%	2%	0%	0%
Adj. Flow (vph)	359	99	64	273	37	43
Shared Lane Traffic (%)						
Lane Group Flow (vph)	458	0	0	337	80	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			3.6	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		15		25	25	15
Turn Type	NA		Perm	NA	Prot	
Protected Phases	2			6	8	
Permitted Phases			6			
Detector Phase	2		6	6	8	
Switch Phase						
Minimum Initial (s)	8.0		8.0	8.0	8.0	
Minimum Split (s)	36.0		32.0	32.0	36.0	
Total Split (s)	36.0		32.0	32.0	36.0	
Total Split (%)	50.0%		44.4%	44.4%	50.0%	
Maximum Green (s)	30.0		25.1	25.1	30.0	
Yellow Time (s)	4.0		4.0	4.0	4.0	
All-Red Time (s)	2.0		2.9	2.9	2.0	
Lost Time Adjust (s)	0.0			0.0	0.0	
Total Lost Time (s)	6.0			6.9	6.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Recall Mode	C-Max		C-Max	C-Max	None	

Lanes, Volumes, Timings
2: Kingsview Drive & Columbia Way

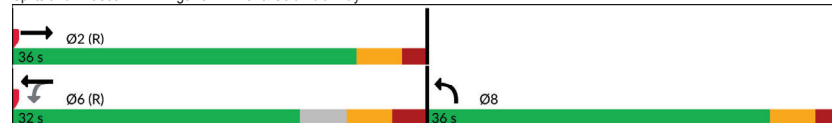
(230561) 9408 Columbia
2033 PM Total

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Walk Time (s)	8.0		8.0	8.0	8.0	
Flash Don't Walk (s)	7.0		7.0	7.0	7.0	
Pedestrian Calls (#/hr)	0		0	0	0	
Act Effct Green (s)	55.5			54.7	8.5	
Actuated g/C Ratio	0.77			0.76	0.12	
v/c Ratio	0.33			0.28	0.33	
Control Delay (s/veh)	4.2			4.6	20.1	
Queue Delay	0.0			0.0	0.0	
Total Delay (s/veh)	4.2			4.6	20.1	
LOS	A			A	C	
Approach Delay (s/veh)	4.2			4.6	20.1	
Approach LOS	A			A	C	
Queue Length 50th (m)	17.8			14.2	4.9	
Queue Length 95th (m)	34.1			27.7	16.4	
Internal Link Dist (m)	222.0			327.6	141.2	
Turn Bay Length (m)						
Base Capacity (vph)	1392			1212	742	
Starvation Cap Reductn	0			0	0	
Spillback Cap Reductn	0			0	0	
Storage Cap Reductn	0			0	0	
Reduced v/c Ratio	0.33			0.28	0.11	

Intersection Summary

Area Type: Other
 Cycle Length: 72
 Actuated Cycle Length: 72
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green
 Natural Cycle: 75
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.33
 Intersection Signal Delay (s/veh): 5.8
 Intersection LOS: A
 Intersection Capacity Utilization 62.8%
 ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 2: Kingsview Drive & Columbia Way



HCM Signalized Intersection Capacity Analysis
2: Kingsview Drive & Columbia Way

(230561) 9408 Columbia
2033 PM Total

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↘			↘	↘	↘
Traffic Volume (vph)	337	93	60	257	35	40
Future Volume (vph)	337	93	60	257	35	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0			6.9	6.0	
Lane Util. Factor	1.00			1.00	1.00	
Frpb, ped/bikes	0.99			1.00	1.00	
Flpb, ped/bikes	1.00			1.00	1.00	
Frt	0.97			1.00	0.93	
Flt Protected	1.00			0.99	0.98	
Satd. Flow (prot)	1800			1842	1722	
Flt Permitted	1.00			0.86	0.98	
Satd. Flow (perm)	1800			1594	1722	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	359	99	64	273	37	43
RTOR Reduction (vph)	6	0	0	0	39	0
Lane Group Flow (vph)	452	0	0	337	41	0
Confl. Peds. (#/hr)		8	8			
Confl. Bikes (#/hr)		2	2			
Heavy Vehicles (%)	2%	0%	2%	2%	0%	0%
Turn Type	NA		Perm	NA	Prot	
Protected Phases	2			6	8	
Permitted Phases			6			
Actuated Green, G (s)	53.1			52.2	6.9	
Effective Green, g (s)	53.1			52.2	6.9	
Actuated g/C Ratio	0.74			0.73	0.10	
Clearance Time (s)	6.0			6.9	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	1327			1155	165	
v/s Ratio Prot	c0.25				c0.02	
v/s Ratio Perm				0.21		
v/c Ratio	0.34			0.29	0.25	
Uniform Delay, d1	3.3			3.5	30.2	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	0.7			0.6	0.8	
Delay (s)	4.0			4.1	30.9	
Level of Service	A			A	C	
Approach Delay (s/veh)	4.0			4.1	30.9	
Approach LOS	A			A	C	

Intersection Summary

HCM 2000 Control Delay (s/veh) 6.5
 HCM 2000 Volume to Capacity ratio 0.33
 Actuated Cycle Length (s) 72.0
 Intersection Capacity Utilization 62.8%
 Analysis Period (min) 15
 HCM 2000 Level of Service A
 Sum of lost time (s) 12.9
 ICU Level of Service B
 Critical Lane Group

Lanes, Volumes, Timings (230561) 9408 Columbia
3: Westchester Road/Proposed North-South Street A & Columbia Way 2033 PM Total

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	219	69	48	166	208	48	0	37	86	0	101
Future Volume (vph)	93	219	69	48	166	208	48	0	37	86	0	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.976			0.933			0.941			0.927	
Flt Protected		0.988			0.994			0.973			0.978	
Satd. Flow (prot)	0	1806	0	0	1728	0	0	1666	0	0	1689	0
Flt Permitted		0.988			0.994			0.973			0.978	
Satd. Flow (perm)	0	1806	0	0	1728	0	0	1666	0	0	1689	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		570.4			296.2			121.1			29.1	
Travel Time (s)		41.1			21.3			8.7			2.1	
Confl. Peds. (#/hr)			6	6								
Peak Hour Factor	0.92	0.93	0.93	0.93	0.93	0.92	0.93	0.92	0.93	0.92	0.92	0.92
Heavy Vehicles (%)	2%	1%	2%	2%	2%	2%	4%	2%	5%	2%	2%	2%
Adj. Flow (vph)	101	235	74	52	178	226	52	0	40	93	0	110
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	410	0	0	456	0	0	92	0	0	203	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Free			Free			Stop			Stop	

Intersection Summary	
Area Type:	Other
Control Type:	Unsignalized
Intersection Capacity Utilization	57.3%
Analysis Period (min)	15
ICU Level of Service B	

HCM Unsignalized Intersection Capacity Analysis (230561) 9408 Columbia
3: Westchester Road/Proposed North-South Street A & Columbia Way 2033 PM Total

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	219	69	48	166	208	48	0	37	86	0	101
Future Volume (Veh/h)	93	219	69	48	166	208	48	0	37	86	0	101
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.93	0.93	0.93	0.93	0.92	0.93	0.92	0.93	0.92	0.92	0.92
Hourly flow rate (vph)	101	235	74	52	178	226	52	0	40	93	0	110
Pedestrians								6				
Lane Width (m)								3.6				
Walking Speed (m/s)								1.2				
Percent Blockage								1				
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	404			315			985	988	278	909	912	291
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	404			315			985	988	278	909	912	291
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 %	91			96			70	100	95	57	100	85
cM capacity (veh/h)	1155			1239			172	215	750	218	238	748

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	410	456	92	203
Volume Left	101	52	52	93
Volume Right	74	226	40	110
cSH	1155	1239	259	354
Volume to Capacity	0.09	0.04	0.36	0.57
Queue Length 95th (m)	2.3	1.1	12.3	27.3
Control Delay (s/veh)	2.8	1.3	26.4	28.0
Lane LOS	A	A	D	D
Approach Delay (s/veh)	2.8	1.3	26.4	28.0
Approach LOS		D	D	

Intersection Summary			
Average Delay	8.5		
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
Analysis Period (min)	15		

Lanes, Volumes, Timings
4: Mount Hope Road & Columbia Way

(230561) 9408 Columbia
2033 PM Total

	↖	→	↗	↖	←	↖	↖	↑	↗	↘	↓	↘
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (vph)	67	249	50	20	337	170	23	6	11	44	9	55
Future Volume (vph)	67	249	50	20	337	170	23	6	11	44	9	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.982			0.956			0.961			0.931	
Flt Protected		0.991			0.998			0.972			0.980	
Satd. Flow (prot)	0	1781	0	0	1790	0	0	1725	0	0	1671	0
Flt Permitted		0.991			0.998			0.972			0.980	
Satd. Flow (perm)	0	1781	0	0	1790	0	0	1725	0	0	1671	0
Link Speed (k/h)		60			60			50			60	
Link Distance (m)		296.2			237.5			421.4			267.1	
Travel Time (s)		17.8			14.3			30.3			16.0	
Confl. Peds. (#/hr)			11	11								
Confl. Bikes (#/hr)			1	1								
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	3%	4%	4%	0%	2%	0%	0%	20%	0%	0%	8%	6%
Adj. Flow (vph)	71	265	53	21	359	181	24	6	12	47	10	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	389	0	0	561	0	0	42	0	0	116	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left Right	Left	Left	Left Right	Left	Left	Left Right	Left	Left	Left Right	Left
Median Width(m)	0.0			0.0			0.0			0.0		
Link Offset(m)	0.0			0.0			0.0			0.0		
Crosswalk Width(m)	4.8			4.8			4.8			4.8		
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control	Free			Free			Stop			Stop		
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	59.8%											
ICU Level of Service	B											
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis
4: Mount Hope Road & Columbia Way

(230561) 9408 Columbia
2033 PM Total

	↖	→	↗	↖	←	↖	↖	↑	↗	↘	↓	↘
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Volume (veh/h)	67	249	50	20	337	170	23	6	11	44	9	55
Future Volume (Veh/h)	67	249	50	20	337	170	23	6	11	44	9	55
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	71	265	53	21	359	181	24	6	12	47	10	59
Pedestrians								11				
Lane Width (m)								3.6				
Walking Speed (m/s)								1.2				
Percent Blockage								1				
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	540			329			1000	1027	303	940	963	450
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	540			329			1000	1027	303	940	963	450
tC, single (s)	4.1			4.1			7.1	6.7	6.2	7.1	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.2	3.3	3.5	4.1	3.4
p0 queue free %	93			98			87	97	98	79	96	90
cM capacity (veh/h)	1023			1230			179	198	735	219	226	601
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	389	561	42	116								
Volume Left	71	21	24	47								
Volume Right	53	181	12	59								
cSH	1023	1230	233	325								
Volume to Capacity	0.07	0.02	0.18	0.36								
Queue Length 95th (m)	1.8	0.4	5.1	12.5								
Control Delay (s/veh)	2.2	0.5	23.8	22.1								
Lane LOS	A	A	C	C								
Approach Delay (s/veh)	2.2	0.5	23.8	22.1								
Approach LOS		C		C								
Intersection Summary												
Average Delay		4.2										
Intersection Capacity Utilization		59.8%					ICU Level of Service			B		
Analysis Period (min)		15										

Lanes, Volumes, Timings

5: Caledon-King Townline South & Columbia Way

(230561) 9408 Columbia

2033 PM Total

						
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	111	134	184	555	320	361
Future Volume (vph)	111	134	184	555	320	361
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.926				0.928	
Flt Protected	0.978			0.988		
Satd. Flow (prot)	1615	0	0	1863	1739	0
Flt Permitted	0.978			0.988		
Satd. Flow (perm)	1615	0	0	1863	1739	0
Link Speed (k/h)	60			60	60	
Link Distance (m)	504.6			1060.6	1231.4	
Travel Time (s)	30.3			63.6	73.9	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	12%	2%	0%	1%	3%	0%
Adj. Flow (vph)	116	140	192	578	333	376
Shared Lane Traffic (%)						
Lane Group Flow (vph)	256	0	0	770	709	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	102.7%			ICU Level of Service G		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis

5: Caledon-King Townline South & Columbia Way

(230561) 9408 Columbia

2033 PM Total

	↖	↗	↖	↗	↖	↗
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Volume (veh/h)	111	134	184	555	320	361
Future Volume (Veh/h)	111	134	184	555	320	361
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	116	140	192	578	333	376
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	1483	521	709			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1483	521	709			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	0	75	79			
cM capacity (veh/h)	103	555	899			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	256	770	709			
Volume Left	116	192	0			
Volume Right	140	0	376			
cSH	185	899	1700			
Volume to Capacity	1.38	0.21	0.42			
Queue Length 95th (m)	121.3	6.5	0.0			
Control Delay (s/veh)	249.5	5.0	0.0			
Lane LOS	F	A				
Approach Delay (s/veh)	249.5	5.0	0.0			
Approach LOS	F					
Intersection Summary						
Average Delay		39.0				
Intersection Capacity Utilization		102.7%		ICU Level of Service	G	
Analysis Period (min)		15				

Lanes, Volumes, Timings
6: Mount Hope Road & Proposed East-West Street C

(230561) 9408 Columbia
2033 PM Total

	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Volume (vph)	108	24	43	177	95	21
Future Volume (vph)	108	24	43	177	95	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.975			0.975		
Flt Protected	0.961			0.990		
Satd. Flow (prot)	1745	0	0	1844	1816	0
Flt Permitted	0.961			0.990		
Satd. Flow (perm)	1745	0	0	1844	1816	0
Link Speed (k/h)	50			60	60	
Link Distance (m)	124.1			186.7	270.8	
Travel Time (s)	8.9			11.2	16.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	117	26	47	192	103	23
Shared Lane Traffic (%)						
Lane Group Flow (vph)	143	0	0	239	126	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 32.5%	ICU Level of Service A					
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis
6: Mount Hope Road & Proposed East-West Street C

(230561) 9408 Columbia
2033 PM Total

	EBL	EBR	NBL	NBT	SBT	SBR
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Volume (veh/h)	108	24	43	177	95	21
Future Volume (Veh/h)	108	24	43	177	95	21
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	117	26	47	192	103	23
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	115	126			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	401	115	126			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	80	97	97			
cM capacity (veh/h)	586	938	1460			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	143	239	126			
Volume Left	117	47	0			
Volume Right	26	0	23			
cSH	629	1460	1700			
Volume to Capacity	0.23	0.03	0.07			
Queue Length 95th (m)	7.0	0.8	0.0			
Control Delay (s/veh)	12.4	1.7	0.0			
Lane LOS	B	A				
Approach Delay (s/veh)	12.4	1.7	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay		4.3				
Intersection Capacity Utilization		32.5%		ICU Level of Service	A	
Analysis Period (min)		15				

Lanes, Volumes, Timings

7: Mount Hope Road & Proposed East-West Street B

(230561) 9408 Columbia

2033 PM Total

	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Volume (vph)	96	24	119	124	83	36
Future Volume (vph)	96	24	119	124	83	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.973				0.959	
Flt Protected	0.962			0.976		
Satd. Flow (prot)	1744	0	0	1818	1786	0
Flt Permitted	0.962			0.976		
Satd. Flow (perm)	1744	0	0	1818	1786	0
Link Speed (k/h)	50			60	60	
Link Distance (m)	134.0			267.1	186.7	
Travel Time (s)	9.6			16.0	11.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	104	26	129	135	90	39
Shared Lane Traffic (%)						
Lane Group Flow (vph)	130	0	0	264	129	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 33.2%	ICU Level of Service A					
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis

7: Mount Hope Road & Proposed East-West Street B

(230561) 9408 Columbia

2033 PM Total

	EBL	EBR	NBL	NBT	SBT	SBR
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Volume (veh/h)	96	24	119	124	83	36
Future Volume (Veh/h)	96	24	119	124	83	36
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	104	26	129	135	90	39
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	503	110	129			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	503	110	129			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	78	97	91			
cM capacity (veh/h)	482	944	1457			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	130	264	129			
Volume Left	104	129	0			
Volume Right	26	0	39			
cSH	534	1457	1700			
Volume to Capacity	0.24	0.09	0.08			
Queue Length 95th (m)	7.6	2.3	0.0			
Control Delay (s/veh)	13.9	4.1	0.0			
Lane LOS	B	A				
Approach Delay (s/veh)	13.9	4.1	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay		5.5				
Intersection Capacity Utilization		33.2%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings (230561) 9408 Columbia
8: Mount Hope Road & Castlederg Side Road 2033 PM Total

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	347	26	26	241	29	68	189	16	22	54	10
Future Volume (vph)	69	347	26	26	241	29	68	189	16	22	54	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992			0.987			0.992			0.984	
Flt Protected		0.992			0.996			0.988			0.988	
Satd. Flow (prot)	0	1840	0	0	1728	0	0	1764	0	0	1776	0
Flt Permitted		0.992			0.996			0.988			0.988	
Satd. Flow (perm)	0	1840	0	0	1728	0	0	1764	0	0	1776	0
Link Speed (k/h)		70			70			60			60	
Link Distance (m)		528.0			555.3			2188.9			634.1	
Travel Time (s)		27.2			28.6			131.3			38.0	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	0%	1%	14%	9%	9%	0%	0%	8%	0%	6%	4%	0%
Adj. Flow (vph)	73	369	28	28	256	31	72	201	17	23	57	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	470	0	0	315	0	0	290	0	0	91	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		0.0			0.0			0.0			0.0	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											
Intersection Capacity Utilization	64.1%											
Analysis Period (min)	15											
ICU Level of Service C												

HCM Unsignalized Intersection Capacity Analysis (230561) 9408 Columbia
8: Mount Hope Road & Castlederg Side Road 2033 PM Total

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	69	347	26	26	241	29	68	189	16	22	54	10
Future Volume (vph)	69	347	26	26	241	29	68	189	16	22	54	10
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	73	369	28	28	256	31	72	201	17	23	57	11
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	470	315	290	91								
Volume Left (vph)	73	28	72	23								
Volume Right (vph)	28	31	17	11								
Hadj (s)	0.02	0.10	0.11	0.05								
Departure Headway (s)	5.9	6.3	6.6	7.2								
Degree Utilization, x	0.77	0.55	0.53	0.18								
Capacity (veh/h)	590	533	499	425								
Control Delay (s/veh)	25.9	16.6	16.8	11.8								
Approach Delay (s/veh)	25.9	16.6	16.8	11.8								
Approach LOS	D	C	C	B								
Intersection Summary												
Delay	20.0											
Level of Service	C											
Intersection Capacity Utilization	64.1%											
Analysis Period (min)	15											
ICU Level of Service C												

Lanes, Volumes, Timings
9: Forest Gate Avenue & Columbia Way

(230561) 9408 Columbia
2033 PM Total

						
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	160	79	90	431	41	28
Future Volume (vph)	160	79	90	431	41	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.955				0.945	
Flt Protected				0.991	0.971	
Satd. Flow (prot)	1802	0	0	1867	1743	0
Flt Permitted				0.991	0.971	
Satd. Flow (perm)	1802	0	0	1867	1743	0
Link Speed (k/h)	60			60	50	
Link Distance (m)	237.5			314.7	240.6	
Travel Time (s)	14.3			18.9	17.3	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	1%	0%	0%	1%	0%	0%
Adj. Flow (vph)	182	90	102	490	47	32
Shared Lane Traffic (%)						
Lane Group Flow (vph)	272	0	0	592	79	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	0.0			0.0	3.6	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)		100	100		100	100
Sign Control	Free			Free	Stop	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization	54.9%			ICU Level of Service A		
Analysis Period (min)	15					

HCM Unsignalized Intersection Capacity Analysis
9: Forest Gate Avenue & Columbia Way

(230561) 9408 Columbia
2033 PM Total

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Traffic Volume (veh/h)	160	79	90	431	41	28
Future Volume (Veh/h)	160	79	90	431	41	28
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	182	90	102	490	47	32
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			272		921	227
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			272		921	227
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			92		83	96
cM capacity (veh/h)			1303		279	817
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	272	592	79			
Volume Left	0	102	47			
Volume Right	90	0	32			
cSH	1700	1303	381			
Volume to Capacity	0.16	0.08	0.21			
Queue Length 95th (m)	0.0	2.0	6.2			
Control Delay (s/veh)	0.0	2.1	16.9			
Lane LOS		A	C			
Approach Delay (s/veh)	0.0	2.1	16.9			
Approach LOS			C			
Intersection Summary						
Average Delay		2.7				
Intersection Capacity Utilization		54.9%		ICU Level of Service	A	
Analysis Period (min)		15				

Lanes, Volumes, Timings (230561) 9408 Columbia
10: Mount Hope Road & Mount Hope Road & Proposed East-West Street L North 033 PM Total

	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Volume (vph)	2	0	0	302	147	1
Future Volume (vph)	2	0	0	302	147	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt				0.999		
Flt Protected	0.950					
Satd. Flow (prot)	1770	0	0	1863	1861	0
Flt Permitted	0.950					
Satd. Flow (perm)	1770	0	0	1863	1861	0
Link Speed (k/h)	50			60	60	
Link Distance (m)	89.2			169.0	2188.9	
Travel Time (s)	6.4			10.1	131.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	0	0	328	160	1
Shared Lane Traffic (%)						
Lane Group Flow (vph)	2	0	0	328	161	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 25.9%	ICU Level of Service A					
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis (230561) 9408 Columbia
10: Mount Hope Road & Mount Hope Road & Proposed East-West Street L North 033 PM Total

	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Volume (veh/h)	2	0	0	302	147	1
Future Volume (Veh/h)	2	0	0	302	147	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	0	0	328	160	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	489	161	161			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	489	161	161			
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)	539	885	1418			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	2	328	161			
Volume Left	2	0	0			
Volume Right	0	0	1			
cSH	539	1418	1700			
Volume to Capacity	0.00	0.00	0.09			
Queue Length 95th (m)	0.1	0.0	0.0			
Control Delay (s/veh)	11.7	0.0	0.0			
Lane LOS	B					
Approach Delay (s/veh)	11.7	0.0	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay		0.0				
Intersection Capacity Utilization		25.9%		ICU Level of Service		A
Analysis Period (min)		15				

Lanes, Volumes, Timings (230561) 9408 Columbia
11: Mount Hope Road & Mount Hope Road & Proposed East-West Street L Sou2033 PM Total

	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Volume (vph)	1	12	7	285	116	2
Future Volume (vph)	1	12	7	285	116	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.875			0.998		
Flt Protected	0.996			0.999		
Satd. Flow (prot)	1623	0	0	1861	1859	0
Flt Permitted	0.996			0.999		
Satd. Flow (perm)	1623	0	0	1861	1859	0
Link Speed (k/h)	50			60	60	
Link Distance (m)	77.5			270.8	169.0	
Travel Time (s)	5.6			16.2	10.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	13	8	310	126	2
Shared Lane Traffic (%)						
Lane Group Flow (vph)	14	0	0	318	128	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(m)	3.6			0.0	0.0	
Link Offset(m)	0.0			0.0	0.0	
Crosswalk Width(m)	4.8			4.8	4.8	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15	25			15
Sign Control	Stop			Free	Free	
Intersection Summary						
Area Type:	Other					
Control Type:	Unsignalized					
Intersection Capacity Utilization 30.6%	ICU Level of Service A					
Analysis Period (min) 15						

HCM Unsignalized Intersection Capacity Analysis (230561) 9408 Columbia
11: Mount Hope Road & Mount Hope Road & Proposed East-West Street L Sou2033 PM Total

	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Volume (veh/h)	1	12	7	285	116	2
Future Volume (Veh/h)	1	12	7	285	116	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	13	8	310	126	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	453	127	128			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	453	127	128			
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	99	99			
cM capacity (veh/h)	562	923	1458			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	14	318	128			
Volume Left	1	8	0			
Volume Right	13	0	2			
cSH	883	1458	1700			
Volume to Capacity	0.02	0.01	0.08			
Queue Length 95th (m)	0.4	0.1	0.0			
Control Delay (s/veh)	9.1	0.2	0.0			
Lane LOS	A	A				
Approach Delay (s/veh)	9.1	0.2	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay		0.4				
Intersection Capacity Utilization		30.6%		ICU Level of Service		A
Analysis Period (min)		15				

Measures of Effectiveness

(230561) 9408 Columbia
2033 PM Total

Network Totals

Number of Intersections	11
Total Delay (hr)	40
Stops (#)	4861
Average Speed (km/hr)	43
Total Travel Time (hr)	153
Distance Traveled (km)	6501
Fuel Consumed (l)	832
Fuel Economy (km/l)	7.8
Unserviced Vehicles (#)	0
Vehicles in dilemma zone (#)	0
Performance Index	53.4

Appendix J

Synchro Reports – 2033 Mitigations



Lanes, Volumes, Timings
1: Hwy 50 [Peel Regional Road 50] & Columbia Way
(230561) 9408 Columbia
2033 AM Total MIT

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	4	10	344	2	224	2	321	243	237	512	0
Future Volume (vph)	6	4	10	344	2	224	2	321	243	237	512	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0		0.0	65.0		0.0	136.0		300.0	85.0		25.0
Storage Lanes	0		0	1		0	1		0	1		1
Taper Length (m)	7.5			60.0			45.0			90.0		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor							1.00					
Frt		0.932			0.852			0.850				
Flt Protected		0.985		0.950			0.950		0.950			
Satd. Flow (prot)	0	1389	0	1736	1500	0	1805	1727	1524	1656	1863	1900
Flt Permitted		0.881		0.000			0.280		0.490			
Satd. Flow (perm)	0	1243	0	0	1500	0	532	1727	1524	854	1863	1900
Right Turn on Red			Yes		Yes			Yes		Yes		Yes
Satd. Flow (RTOR)		13			284				308			
Link Speed (k/h)		60			60			50			50	
Link Distance (m)		56.6			246.0			735.7			477.2	
Travel Time (s)		3.4			14.8			53.0			34.4	
Confl. Peds. (#/hr)							2					2
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	20%	67%	13%	4%	0%	8%	0%	10%	6%	9%	2%	0%
Adj. Flow (vph)	8	5	13	435	3	284	3	406	308	300	648	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	26	0	435	287	0	3	406	308	300	648	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(m)		3.6			3.6			3.6			3.6	
Link Offset(m)		0.0			0.0			0.0			0.0	
Crosswalk Width(m)		4.8			4.8			4.8			4.8	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25		15	25		15	25		15	25		15
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4!		7!	4			2			2	
Permitted Phases	4			4			2		2	2		2
Detector Phase	4	4		7	4		2	2	2	2	2	2
Switch Phase												
Minimum Initial (s)	8.0	8.0		5.0	8.0		20.0	20.0	20.0	20.0	20.0	20.0
Minimum Split (s)	25.0	25.0		9.5	25.0		30.7	30.7	30.7	30.7	30.7	30.7
Total Split (s)	25.0	25.0		25.0	25.0		35.0	35.0	35.0	35.0	35.0	35.0
Total Split (%)	41.7%	41.7%		41.7%	41.7%		58.3%	58.3%	58.3%	58.3%	58.3%	58.3%
Maximum Green (s)	19.0	19.0		20.5	19.0		28.3	28.3	28.3	28.3	28.3	28.3
Yellow Time (s)	4.0	4.0		3.5	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		1.0	2.0		2.7	2.7	2.7	2.7	2.7	2.7
Lost Time Adjust (s)		0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0		4.5	6.0		6.7	6.7	6.7	6.7	6.7	6.7
Lead/Lag												
Lead-Lag Optimize?												

Lanes, Volumes, Timings
1: Hwy 50 [Peel Regional Road 50] & Columbia Way
(230561) 9408 Columbia
2033 AM Total MIT

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Walk Time (s)	8.0	8.0		8.0	8.0		8.0	8.0	8.0	8.0	8.0	8.0
Flash Don't Walk (s)	11.0	11.0		11.0	11.0		16.0	16.0	16.0	16.0	16.0	16.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0	0	0	0	0
Act Effct Green (s)	17.0		18.5	17.0		30.3	30.3	30.3	30.3	30.3		30.3
Actuated g/C Ratio	0.28		0.31	0.28		0.51	0.51	0.51	0.51	0.51		0.51
v/c Ratio	0.07		0.81	0.46		0.01	0.47	0.33	0.70	0.69		0.69
Control Delay (s/veh)	10.9		32.7	5.1		8.5	12.5	2.5	24.1	17.0		17.0
Queue Delay	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0
Total Delay (s/veh)	10.9		32.7	5.1		8.5	12.5	2.5	24.1	17.0		17.0
LOS	B		C	A		A	B	A	C	B		B
Approach Delay (s/veh)	10.9			21.8			8.2			19.3		
Approach LOS	B			C			A			B		
Queue Length 50th (m)	1.0		43.7	0.2		0.2	30.0	0.0	26.2	56.1		
Queue Length 95th (m)	4.8		60.6	9.5		1.2	43.0	6.9	#47.6	74.7		
Internal Link Dist (m)	32.6			222.0			711.7			453.2		
Turn Bay Length (m)				65.0			136.0		300.0	85.0		
Base Capacity (vph)	402		593	669		268	873	922	431	942		
Starvation Cap Reductn	0		0	0		0	0	0	0	0		0
Spillback Cap Reductn	0		0	0		0	0	0	0	0		0
Storage Cap Reductn	0		0	0		0	0	0	0	0		0
Reduced v/c Ratio	0.06		0.73	0.43			0.01	0.47	0.33	0.70		0.69

Intersection Summary

Area Type: Other

Cycle Length: 60

Actuated Cycle Length: 60

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

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay (s/veh): 16.6

Intersection LOS: B

Intersection Capacity Utilization 85.5%

ICU Level of Service E

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

! Phase conflict between lane groups.

Splits and Phases: 1: Hwy 50 [Peel Regional Road 50] & Columbia Way



HCM Signalized Intersection Capacity Analysis (230561) 9408 Columbia
1: Hwy 50 [Peel Regional Road 50] & Columbia Way 2033 AM Total MIT

																
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR				
Lane Configurations																
Traffic Volume (vph)	6	4	10	344	2	224	2	321	243	237	512	0				
Future Volume (vph)	6	4	10	344	2	224	2	321	243	237	512	0				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900				
Total Lost time (s)		6.0		4.5	6.0		6.7	6.7	6.7	6.7	6.7					
Lane Util. Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00					
Frpb, ped/bikes		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00					
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00					
Frt		0.93		1.00	0.85		1.00	1.00	0.85	1.00	1.00					
Flt Protected		0.98		0.95	1.00		0.95	1.00	1.00	0.95	1.00					
Satd. Flow (prot)		1390		1736	1499		1804	1727	1524	1656	1863					
Flt Permitted		0.88		0.00	1.00		0.28	1.00	1.00	0.49	1.00					
Satd. Flow (perm)		1244		0	1499		532	1727	1524	854	1863					
Peak-hour factor, PHF	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79				
Adj. Flow (vph)	8	5	13	435	3	284	3	406	308	300	648	0				
RTOR Reduction (vph)	0	9	0	0	204	0	0	0	152	0	0	0				
Lane Group Flow (vph)	0	17	0	435	83	0	3	406	156	300	648	0				
Confl. Peds. (#/hr)							2					2				
Heavy Vehicles (%)	20%	67%	13%	4%	0%	8%	0%	10%	6%	9%	2%	0%				
Turn Type	Perm	NA		pm+pt	NA		Perm	NA	Perm	Perm	NA	Perm				
Protected Phases		4!		7!	4			2			2					
Permitted Phases	4			4			2		2	2		2				
Actuated Green, G (s)		17.0		18.5	17.0		30.3	30.3	30.3	30.3	30.3					
Effective Green, g (s)		17.0		18.5	17.0		30.3	30.3	30.3	30.3	30.3					
Actuated g/C Ratio		0.28		0.31	0.28		0.51	0.51	0.51	0.51	0.51					
Clearance Time (s)		6.0		4.5	6.0		6.7	6.7	6.7	6.7	6.7					
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0					
Lane Grp Cap (vph)		352		535	424		268	872	769	431	940					
v/s Ratio Prot				c0.25	0.06			0.24			0.35					
v/s Ratio Perm		0.01					0.01		0.10	c0.35						
v/c Ratio		0.05		0.81	0.20		0.01	0.47	0.20	0.70	0.69					
Uniform Delay, d1		15.6		19.2	16.3		7.4	9.6	8.2	11.3	11.3					
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00					
Incremental Delay, d2		0.1		9.2	0.2		0.1	1.8	0.6	9.0	4.1					
Delay (s)		15.7		28.3	16.5		7.5	11.4	8.8	20.3	15.4					
Level of Service		B		C	B		A	B	A	C	B					
Approach Delay (s/veh)		15.7			23.7			10.3			17.0					
Approach LOS		B			C			B			B					
Intersection Summary																
HCM 2000 Control Delay (s/veh)			17.0		HCM 2000 Level of Service					B						
HCM 2000 Volume to Capacity ratio			0.76													
Actuated Cycle Length (s)			60.0		Sum of lost time (s)					12.7						
Intersection Capacity Utilization			85.5%		ICU Level of Service					E						
Analysis Period (min)			15													
! Phase conflict between lane groups.																
c Critical Lane Group																

Appendix K

Traffic Signal Warrant



Signal Justification Calculation for Forecast Volumes (OTM Book 12 - Justification 7)



Horizon Year: 2033
Region/City/Township: Town of Caledon

Major Street: Columbia Way
Minor Street: Westchester Road/Proposed No

North/South?: N

Number of Approach Lanes: 1
Tee Intersection?: N
Flow Conditions: Restricted

PM Forecast Only? N

Warrant Results		
150% Satisfied	No	Justification for new intersections with forecast traffic
120% Satisfied	No	Justification for existing intersections with forecast traffic

Time Period	Major Street						Minor Street						Peds Crossing
	Columbia Way						Westchester Road/Proposed North-South Street A						
	Eastbound			Westbound			Northbound			Southbound			
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
AM Peak Hour	95	0	71	146	0	60	18	262	62	62	327	24	3
PM Peak Hour	48	0	37	86	0	101	93	219	69	48	166	208	6
verage Hourly Volum	36	0	27	58	0	40	28	120	33	28	123	58	2

Warrant	AHV
1A - All	551
1B - Minor	390
2A - Major	161
2B - Cross	181

Warrant 1 - Minimum Vehicular Volume

1A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	All Approaches	480	720	600	900	551
% Fulfilled						76.5%

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Minor Street Approaches	120	170	120	170	390
% Fulfilled						229.1%

Warrant 2 - Delay To Cross Traffic

2A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Major Street Approaches	480	720	600	900	161
% Fulfilled						22.4%

2B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Traffic Crossing Major Street	50	75	50	75	181
% Fulfilled						241.0%

Signal Justification Calculation for Forecast Volumes (OTM Book 12 - Justification 7)



Horizon Year: 2033
Region/City/Township: Town of Caledon

Major Street: Columbia Way
Minor Street: Mount Hope Road

North/South?: N

Number of Approach Lanes: 1
Tee Intersection?: N
Flow Conditions: Restricted

PM Forecast Only? N

Warrant Results		
150% Satisfied	No	Justification for new intersections with forecast traffic
120% Satisfied	No	Justification for existing intersections with forecast traffic

Time Period	Major Street Columbia Way						Minor Street Mount Hope Road						Peds Crossing
	Eastbound			Westbound			Northbound			Southbound			
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
AM Peak Hour	65	10	26	161	5	102	85	372	21	1	262	26	0
PM Peak Hour	23	6	11	44	9	55	67	249	50	20	337	170	11
verage Hourly Volum	22	4	9	51	4	39	38	155	18	5	150	49	3

Warrant	AHV
1A - All	544
1B - Minor	415
2A - Major	129
2B - Cross	201

Warrant 1 - Minimum Vehicular Volume

1A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	All Approaches	480	720	600	900	
						% Fulfilled
						75.6%

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Minor Street Approaches	120	170	120	170	
						% Fulfilled
						244.1%

Warrant 2 - Delay To Cross Traffic

2A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Major Street Approaches	480	720	600	900	
						% Fulfilled
						18.0%

2B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Traffic Crossing Major Street	50	75	50	75	
						% Fulfilled
						268.3%

Signal Justification Calculation for Forecast Volumes (OTM Book 12 - Justification 7)



Horizon Year: 2033
Region/City/Township: Town of Caledon

Major Street: Caledon-King Townline South
Minor Street: Columbia Way

North/South?: Y

Number of Approach Lanes: 1
Tee Intersection?: Y
Flow Conditions: Restricted

PM Forecast Only? N

Warrant Results		
150% Satisfied	No	Justification for new intersections with forecast traffic
120% Satisfied	No	Justification for existing intersections with forecast traffic

Time Period	Major Street						Minor Street						Peds Crossing
	Caledon-King Townline South						Columbia Way						
	Northbound			Southbound			Eastbound			Westbound			
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	
AM Peak Hour	144	141	0	0	647	57	59	0	541	0	0	0	0
PM Peak Hour	184	555	0	0	320	361	111	0	134	0	0	0	0
verage Hourly Volum	82	174	0	0	242	105	43	0	169	0	0	0	0

Warrant	AHV
1A - All	814
1B - Minor	211
2A - Major	602
2B - Cross	43

Warrant 1 - Minimum Vehicular Volume

1A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	All Approaches	480	720	600	900	
% Fulfilled						113.0%

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Minor Street Approaches	180	255	180	255	
% Fulfilled						82.8%

Warrant 2 - Delay To Cross Traffic

2A	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Major Street Approaches	480	720	600	900	
% Fulfilled						83.6%

2B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Traffic Crossing Major Street	50	75	50	75	
% Fulfilled						56.7%