Westwood Village Phase 2
Transportation Impact Study

Paradigm Transportation Solutions Limited

April 2021
Project No.: 180321

ptsl.com

Project Summary

Westwood Village Phase 2 Transportation Impact Study

Project Number
180312

April 2021

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Executive Summary

Content

Paradigm Transportation Solutions Limited was retained by Hallman Construction Limited and Brian Domm to conduct this Transportation Impact Study (TIS) as part of a continuation to the previous Westwood Village (Phase 1) Community TIS[1] (previously referred to as Cambridge West Community).

New subdivision plans for Westwood Village Phase 2, which was previously referred to as "Additional Lands" in the previous Westwood Village (Phase 1) Community TIS, has been issued for review. The impact assessment includes an analysis existing traffic conditions, describes the proposed development, forecasts traffic to a 2031 horizon, and recommends improvements to mitigate future traffic conditions. This report also includes a comparison of the conclusions and recommendations from the previous Westwood Village (Phase 1) Community TIS to the findings of this TIS.

Proposed Development

The development is located in the Township of North Dumfries, immediately west of the Westwood Village (Phase 1) Community.

The development is proposed to have the following number of units:

- between 319 and 382 single family units; and
- between 111 and 274 townhouses.

The high-end number of units is used in the analyses contained within this report.

Compared to the "Additional Lands" assumptions in the previous Westwood Village (Phase 1) Community TIS, this is an increase of 62 single family units and 160 townhouses.

Access to the development will be provided entirely through the Westwood Village (Phase 1) Community, connecting to the extension of Newman Drive.

[1] Cambridge West Community; Transportation Impact Study, *Paradigm Transportation Solutions Limited*, July 2019

Conclusions

Based on the investigations carried out, the study has reached the following conclusions:

- Westwood Village Phase 2 is forecast to generate 361 and 462 vehicle trips during the AM and PM peak hour, respectively;
- **Table 6.1** summarizes the movements where levels of service and/or capacity thresholds could be exceeded that warrant mitigation or improvements;
- Left-turn Lanes are warranted at the intersections of:
  - **Roseville Road and Edworthy Sideroad (westbound):** 15 metres of storage length is warranted by 2031 background traffic conditions, regardless of whether the subject development.
  - **Blenheim Road and Parkwood Drive (westbound):** 65 metres of storage length is warranted by 2031 background traffic conditions, regardless of whether the subject development. An additional 10 metres of storage length is warranted by the 2031 total traffic conditions.
  - **Blenheim Road and Blair Road (eastbound):** 50 metres of storage length is warranted by 2031 background traffic conditions, regardless of whether the subject development. An additional 20 metres of storage length is warranted by the 2031 total traffic conditions.

TABLE ES.1: SUMMARY OF MOVEMENTS OF INTEREST AND WARRANTED IMPROVEMENTS

Intersection	No.	Issue / Remediation Type	Scenairo	
			Background - including Westwood Village (Phase 1) Community	Total - Westwood Village (Phase 2) Community
Blair Road and George Street North (North)	1	Identified Movement of Interest[1]	NBLT	NBLT
		Warranted Improvements	None	None
		Discussion and Recommendation	Region staff review traffic control	Region staff review traffic control
Park Hill Road and Water Street	4	Identified Movement of Interest[1]	EBLT, NBLT and SBRT	None
		Warranted Improvements	None	None
		Discussion and Recommendation	See Section 4.0.2	
Park Hill Road and Ainslie Street	5	Identified Movement of Interest[1]	EBLT	None
		Warranted Improvements	None	None
		Discussion and Recommendation	See Section 4.0.2	
Roseville Road and Edworthy Side Road	6	Identified Movement of Interest[1]	NBLT	NBLT
		Warranted Improvements	None	15 meter westbound LTL
		Discussion and Recommendation	Region staff review traffic control	Region staff review traffic control
Blenheim Road and Parkwood Drive	7	Identified Movement of Interest[1]	NBLT	NBLT
		Warranted Improvements	None	75 meter westbound LTL
		Discussion and Recommendation	Region staff review traffic control	Region staff review traffic control
Blenheim Road and Blair Road	8	Identified Movement of Interest[1]	SBLT	SBLT
		Warranted Improvements	None	65 meter eastbound LTL
		Discussion and Recommendation	Region staff review traffic control	Region staff review traffic control
Blair Road and George Street North (South)	9	Identified Movement of Interest[1]	EBA, WBA, NBA and SBA	EBA, WBA, NBA and SBA
		Warranted Improvements	None	None
		Discussion and Recommendation	Region staff review traffic control	Region staff review traffic control

1 - Movements identified as operating at LOS E or F

Recommendations

This study has identified the following improvements to the transportation network related to the Westwood Village Phase 2 development:

- **Blair Road and George Street North (North Intersection):** It is recommended that the Region of Waterloo continue to review the need for enhanced traffic control at this intersection at appropriate intervals;
- **Roseville Road and Edworthy Side Road:** It is recommended that an auxiliary westbound left-turn lane with a 15 metre storage length be constructed, regardless of whether the subject development is built;
- **Blenheim Road and Parkwood Drive:** It is recommended that an auxiliary westbound left-turn lane with a 75 metre storage length be constructed. 65 metres of the storage length is warranted regardless of whether the subject development is built;
- **Blenheim Road and Blair Road:** It is recommended that an auxiliary eastbound left-turn lane with a 70 metre storage length be constructed. 50 metres of the storage length is warranted regardless of whether the subject development is built; and
- **Blair Road and George Street North (9):** It is recommended that the Region of Waterloo continue to review the need for enhanced traffic control at this intersection at appropriate intervals.

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1 Introduction

1.1 Overview

Paradigm Transportation Solutions Limited was retained by Hallman Construction Limited and Brian Domm to conduct this Transportation Impact Study (TIS) for a proposed Westwood Village Phase 2 residential development. This development is located in the Township of North Dumfries, immediately west of the Westwood Village (Phase 1) Community (previously referred to as Cambridge West Community Plan). This development was previously considered in the Westwood Village (Phase 1) Community TIS as "Additional Lands".

Access to the development will be provided entirely through the Westwood Village (Phase 1) Community, connecting to the extension of Newman Drive.

1.2 Westwood Village (Phase 1) Community

The Westwood Village (Phase 1) Community TIS[2] was completed by Paradigm in July 2019 to evaluate the transportation impacts of the proposed development, including Westwood Village Phase 2, which was referred to as "Additional Lands". The study concluded that the Westwood Village (Phase 1) Community could be accommodated by the transportation network with the following recommendations:

- For the Region of Waterloo to continue monitoring the intersection of Blair Road and George Street North (North Intersection) to review the need for enhanced traffic control.
- Lane reconfigurations at the intersections of Park Hill Road West and Water Street North, and Park Hill Road West and Ainslie Street North.
- A roundabout be constructed at the intersection of the realigned Blenheim Road and the extension of Bismark Drive.
- A westbound left-turn lane with 25 metres of storage length on Blenheim Road at what was referred to as Street G.

The July 2019 TIS assumed the development of the "Additional Lands" would include 320 single detached homes and 114 townhouses. With the traffic generated by the "Additional Lands", the Cambridge West TIS noted that the intersection of Blair Road and George Street North (South Intersection) is forecast to warrant a signal at the assumed level

[2] Cambridge West Community: Transportation Impact Study, *Paradigm Transportation Solutions Limited,* July 2019

of development and should be further analysed in the TIS specific for the Additional Lands. No further improvements were anticipated.

The TIS for Westwood Village Phase 1 was approved by the Region of Waterloo and City of Cambridge.

1.3 Study Purpose

Paradigm has been retained by the landowners to conduct this Transportation Impact Study for the Westwood Village Phase 2 development. This study has been prepared in accordance with the requirements detailed by the Regional Municipality of Waterloo (RMOW or Region) in its Transportation Impact Study Guidelines[3]. It is noted that the City of Cambridge (City) and Township of North Dumfries (Township) also follow these guidelines and supplements with additional requirements of its own, through their TIS guidelines. The City, Township and the Region were consulted in accordance with the requirements of the process to confirm the study scope. A pre-study consultation was held to confirm the required scope of work. **Appendix A** contains the detailed pre-study conference notes.

The purpose of the study is to determine the impact of the development traffic on the surrounding road network and the improvements required to accommodate this future traffic. The scope of the study includes determination of the current traffic and site conditions in the vicinity of the proposed development, estimates of background traffic growth in the area, estimates of the additional traffic that will be generated by the development, analyses of the impact of the additional traffic and recommendations on the remedial measures necessary to accommodate the future traffic in a satisfactory manner.

1.4 Study Terms of Reference and Scope

Based on the consultation with City, Township and Regional staff, the following assumptions guided the development of this report:

- The analysis horizon will use the same ultimate horizon year from the Westwood Village (Phase 1) Community TIS (2031); and
- AM and PM peak hours were analyzed to assess traffic operations.

The study area would include the following intersections:

[3] Transportation Impact Study Guidelines, *Regional Municipality of Waterloo*, July 2014

- Blair Road & George Street North (North) (1);
- Blair Road & Princess Street (2);
- Blair Road & Bismark Drive (3);
- Water Street & Park Hill Road (4);
- Ainslie Street & Park Hill Road (5);
- Roseville Road & Edworthy Side Road (6);
- Blenheim Road & Parkwood Drive (7);
- Blair Road & Blenheim Road (8); and
- Blair Road & George Street North (South) (9).

The inclusion of the intersections noted above were based on the outcome of the Westwood Village (Phase 1) Community TIS and included the intersections for which improvements were recommended, or for which had movements forecast to have operational issues.

Figure 1.1 details the locations of these intersections, including the location of the subject development.

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Study Area and Subject Development Location

Westwood Village Phase 2
180312

Figure 1.1

2 Existing Conditions

This section documents current traffic conditions, operational deficiencies, and constraints experienced by the public travelling within the study area.

2.1 Existing Road Network

The primary roads within the study area include:

- **Water Street** is a two-lane Regional arterial road south of its intersection with Ainslie Street, north of this intersection it is a four-lane road. The posted speed limit within the study area is 50 km/hr. It provides access to the south and west including Paris, Brantford and Highway 403 and to the north including downtown Cambridge, central Cambridge and Highway 401;
- **Ainslie Street** is a two-lane Regional arterial road south of its intersection with Water Street. The posted speed limit within the study area is 50 km/hr. It provides access to the south and west including Paris, Brantford and Highway 403 and to the north including downtown Cambridge, central Cambridge and Highway 401;
- **George Street North** is a two-lane Regional Arterial road. The posted speed limit within the study area is 60 km/hr between Blair Road and Sunset Boulevard, and 50 km/hr to the south of Sunset Boulevard. George Street North ends within the study area at Blair Road. George Street links Blair Road to Downtown Cambridge and provides access to the north onto Highway 401, north and west Cambridge, and Kitchener.
- **Blair Road** is a two-lane road. According to the City of Cambridge Official Plan[4], Blair Road is classed as a collector road within the City Limits south of its intersection with George Street North. North of this location it is classed as an arterial road. The posted speed limit within the study area is 50 km/hr. Blair Road provides access to the north onto Highway 401, north and west Cambridge, and Kitchener. Blair Road ends within the study area at Blenheim Road.
- **Park Hill Road** is a four-lane Regional arterial road between George Street North and Ainslie Street North. The posted speed limit within the study area is 50 km/hr. Park Hill Road links West Cambridge to Downtown Cambridge.

[4] City of Cambridge Official Plan, Map 7A, page 246, City of Cambridge. 2013

- **Blenheim Road** is a two-lane collector road. The posted speed limit within City of Cambridge in the study area is 50 km/hr, to the west in the Township of North Dumfries through Brown's subdivision it is posted at 60 km/h and further west (west of Edworthy Side Road) increases to 80 km/h. Blenheim Road provides access to the west and north (Highway 401, north and west Cambridge, and Kitchener) and to the east (Downtown Cambridge, Central Cambridge, Highway 24, Franklin Boulevard and Highway 401).

It is noted that the realignment of Blenheim Road and Bismark Drive, and the construction of the roundabout at the intersection of these two roads are currently underway. These improvements will be considered under all future analysis.

The following streets are classified as City of Cambridge collector streets within the study area. These streets function to provide access to the surrounding Regional arterial road network from the adjacent land uses:

- Princess Street (Rosslinn to Blair);
- Bismark Drive (Rosslinn to Blair); and
- Parkhill Road West (Blair Road to George Street).

The study area is primarily bordered by residential developments to north, south and east. Further to the east is downtown Galt and commercial developments. To the west are primarily agricultural lands within the Township of North Dumfries.

Figure 2.1 displays the existing lane configuration and traffic controls of intersections within the study area.

2.2 Existing Pedestrian & Cyclist Facilities

Within the Study Area sidewalks currently exist on both sides of Westcliff Way, Newman Drive, Princess Street, and Bismark Drive and only on one side of Blair Road. Sidewalks are planned in the Westwood Village (Phase 1) Community.

There are no dedicated on-road cycling facilities within the Study Area. The Devil's Creek Trail, an off-road facility, travels north-south through the eastern end of the study area. The trail crosses Bismark Drive between Leslie Avenue and Blair Road and then crosses Blair Road between Clearview Drive and Esther Avenue. Since the subject lands and the Westwood Village (Phase 1) Community are currently undeveloped, no sidewalks or trails have been built on them.

2.3 Existing Transit Service

The subject lands are not currently serviced by Grand River Transit. However, the Phase 1 and Phase 2 communities are planned to exceed the minimum greenfield density targets to support the introduction/extension of transit to the community.

Figure 2.2 displays the following routes which GRT serves in the wider study area:

- **iXpress/iON Bus** services the King Street corridor throughout Kitchener and Waterloo via King Street and on to Cambridge, and operates on 15-minute headways; and
- **Route 57** runs from the Ainslie Street terminal in downtown Galt, along Blair Road and Westcliff Way and operates on 30-minute headways.

2.4 Existing Traffic Volumes

Paradigm Transportation Solutions Limited collected traffic volume data during October 2018 for the intersections within the study area.

Figure 2.3 and **Figure 2.4** shown the existing AM and PM peak hour traffic volumes, respectively.

1. Laurelwood Drive and Bearinger Road/Fisher Hallman Road
2. Conservation Drive and Westmount Road
3. Benjamin Road and Westmount Road
4. Benjamin Road and Kressler Road
5. Erbsville Road and Kressler Road
6. Erbsville Road and Conservation Drive
7. Erbsville Road and Laurelwood Drive
8. Beaver Creek Road and Laurelwood Drive
9. Benjamin Road and Bisch Street

Westwood Village (Phase 2) Development Area

Westwood Village (Phase 1) Community

George Street North

Bismark Drive

Blair Road

Roseville Road

Blenheim Road

Park Hill Road

N

Existing Lane Configurations and Traffic Control

Figure 2.1

Westwood Village Phase 2
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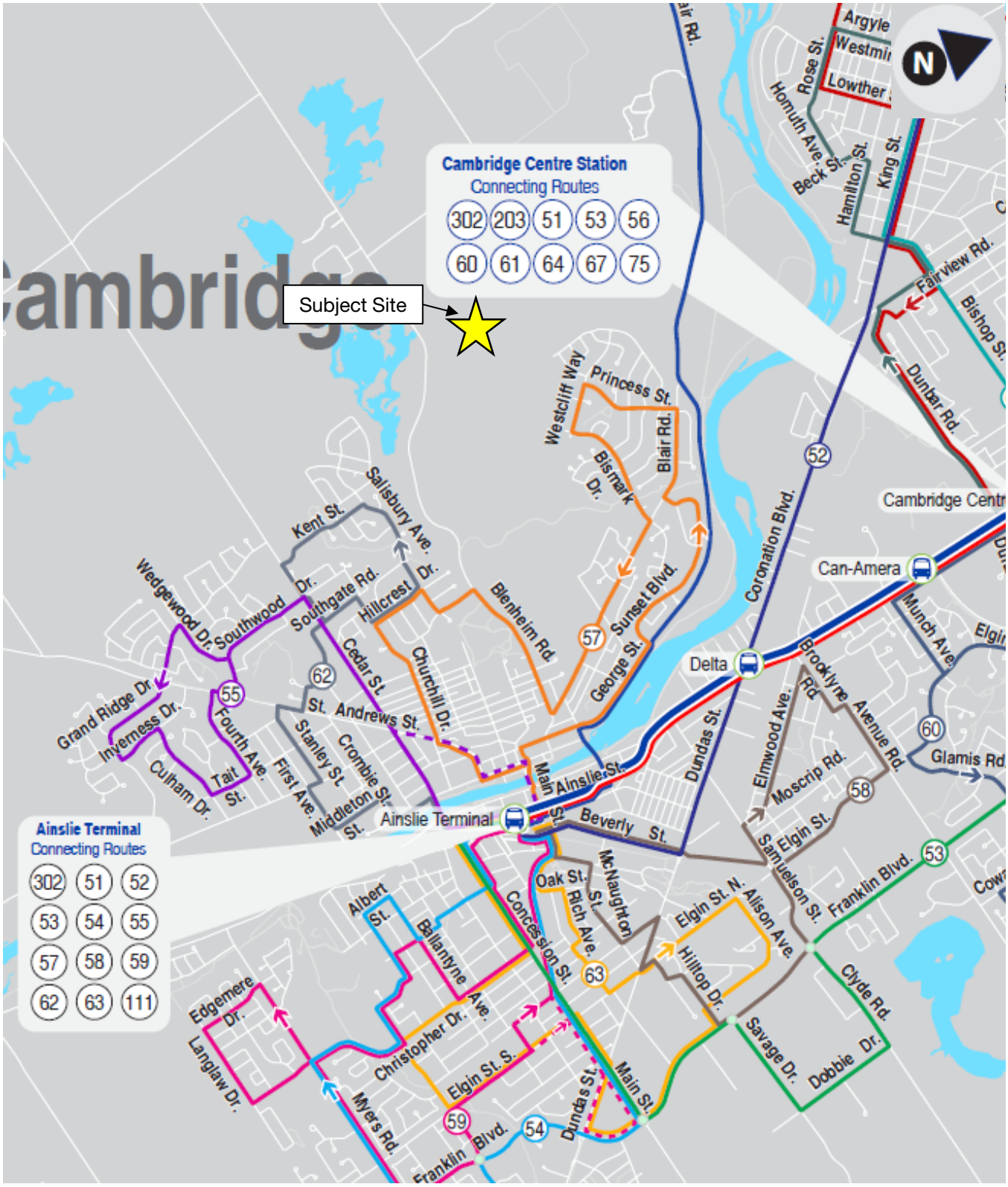

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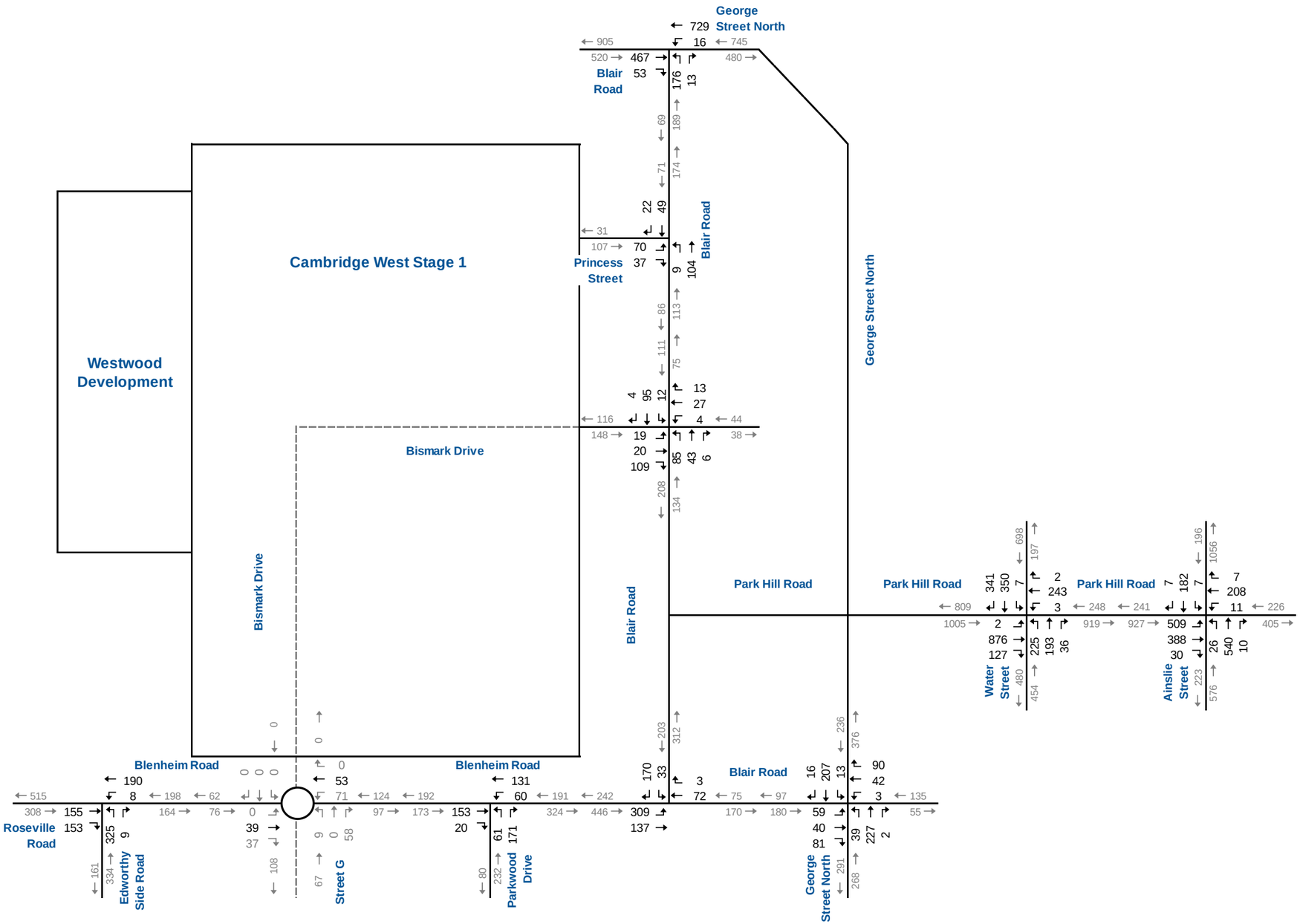
Existing Transit Network

Westwood Village Phase 2
180312

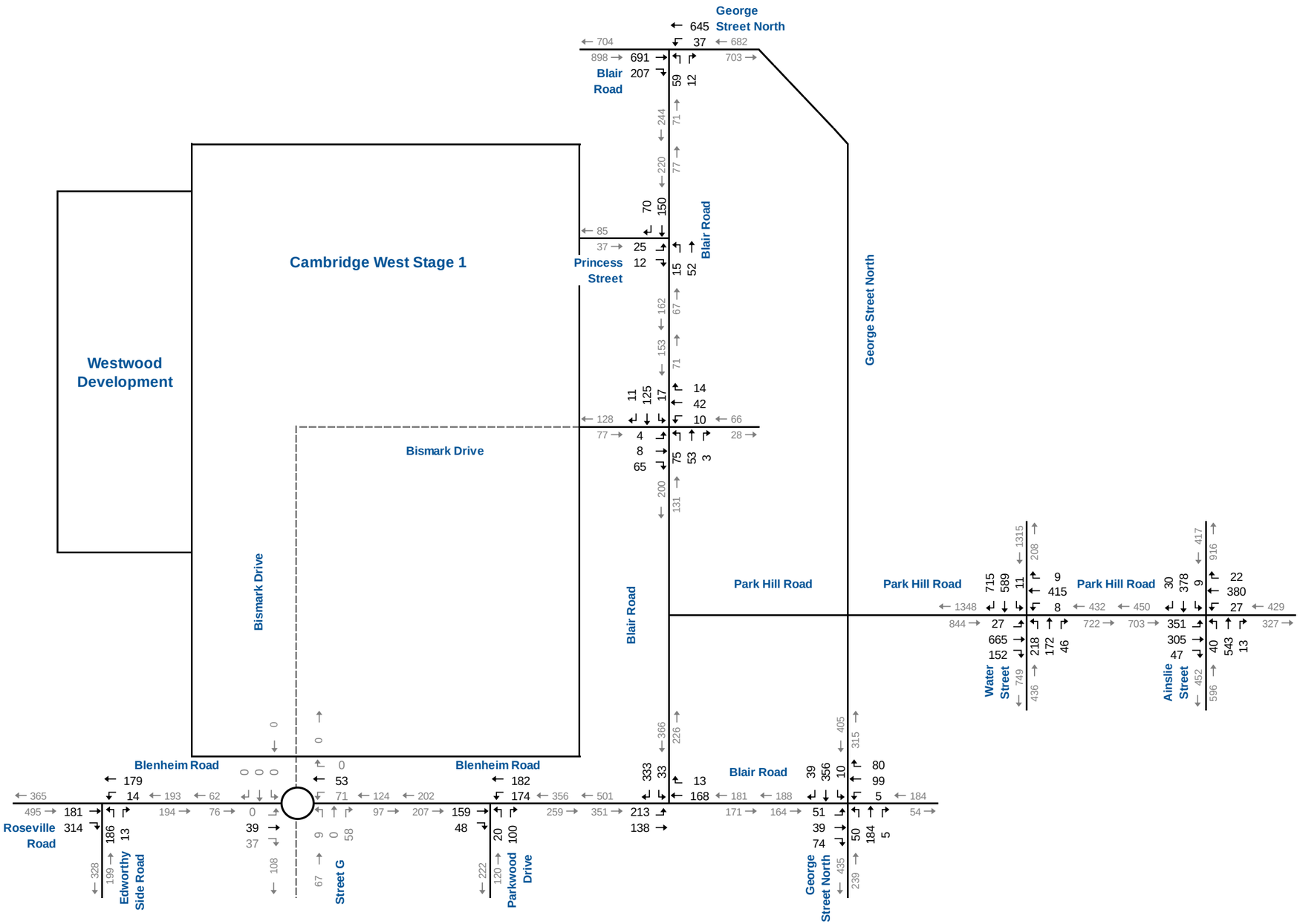
Figure 2.2



Existing Traffic Volumes – AM Peak

Figure 2.3

Westwood Village Phase 2
180312



Existing Traffic Volumes – PM Peak

Figure 2.4

2.5 Intersection Operational Assessments

The operations of the intersections in the study area were evaluated using the existing lane configurations, traffic controls and the existing traffic peak volumes.

Intersection level of service (LOS) is a recognized method of quantifying the efficiency of traffic flow at intersections. It is based on the delay experienced by individual vehicles executing the various movements. The delay is related to the number of vehicles desiring to make a particular movement, compared to the estimated capacity for that movement. The capacity is based on a number of criteria related to the opposing traffic flows. The highest possible rating is LOS A, under which the average total delay is equal or less than 10.0 seconds per vehicle. When the average delay exceeds 80 seconds at signalized intersections (50 seconds at unsignalized intersections), the movement is considered to have a LOS F and remedial measures are usually implemented, if they are feasible.

The level of service conditions on the existing road network have been assessed using Synchro 10. The criteria, as defined by the Region of Waterloo, for identifying “critical” intersections are:

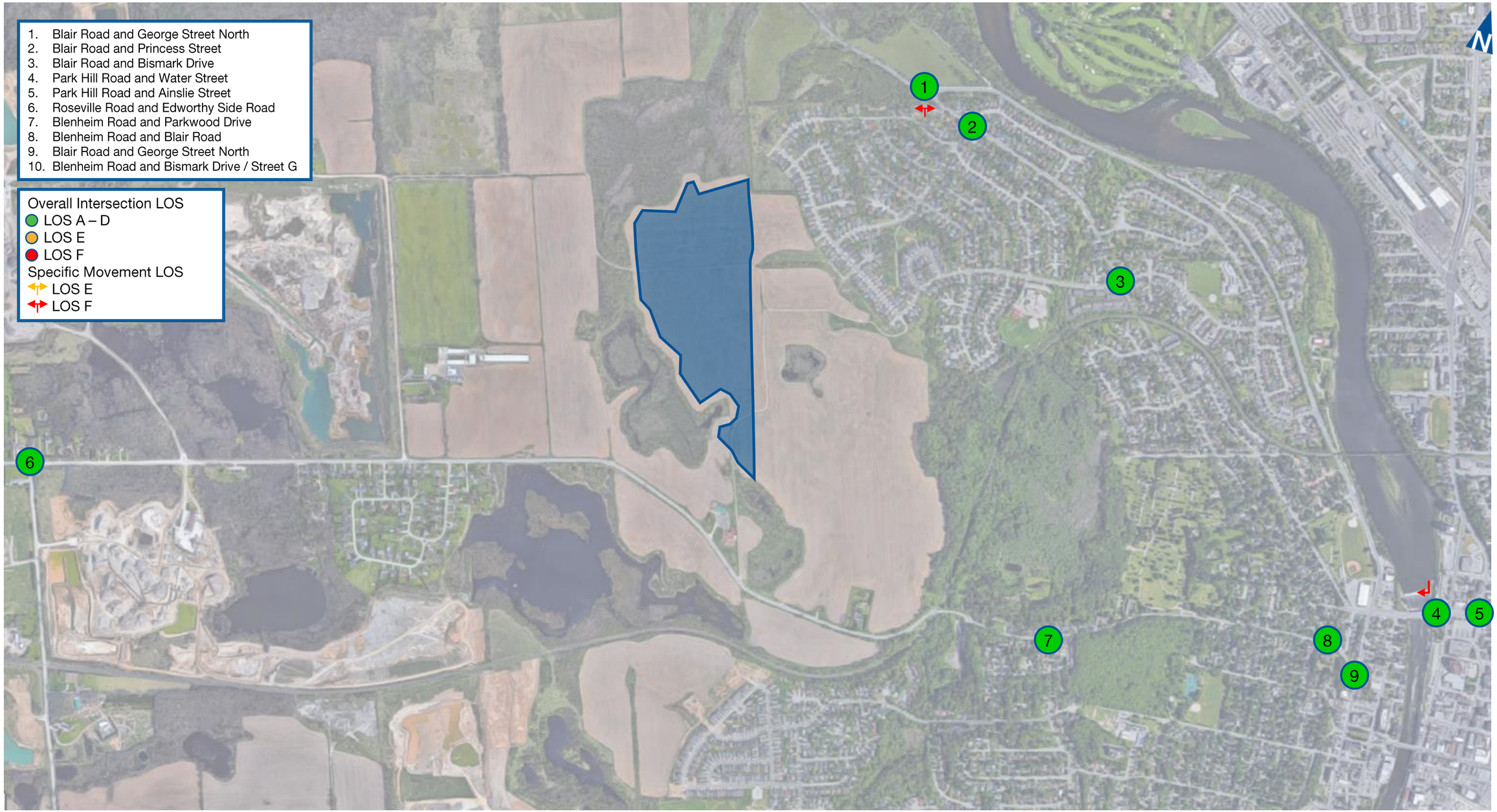
- overall Level of Service E or F (i.e. average control delay per vehicle greater than 55 seconds) for signalized intersections; and
- overall Level of Service E or F (i.e. average control delay per vehicle greater than 35 seconds) for unsignalized intersections.

As well, the criteria for identifying individual “critical” movements are:

- the average control delay for individual movements is greater that 55 seconds;
- estimated 95th percentile queue length for an exclusive movement exceeds the available storage space;
- estimated 95th percentile queue length for an individual movement will block an existing access;
- exclusive turning lanes are inaccessible because of queue lengths in adjacent through lanes; and
- poor quality of service for non-auto modes.

Figure 2.5 and **Figure 2.6** summarizes the level of service and other performance results during the AM and PM peak hours, respectively. **Appendix B** contains the detailed Synchro reports.

The analyses indicate that all intersections and individual movements within the study area are currently operating at acceptable levels of service.



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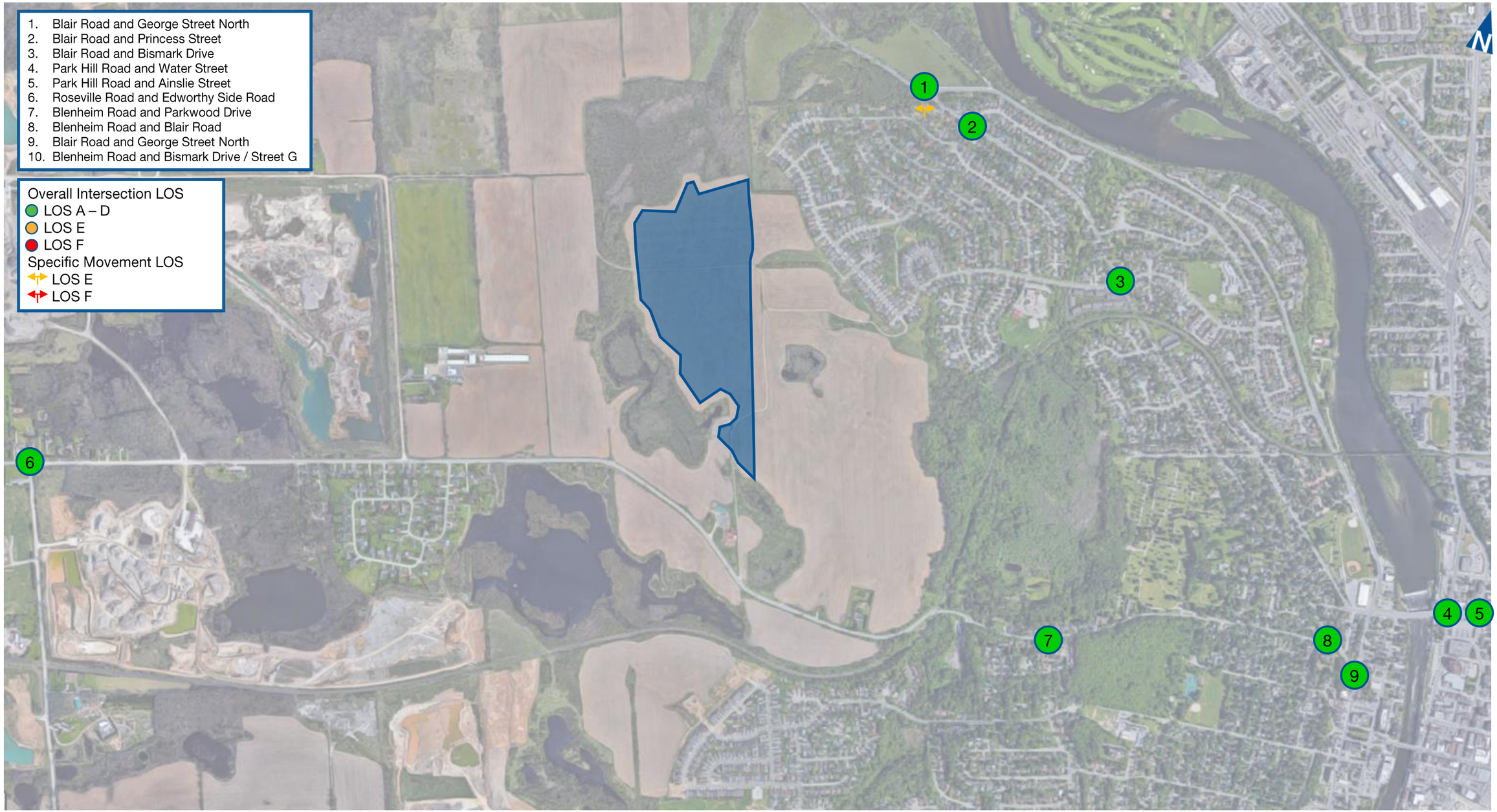
Existing Traffic Operations – AM Peak

Westwood Village Phase 2
180312

Figure 2.5



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Existing Traffic Operations – PM Peak

Westwood Village Phase 2
180312

Figure 2.6

3 Development Concept

3.1 Development Description

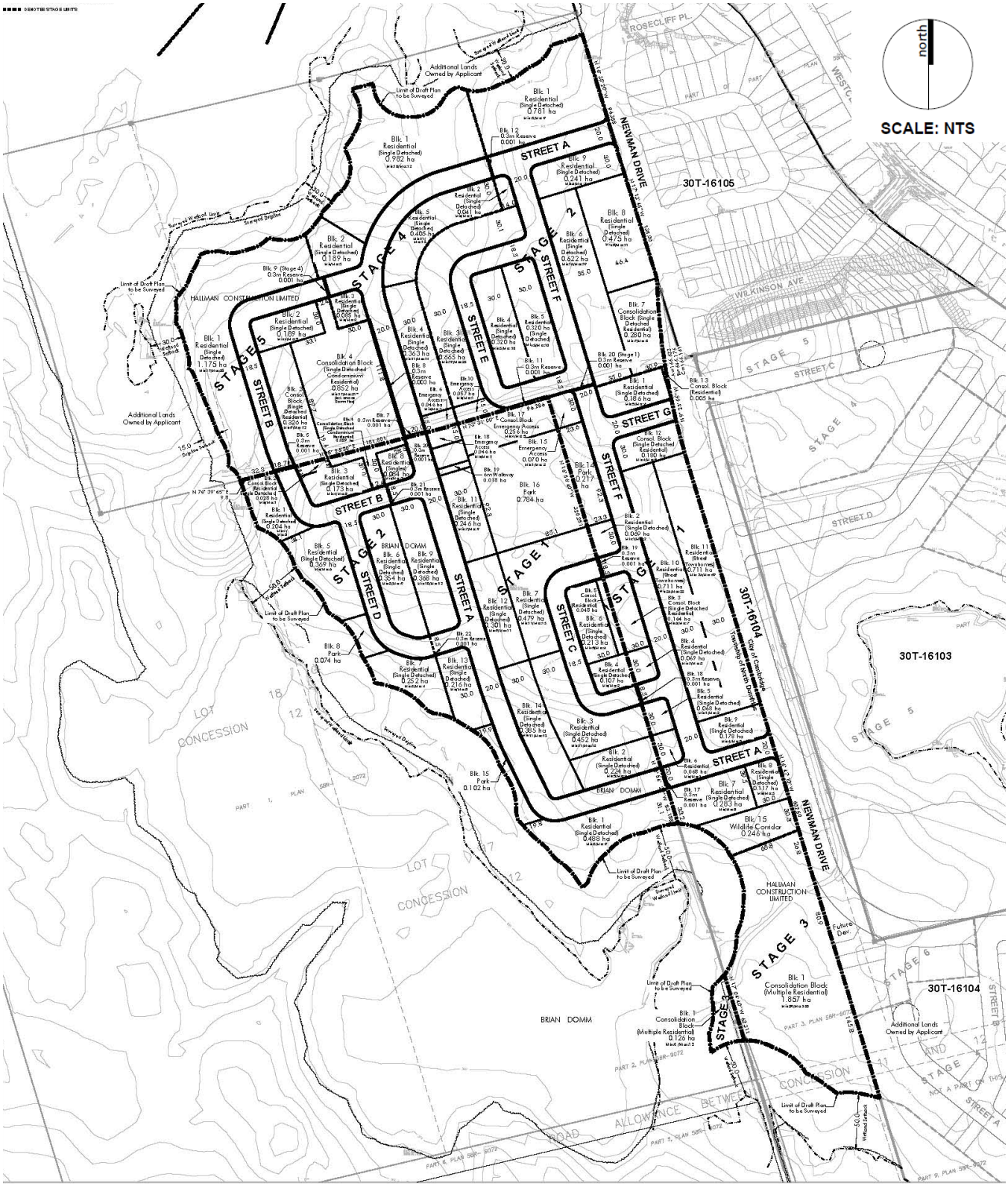
The subject development consists of multiple housing blocks, for a total of:

- between 319 and 382 single family units; and
- between 111 and 274 townhouses.

For the purposes of analyses, the high-end number of units is used in this report and thus should be considered a conservative approach to forecasting trips generated by the development. The difference between the high-end number of units and what was assumed in the July 2019 TIS for Westwood Village (Phase 1) is 62 single family units and 160 townhouse units.

Access to the development will be provided entirely through the Westwood Village (Phase 1) Community and the proposed subdivisions will connect directly to the extension of Newman Drive.

Figure 3.1 shows the proposed site plan.



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Proposed Subdivision Plans

Westwood Village Phase 2
180312

Figure 3.1

3.2 Trip Generation

The Institute of Transportation Engineers (ITE) Trip Generation rates and equations were used to estimate the peak hour site-generate traffic volumes. Land Use Codes (LUC) 210 (Single-Family Detached Housing) and 220 (Low-Rise Apartment) were used in this study. This results in 361 and 462 new trips forecast to be generated in the AM and PM peaks, respectively. This is 104 and 123 additional trips compared to the assumed development in the Westwood Village (Phase 1) Community TIS.

- **LUC 210 (Single-Family Detached Housing):** Single-family detached housing includes all single-family detached homes on individual lots.
- **LUC 220 (Multifamily Housing (Low-Rise)):** Low-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have one or two levels (floors).

For the purposes of forecasting in this study, full buildout of the site is forecast to occur by 2031.

TABLE 3.1: TRIP GENERATION

Land Use Code	Units	AM Peak Hour				PM Peak Hour			
		Rate	In	Out	Total	Rate	In	Out	Total
210: Single-Family Detached Housing	382 Units	*	69	207	276	**	232	136	368
220: Multifamily Housing (Low-Rise)	274 Units	***	29	96	125	****	91	54	145
Total Trips			*98*	*303*	*401*		*323*	*190*	*513*
Total Mode Share Reductions		*10%*	*10*	*30*	*40*	*10%*	*32*	*19*	*51*
Total Net Trips			***88***	***273***	***361***		***291***	***171***	***462***

** Trip = 0.71X + 4.80* **** Ln(Trip) = 0.95Ln(X) - 0.51*
*** Ln(Trip) = 0.96Ln(X) + 0.20* ***** Ln(Trip) = 0.89Ln(X) - 0.02*

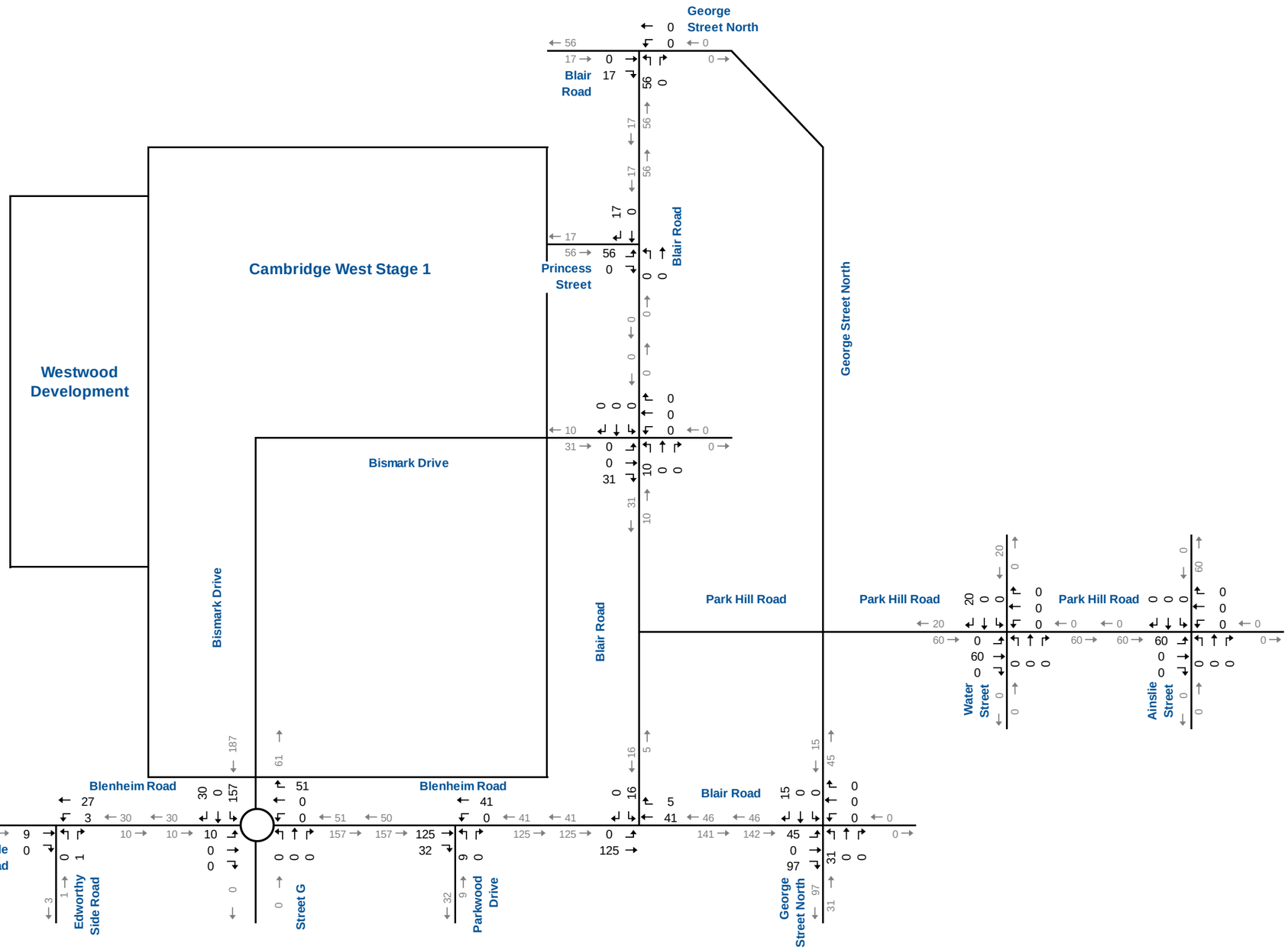
3.3 Trip Distribution and Assignment

The Westwood Village (Phase 1) Community TIS trip distribution, determined using the Transportation Tomorrow Survey (TTS) for the likely distribution of trips to / from the subject site, was used to determine the trip distribution for this TIS. **Table 3.2** summarizes the TTS trip distribution. The distribution is the same as what was used in the Westwood Village (Phase 1) Community TIS.

TABLE 3.2: TRIP DISTRIBUTION

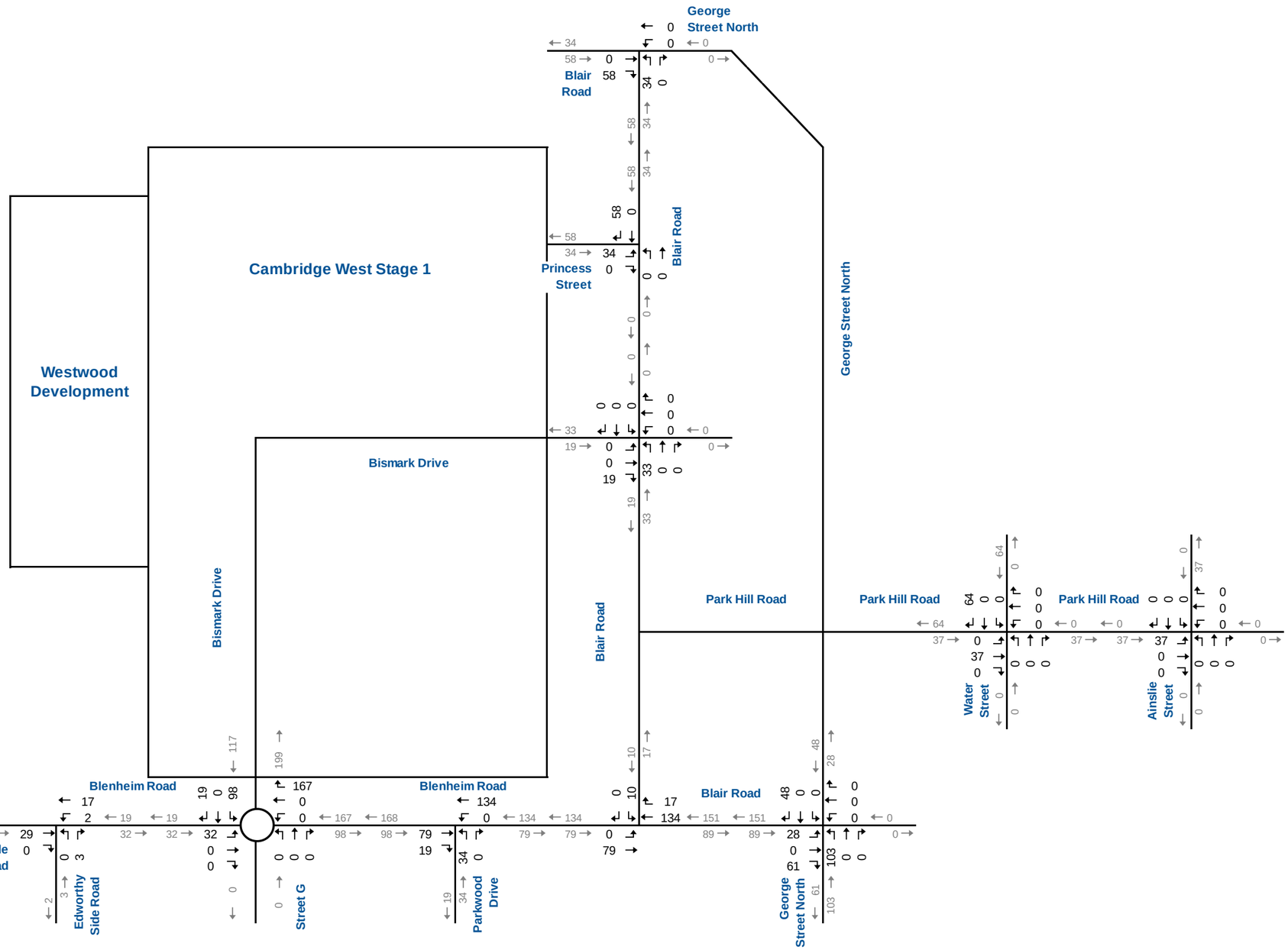
Direction	Distribution
North via George Street	20%
North via Ainslie/Water	22%
South via George Street	24%
West via Roseville Road	11%
Internal Roads	23%
Total	***100%***

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



Site Generated Traffic Volumes – AM Peak

Figure 3.2



Site Generated Traffic Volumes – PM Peak

Figure 3.3

4 Evaluation of Future Traffic Conditions

Future traffic conditions assessed include estimates of future background and total traffic analysis for the 2031 horizon. The future traffic volumes near the development will likely consist of increased non-site traffic volumes (background traffic), and the traffic forecast to be generated by the proposed development. The background growth rate used in this study is the same as what was used in the Westwood Village (Phase 1) Community TIS, which was confirmed in the pre-study consultation. The growth rate on Blenheim Road is assumed to be 1.5% per year and the growth rate in the remainder of the study area was assumed to be 0.5%. These rates were based on the recommendations of the Region of Waterloo, based on their transportation model for the area.

4.0.1 Background Development Traffic

Trips generated by the Westwood Village (Phase 1) Community and the background developments discussed in that TIS were included in the background development traffic for this study.

Also included in the background traffic were forecasts for additional growth in the Downtown Galt area to account for an additional 382 person, specifically from the Gaslight development. This additional growth was also included in the background traffic forecasts of the Westwood Village (Phase 1) Community TIS.

Figure 4.1 displays the Westwood Village (Phase 1) Community Area.

4.0.2 Background Intersection Improvements

As noted in **Section 3**, the intersection of **Blenheim Road and Bismark Drive / Street G** is proposed as a roundabout intersection and is planned to be constructed under the Westwood Village (Phase 1) Community. As such, it will be considered as a roundabout intersection for the 2031 background and total traffic horizons.

Additionally, as the Westwood Village (Phase 1) Community TIS was approved, the intersection improvements recommended are assumed to be implemented as a part of the 2031 future conditions. Specifically, the improvements of:

- **Water Street and Park Hill Road:** Reconfigure the westbound through/left-turn lane and a separate right-turn lane, and a southbound channelized right-turn lane. Appropriate signal timings should be developed to maintain acceptable levels of service and queue lengths; and

- **Ainslie Street and Park Hill Road:** Installation of an eastbound dual left-turn configuration and separate westbound left-turn lane. Appropriate signal timings should be developed to maintain acceptable levels of service and queue lengths.

4.1 2031 Horizon

4.1.1 Background Traffic Operations

Based on the estimated 2031 background traffic volumes, Level of Service analyses have been conducted using Synchro 10, for the weekday AM and PM peak hour conditions for the intersections in the study area. Signalized intersections were optimized for movement splits, no other improvements were considered.

Figure 4.2 and **Figure 4.3** displays the 2031 background traffic volumes for the weekday AM and PM peak hours, respectively.

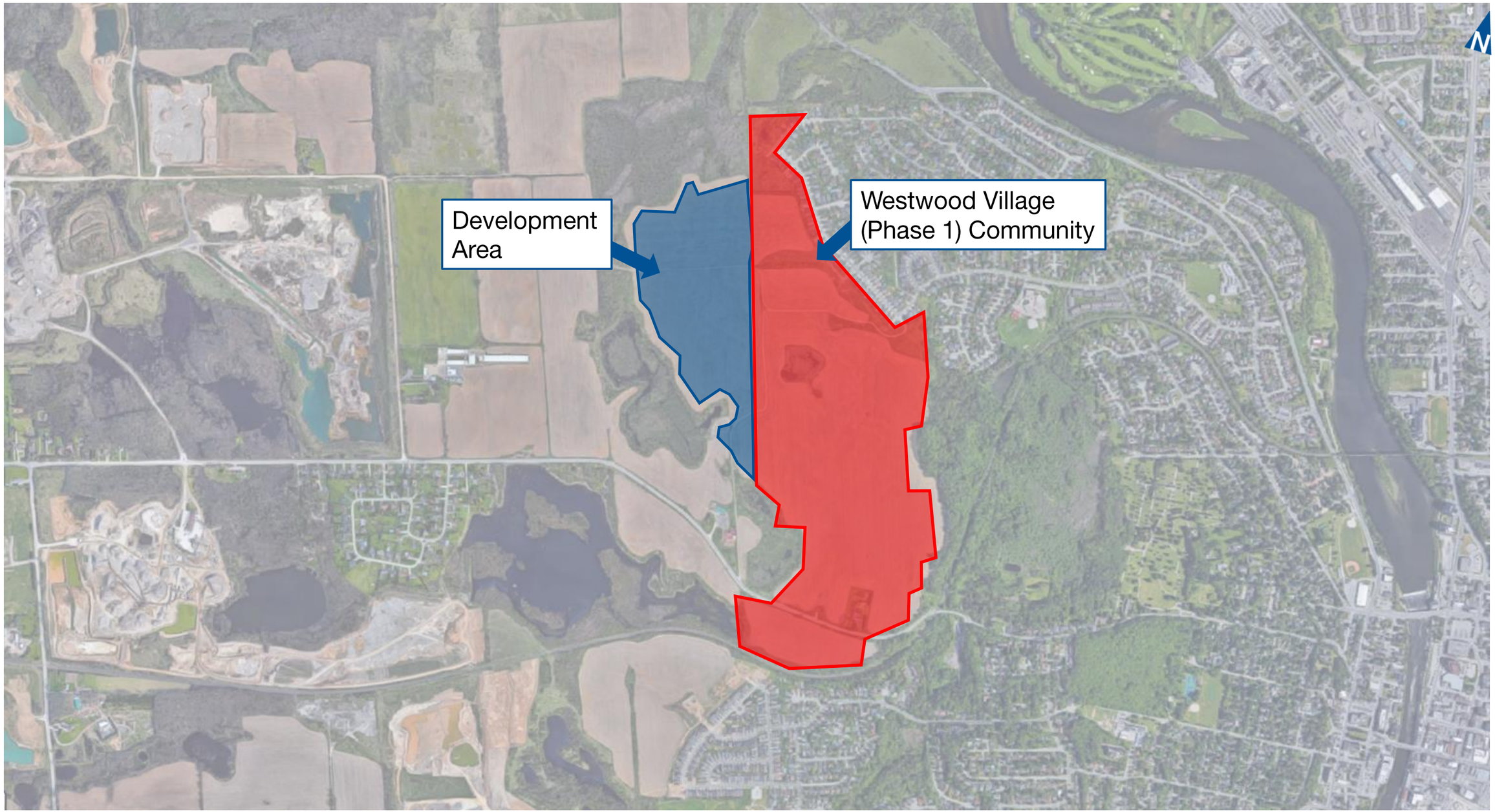
Figure 4.4 and **Figure 4.5** summarizes the results of the analysis indicating the levels of service (LOS) experienced at the study area intersections.

Most observed intersections have acceptable operational values except for the following intersections and critical movements:

- **Blair Road and George Street North (North Intersection):** The northbound shared movement is forecast to operate at a LOS F with a v/c greater than 1.0 during both peak hours. Overall, the intersection is forecast to operate at a LOS F during the PM peak hour;
- **Water Street and Park Hill Road:** The northbound left-turn movement is forecast to operate at a LOS E during the PM peak hour;
- **Roseville Road and Edworthy Side Road:** The northbound shared movement is forecast to operate at a LOS F and a LOS E during the AM and PM peak hour, respectively;
- **Blenheim Road and Parkwood Drive:** The northbound shared movement is forecast to operate at a LOS F during both peak hours, and with a v/c greater than 1.0 during the PM peak hour. Overall, the intersection is forecast to operate at a LOS F during the PM peak hour;
- **Blenheim Road and Blair Road:** The southbound shared movement is forecast to operate at a LOS F during the PM peak hour; and

- **Blair Road and George Street North (South Intersection):** The eastbound shared movement is forecast to operate at a LOS F during both peak hours, and with a v/c greater than 1.0 during the PM peak hour. The westbound shared movement is forecast to operate at a LOS F with a v/c greater than 1.0 during the PM peak hour. The southbound shared movement is forecast to operate at a LOS F with a v/c greater than 1.0 during the PM peak hour. Overall, the intersection is forecast to operate at a LOS E and LOS F during the AM and PM peak hour, respectively.

Appendix C includes the detailed Synchro 10 reports.



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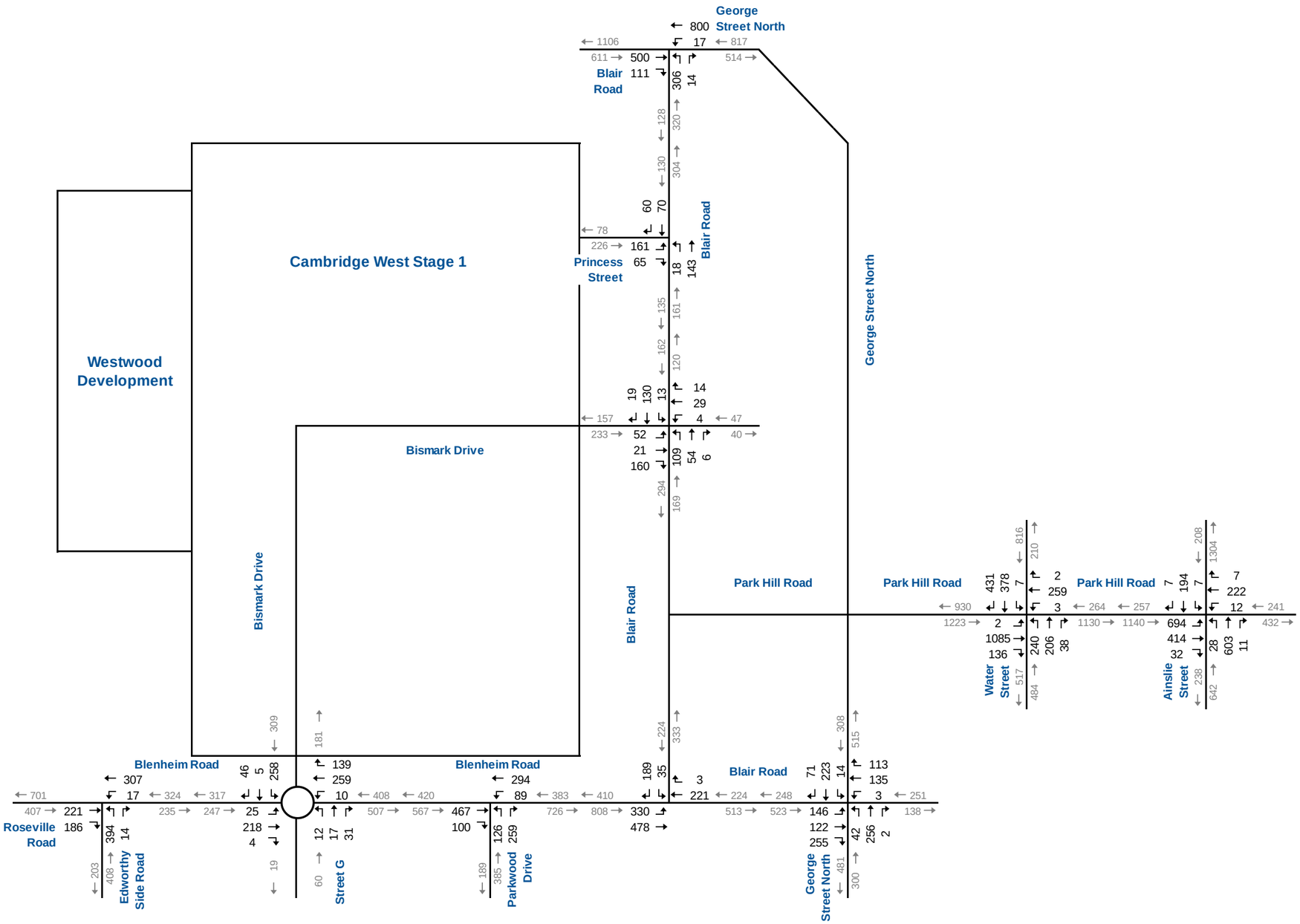
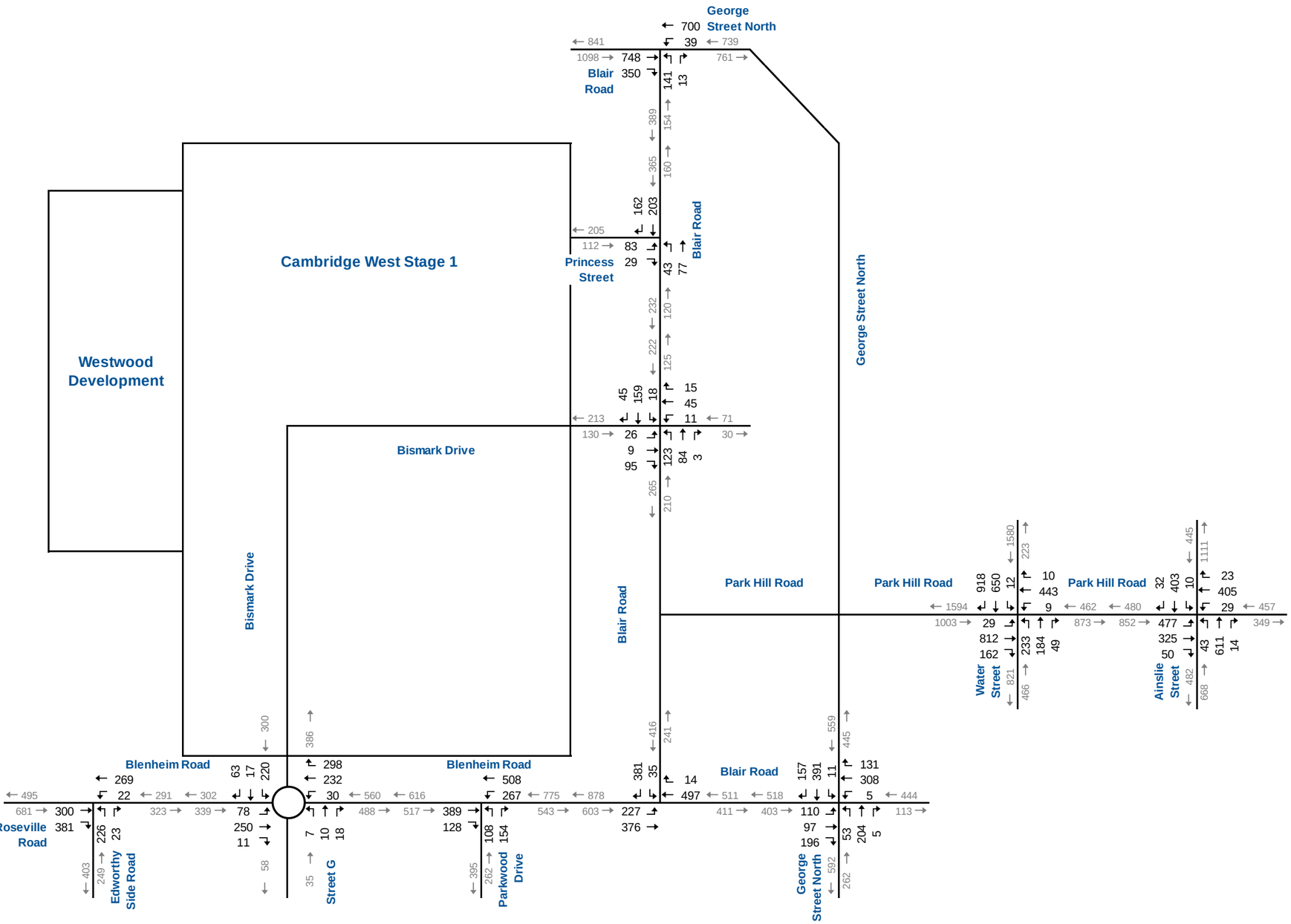
Westwood Village (Phase 1) Community Area

Figure 4.1



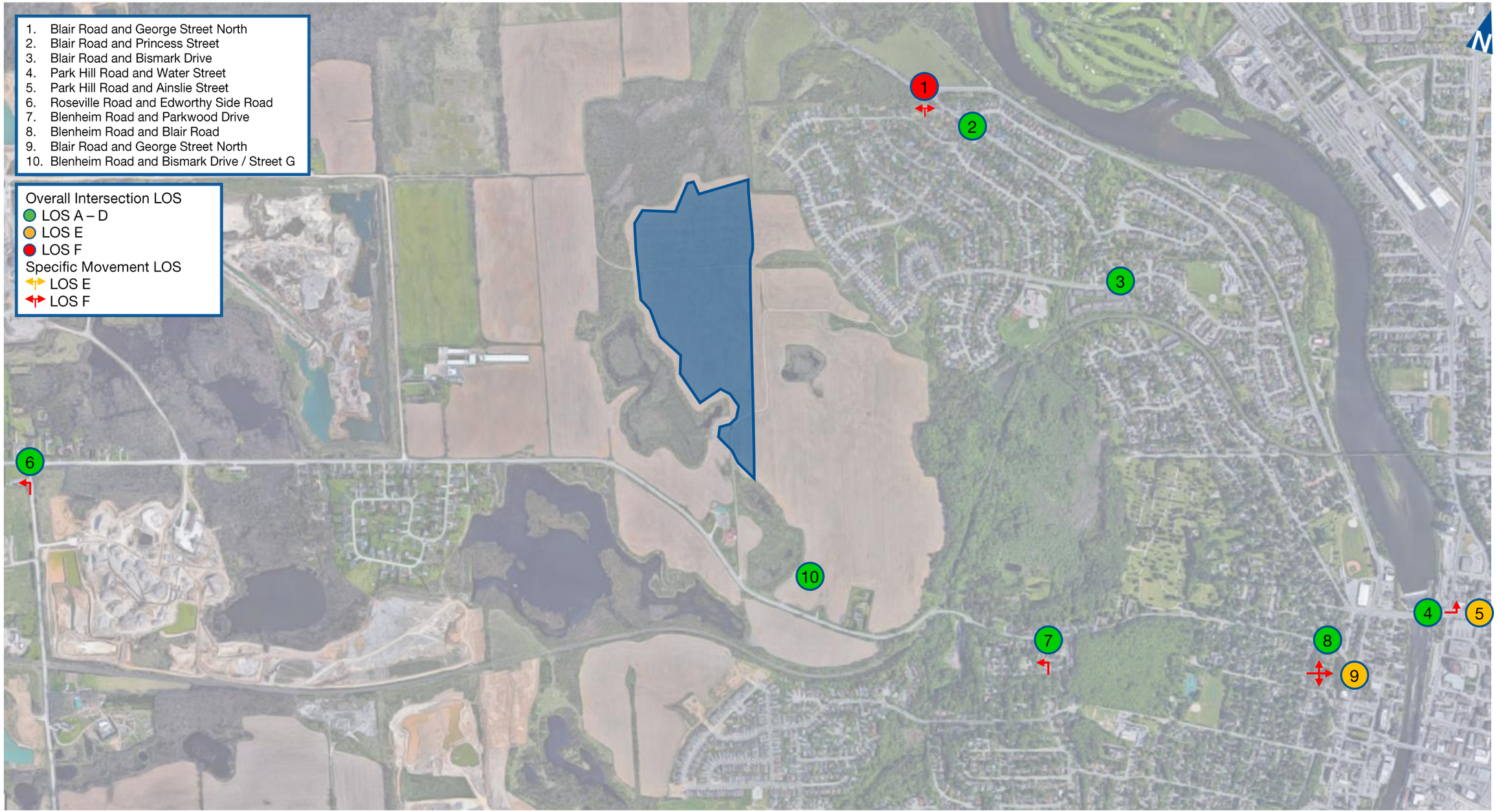
2031 Background Traffic Volumes – AM Peak

Figure 4.2



2031 Background Traffic Volumes – PM Peak

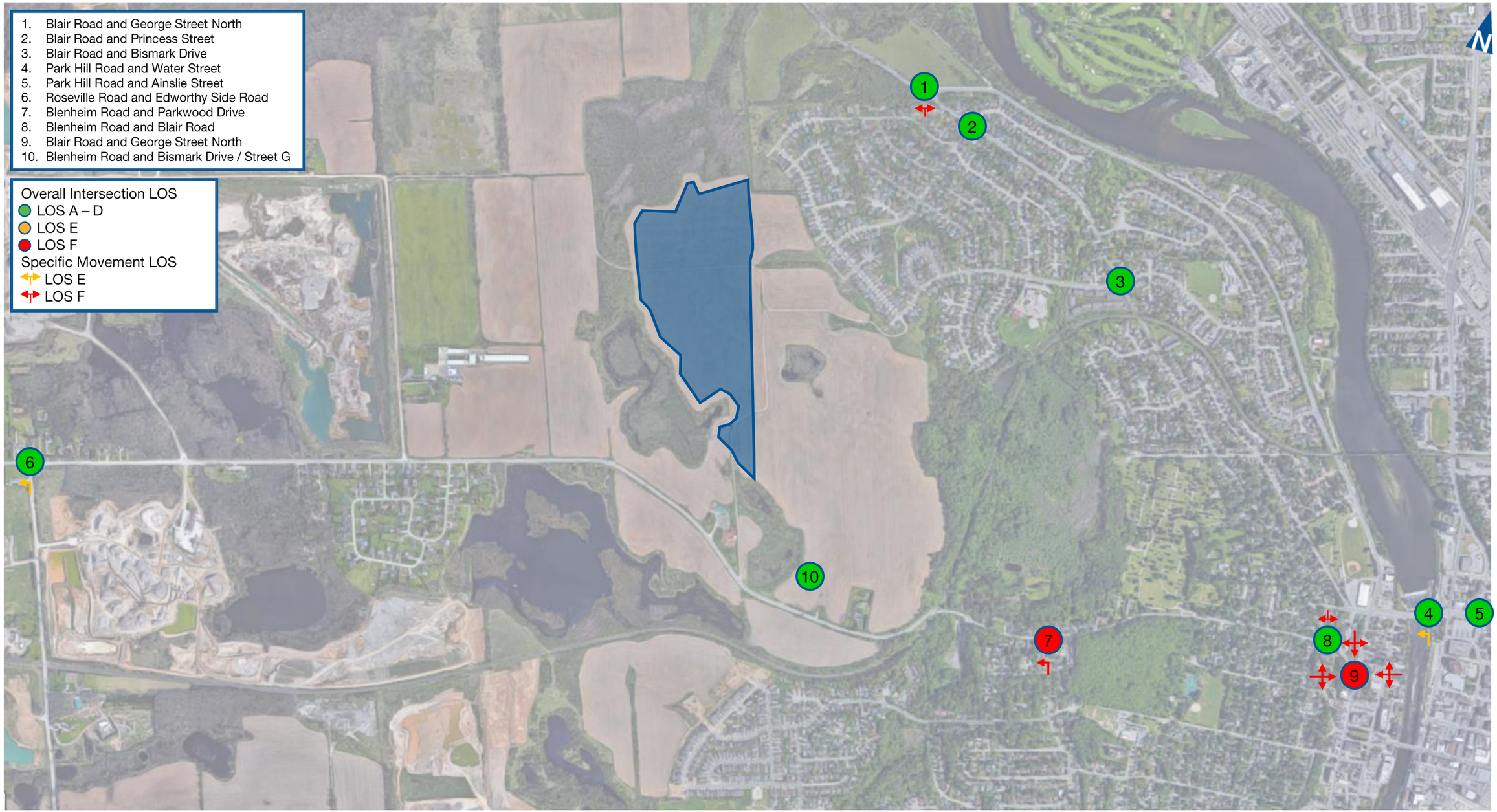
Figure 4.3



2031 Background Traffic Operations – AM Peak

Figure 4.4

Westwood Village Phase 2
180312



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2031 Background Traffic Operations – PM Peak

Westwood Village Phase 2
180312

Figure 4.5

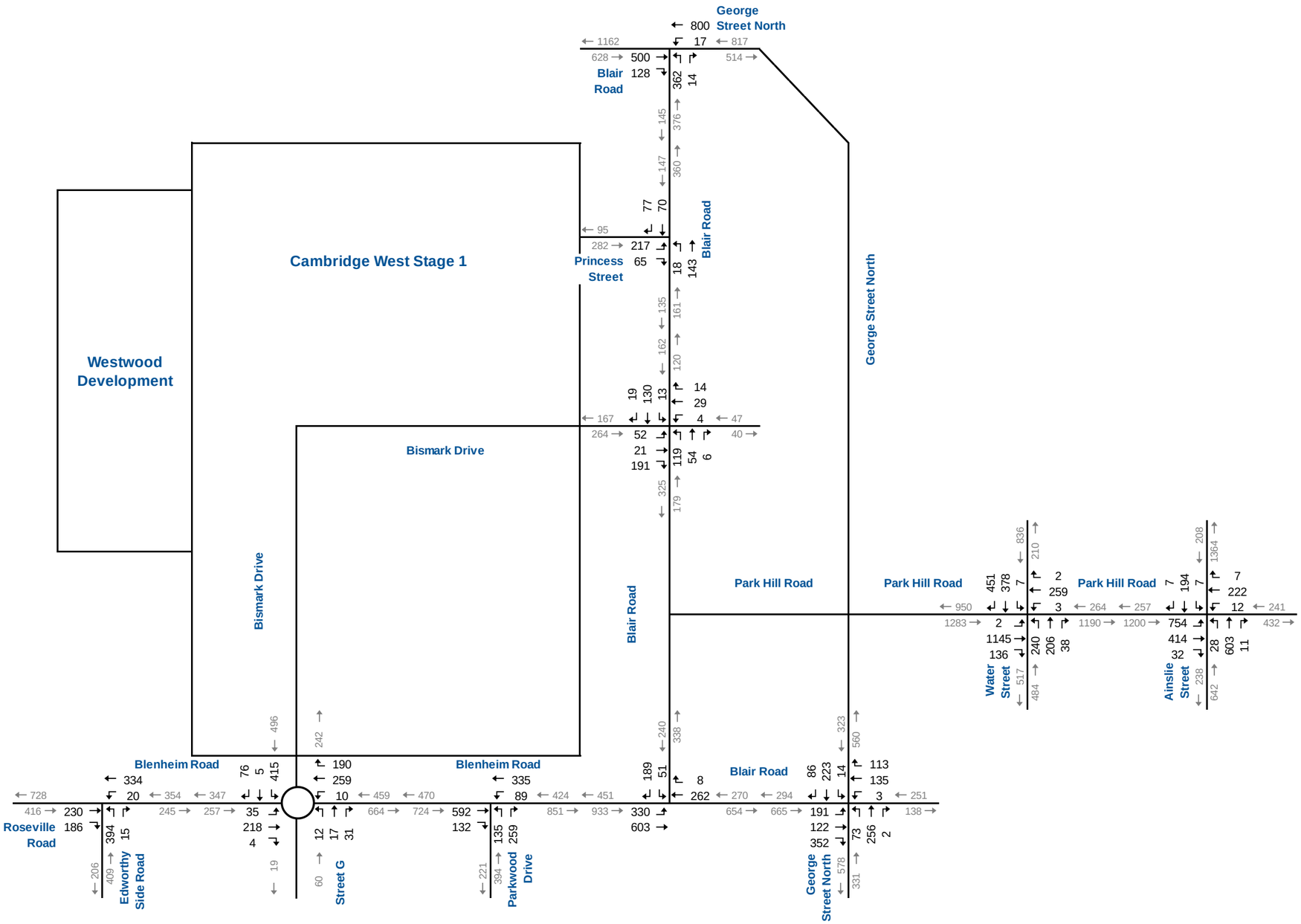
4.1.2 Total Traffic Operations

Figure 4.6 and **Figure 4.7** display the forecast 2031 total traffic volumes, including both background traffic and development traffic, for the AM and PM peaks, respectively.

Similar to background traffic conditions, Level of Service analysis was undertaken, and the results are summarized in **Figure 4.8** and **Figure 4.9**. As under background traffic conditions, most observed intersections have acceptable operational values except for the following intersections and critical movements:

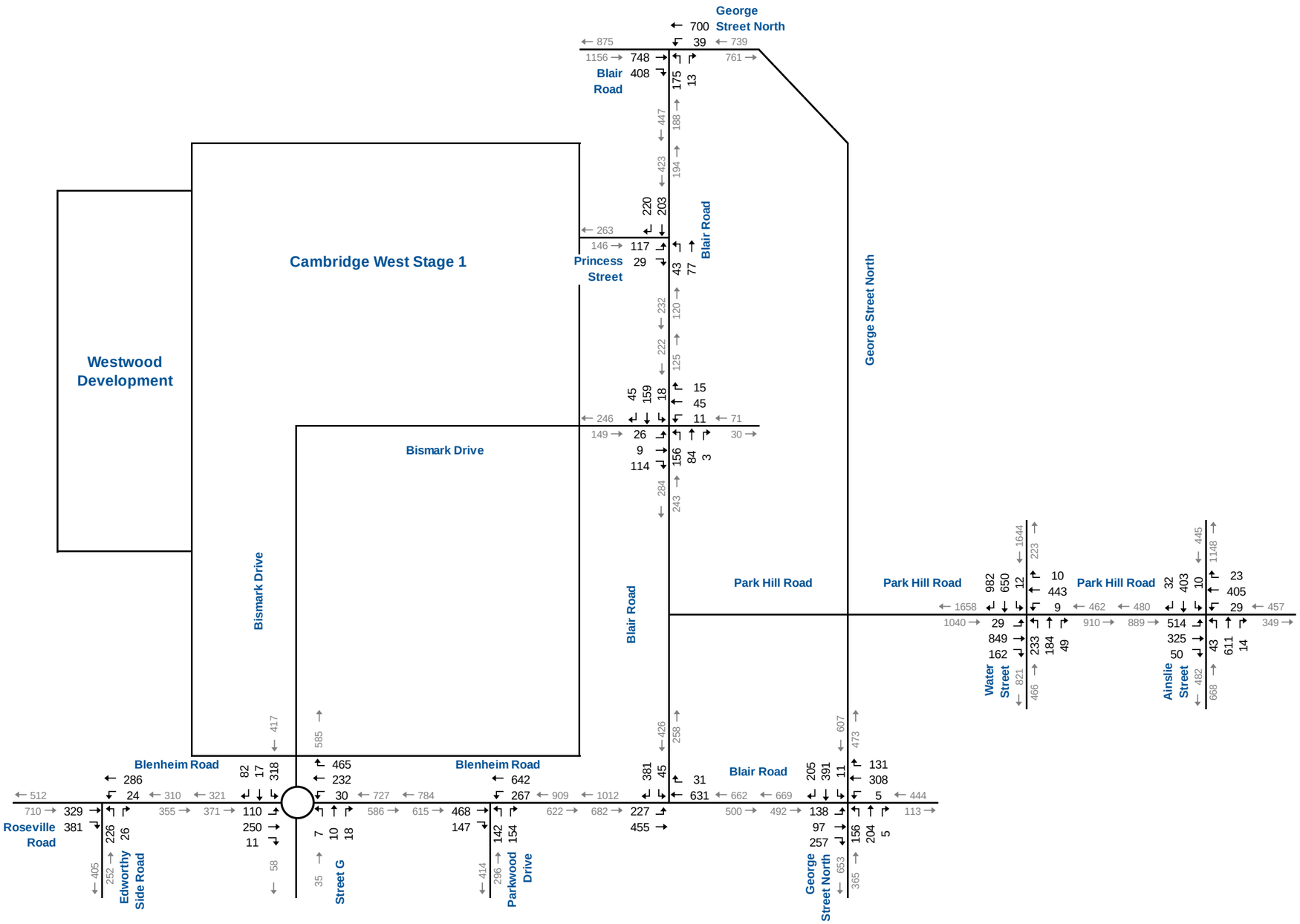
- **Blair Road and George Street North (North Intersection):** The northbound shared movement is forecast to operate at a LOS F with a v/c greater than 1.0 during both peak hours. Overall, the intersection is forecast to operate at a LOS F during the PM peak hour;
- **Water Street and Park Hill Road:** The northbound left-turn movement is forecast to operate at a LOS E during the PM peak hour;
- **Roseville Road and Edworthy Side Road:** The northbound shared movement is forecast to operate at a LOS F and a LOS E during the AM and PM peak hour, respectively;
- **Blenheim Road and Parkwood Drive:** The northbound shared movement is forecast to operate at a LOS F with a v/c greater than 1.0 during both peak hours. Overall, the intersection is forecast to operate at a LOS E and LOS F during the AM and PM peak hour, respectively;
- **Blenheim Road and Blair Road:** The southbound shared movement is forecast to operate at a LOS F during both peak hours and with a v/c greater 1.0 during the PM peak hour; and
- **Blair Road and George Street North (South Intersection):** The eastbound shared movement is forecast to operate at a LOS F with a v/c greater than 1.0 during both peak hours. The westbound, northbound and southbound shared movements are forecast to operate at a LOS F with a v/c greater than 1.0 during the PM peak hour. Overall, the intersection is forecast to operate at a LOS F during both peak hours.

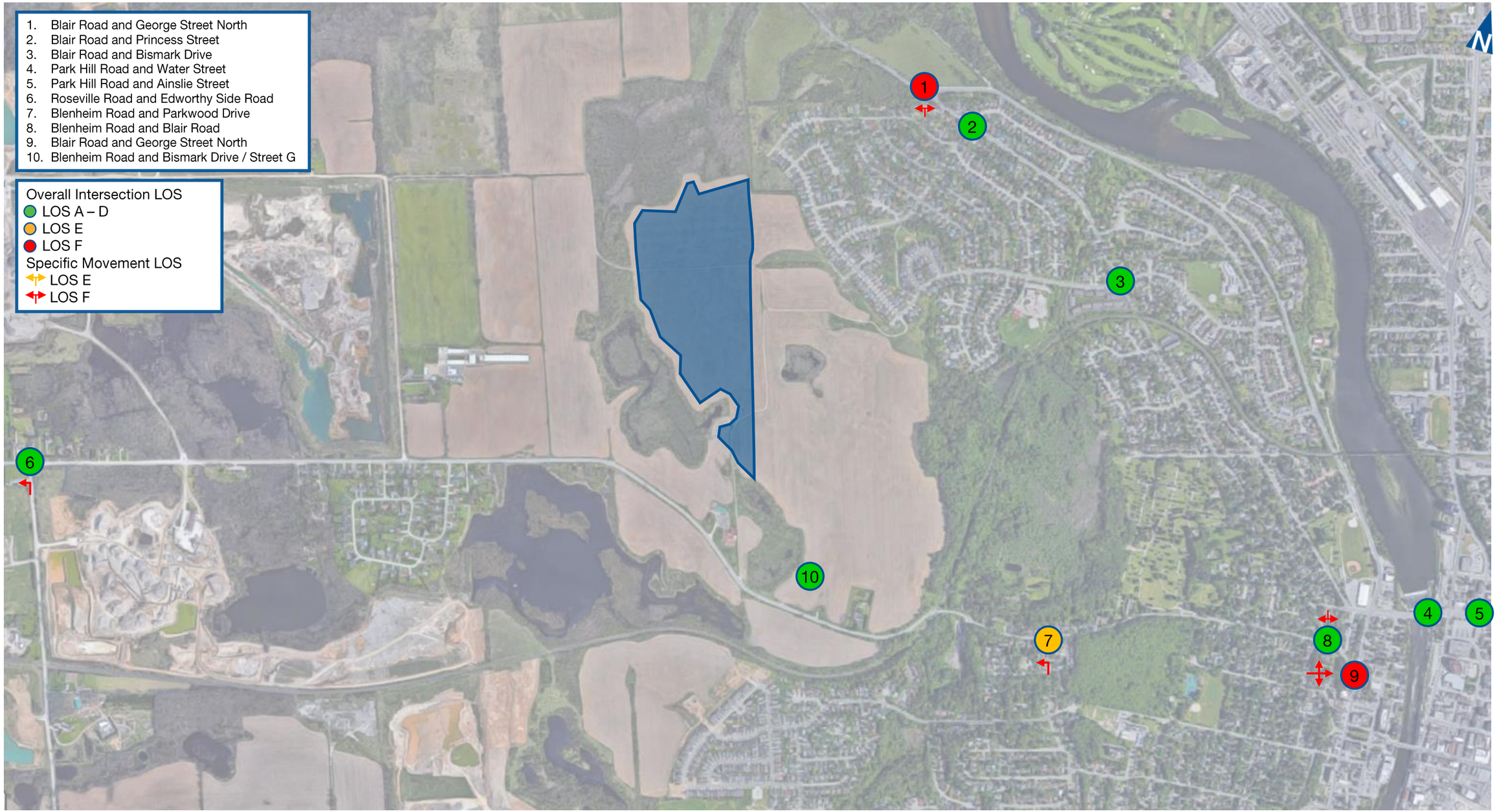
Appendix D includes the detailed Synchro 10 reports.



2031 Total Traffic Volumes – AM Peak

Figure 4.6


George Street North
Cambridge West Stage 1
Westwood Development
Bismark Drive
Blair Road
Princess Street
Blair Road
George Street North
Bismark Drive
Park Hill Road
Park Hill Road
Park Hill Road
Water Street
Ainslie Street
Blenheim Road
Blenheim Road
Blair Road
Roseville Road
Edworthy Side Road
Street G
Parkwood Drive
George Street North



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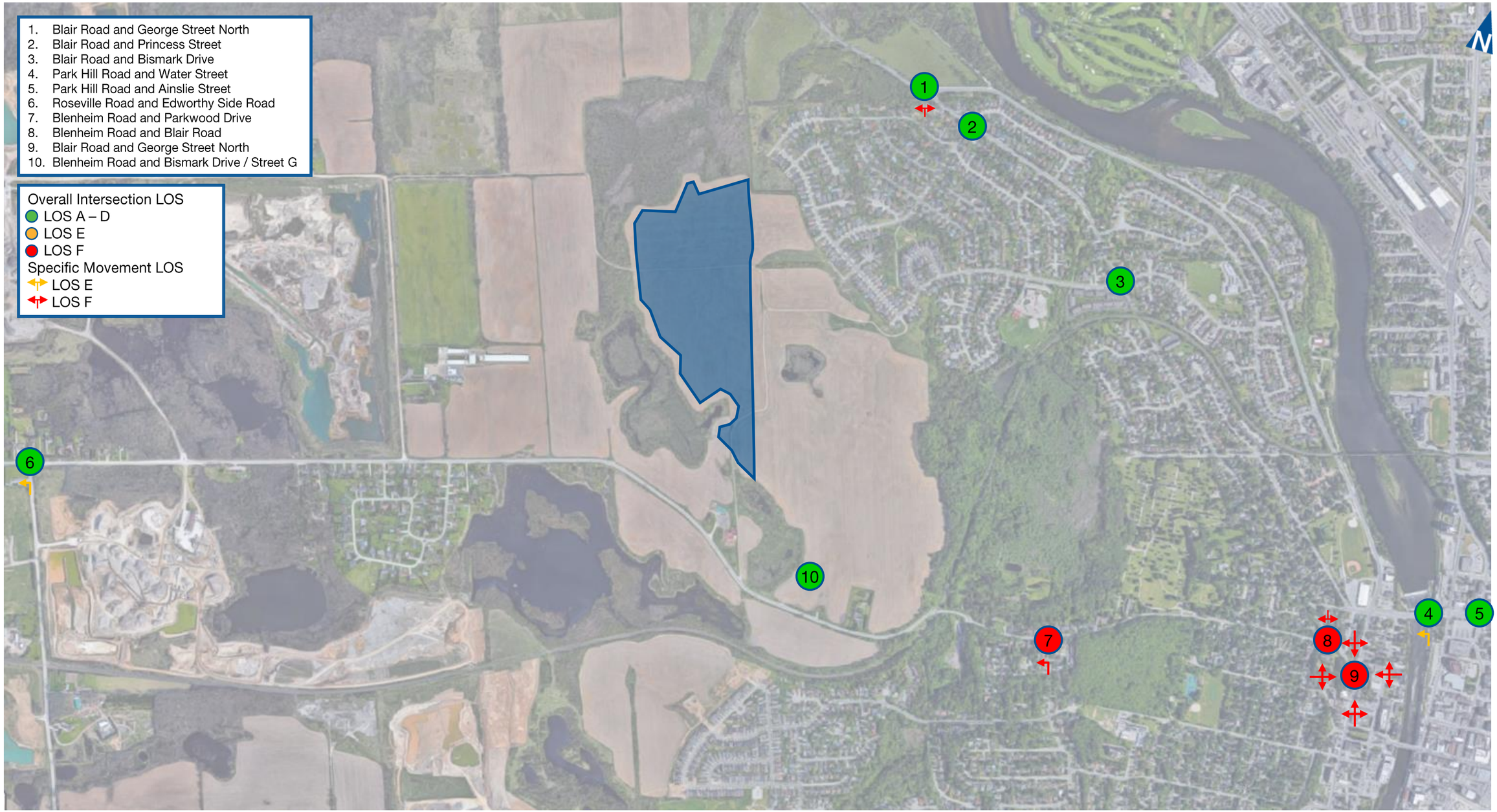
2031 Total Traffic Operations – AM Peak

Westwood Village Phase 2
180312

Figure 4.8



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2031 Total Traffic Operations – PM Peak

Westwood Village Phase 2
180312

Figure 4.9

4.1.3 Phase 1 and Phase 2 Traffic Operations Comparison

As noted above, this TIS follows the assumptions made in the Phase 1 TIS, so a comparison of the traffic operations was completed to determine the increase is operational deficiencies. It was found that the following intersections experienced a decrease in operations:

- **Blenheim Road and Blair Road:** The southbound shared left-right movement is forecast to decrease from a LOS D to F during the AM peak hour. The overall intersection operation is forecast to decrease from a LOS C to F during the PM peak hour; and
- **George Street North and Blair Road/Blair Road:** The northbound shared movement is forecast to decrease from a LOS D to F during the PM peak hour.

Table 4.1 summarizes the comparison between the traffic operations under the 2031 background (Phase 1) and total (Phase 2) horizons.

TABLE 4.1: PHASE 1 AND 2 TRAFFIC OPERATIONS COMPARISON

Analysis Period	Intersection	Control Type	Movement	Scenario Level of Service	
				Background - Including Westwood Village (Phase 1) Community	Total - Westwood Village (Phase 2) Community
AM Peak Hour	1: Blair Road and Geroge Street North	TWSC	NBL/NBR	F	F
	6: Edworthy Side Road and Roseville Road/Blenheim Road	TWSC	NBL/NBR	F	F
	7: Parkwood Drive and Blenheim Road	TWSC	NBL/NBR	F	F
	8: Blenheim Road and Blair Road	TWSC	SBL/SBR	D	F
	9: George Street North and Blair Road/Blair Road	TWSC	EBA	F	F
PM Peak Hour	1: Blair Road and Geroge Street North	TWSC	NBL/NBR	F	F
	4: Water Street & Park Hill Road	TCS	NBL	E	E
	6: Edworthy Side Road and Roseville Road/Blenheim Road	TWSC	NBL/NBR	E	E
	7: Parkwood Drive and Blenheim Road	TWSC	NBL/NBR	F	F
	8: Blenheim Road and Blair Road	TWSC	SBL/SBR	F	F
	9: George Street North and Blair Road/Blair Road	TWSC	EBA	F	F
			WBA	F	F
			NBA	D	F
			SBA	F	F

LOS - Level of Service
TCS - Traffic Control Signal
TWSC - Two-Way Stop Control

Note: Highlighted values decrease from a LOS A - D to a LOS E or F under the 2031 total horizon.

5 Remedial Measures

5.1 Signal Justification

Signal justification warrants, using the OTM Book 12 Justification 7[5], were analyzed for the following intersections under the 2031 traffic conditions:

- **Blair Road and George Street North (North Intersection):** It was found that a signal is not justified at the intersection, Warrant 1 and 2 achieving 55.3% and 116.0% out of the 120% requirement, respectively. The Region of Waterloo plans to review the need for enhanced traffic control at this intersection in 2019 and every five years thereafter;
- **Roseville Road and Edworthy Side Road:** It was found that a signal is not justified at the intersection, Warrant 1 and 2 achieving 91.8% and 93.2% out of the 120% requirement, respectively;
- **Blenheim Road and Parkwood Drive:** It was found that a signal is not justified at the intersection, Warrant 1 and 2 achieving 67.6% and 92.3% out of the 120% requirement, respectively;
- **Blenheim Road and Blair Road:** It was found that a signal is not justified at the intersection, Warrant 1 and 2 achieving 65.3% and 32.0% out of the 120% requirement, respectively;
- **Blair Road and George Street North (South Intersection):** It was found that a signal is not justified at the intersection, Warrant 1 and 2 achieving 120.8% and 56.5% out of the 120% requirement, respectively.

  By 2031, the warrant calculations are forecast to reach the threshold to justify a signal. However, as the warrant is just barely met, and the assumed background growth, trip generation and assignment could potentially change by the 2031 horizon, it is not recommended that a signal be implemented currently. Rather, this intersection should be monitored and reviewed regularly by the Region of Waterloo.

Appendix E contains the OTM Book 12 Signal Justification Warrant worksheets.

[5] Book 12: Traffic Signals, *Ministry of Transportation of Ontario*, March 2012

5.2 Left-Turn Lanes

The need for designated left-turning lanes at unsignalized intersections within the study area was assessed using the procedures detailed the MTO Supplement to the Geometric Design Guide for Canadian Roads[6]. Standard practice in the Region of Waterloo considers a design speed of 10 km/h higher than the posted limited, considering the urban characteristics of the immediate area and the restricted flow of traffic.

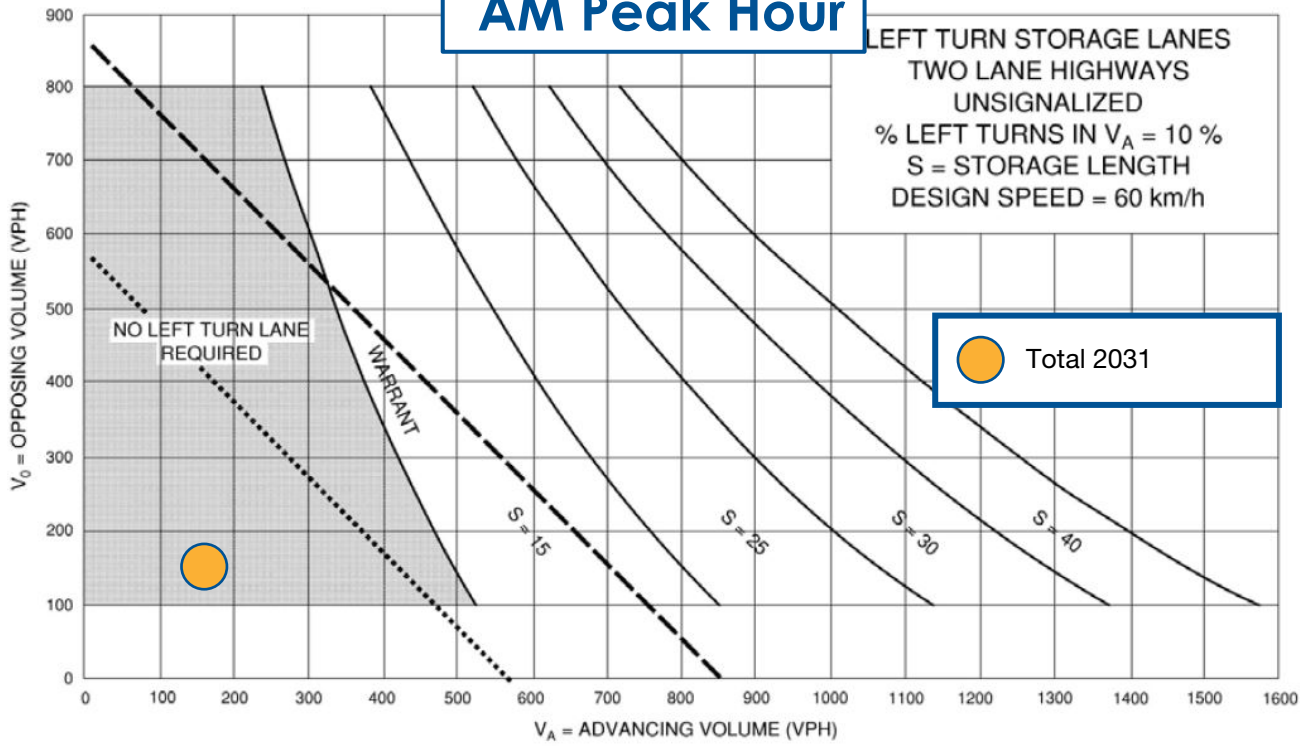
Left-turn lane warrants were assessed for the following intersections under the 2031 total and background traffic conditions:

- **Blair Road and Princess Street:** a northbound left-turn lane is not forecast to be warranted;
- **Blair Road and Bismark Drive:** a northbound left-turn lane is not forecast to be warranted;
- **Roseville Road and Edworthy Side Road:** a westbound left-turn lane with 15 metres of storage length is forecast to be warranted under both the 2031 background and 2031 total conditions, regardless of whether the subject development is built;
- **Blenheim Road and Parkwood Drive:** a westbound left-turn lane with 65 of storage length is forecast to be warranted under the 2031 background conditions, regardless of whether the subject development is built. An additional 10 metres of storage length is forecast to be warranted under 2031 total conditions; and
- **Blenheim Road and Blair Road:** an eastbound left-turn lane with 50 of storage length is forecast to be warranted under the 2031 background conditions, regardless of whether the subject development is built. An additional 15 metres of storage length is forecast to be warranted under the 2031 total condition.

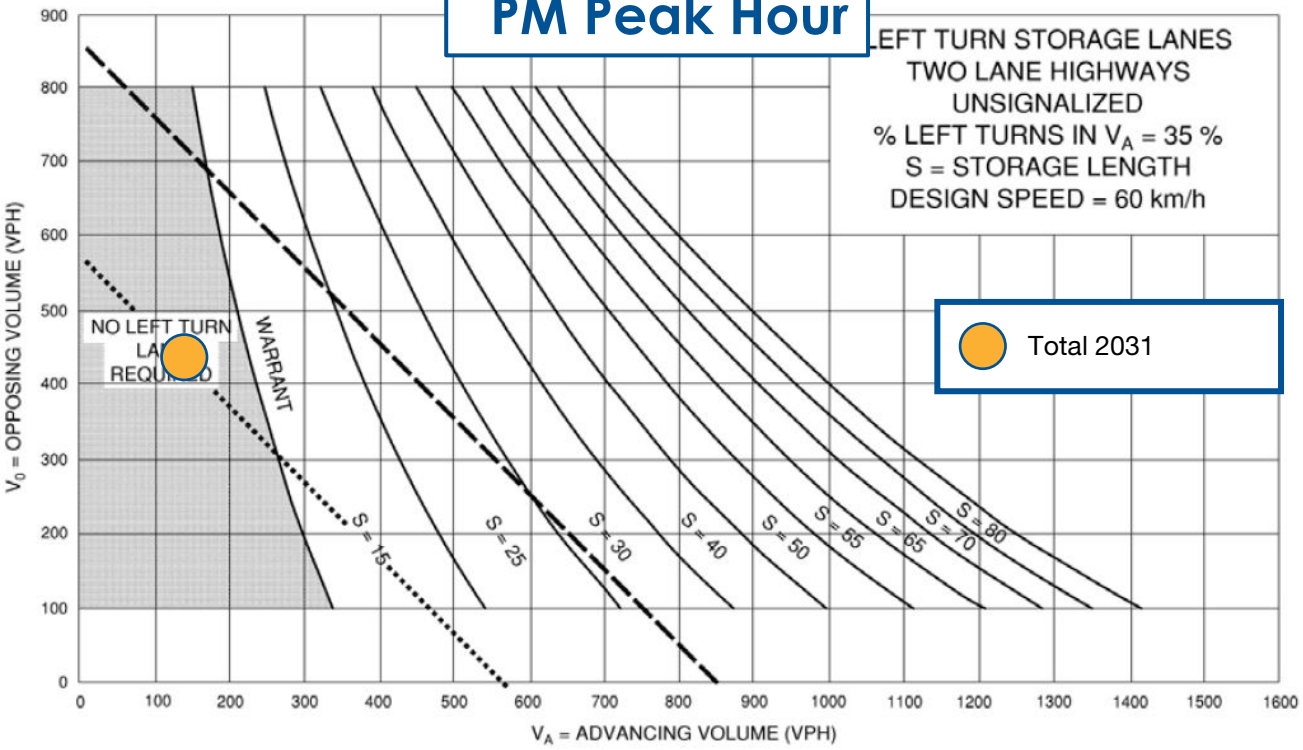
Figure 5.1 – Figure 5.7 displays the left-turn lane warrant nomographs for the intersections.

[6] Geometric Design Guide for Canadian Road, *Transportation Association of Canada,* 2016.

AM Peak Hour



PM Peak Hour



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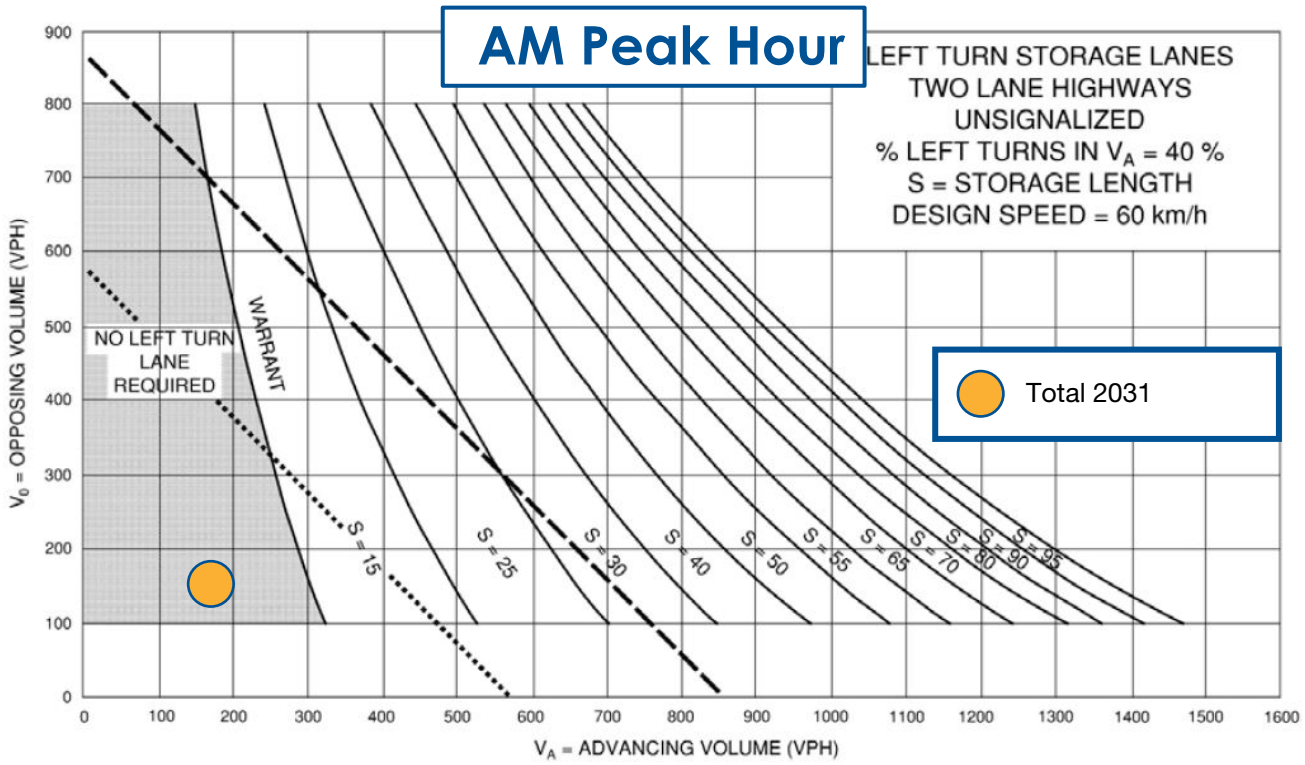
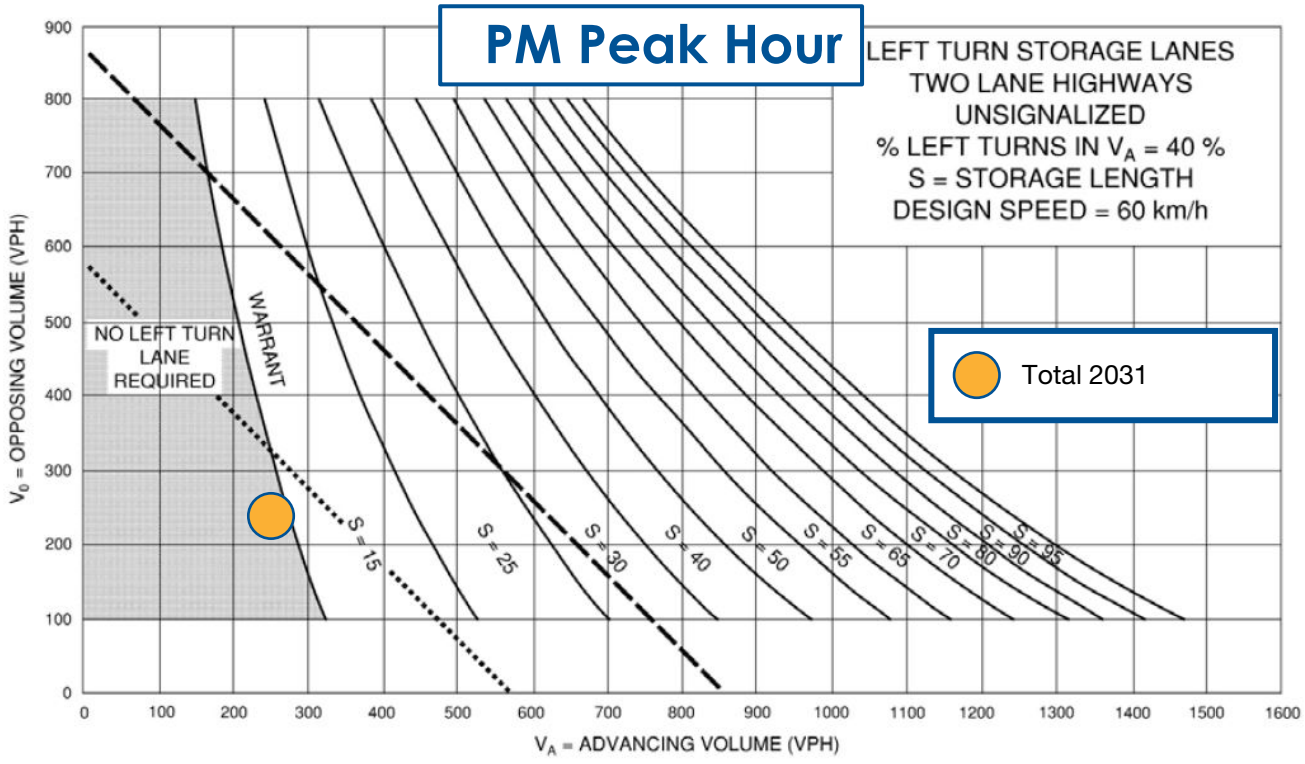
Northbound Left-Turn Lane Warrants, Blair Road and Princess Street





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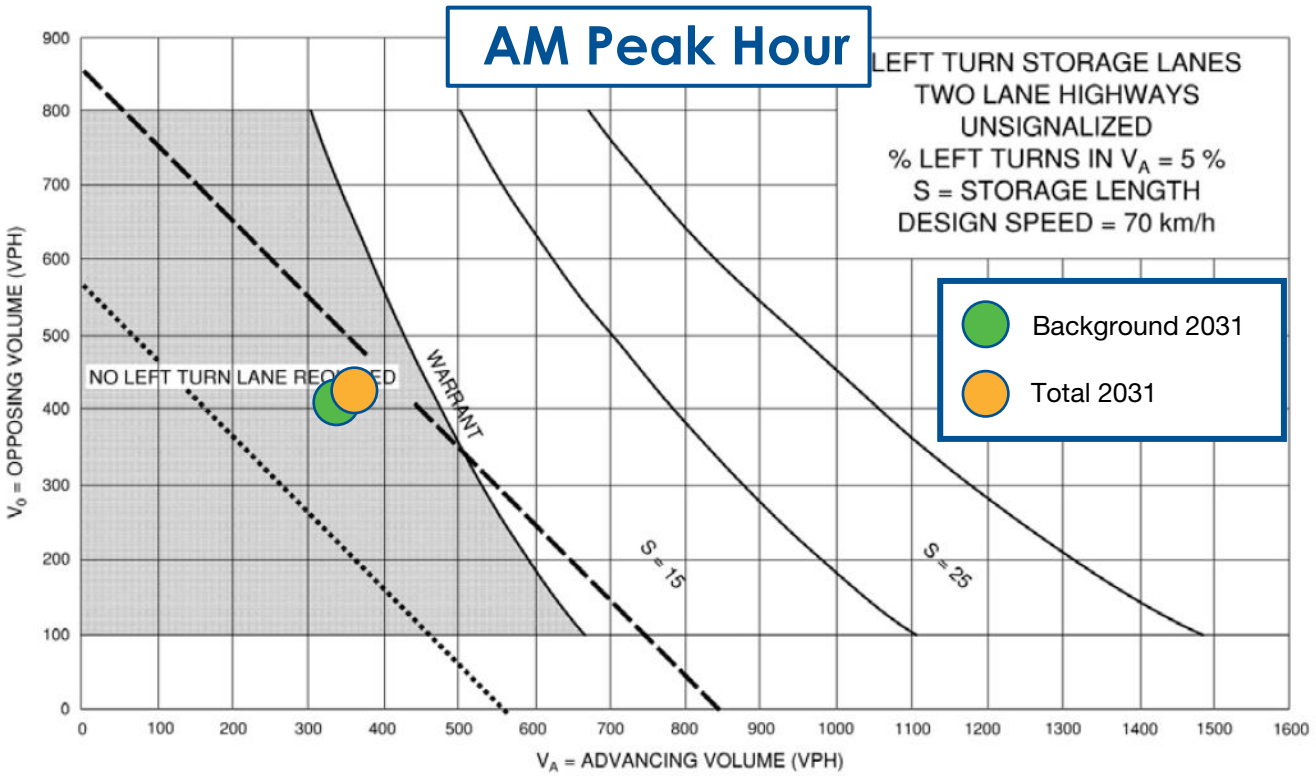
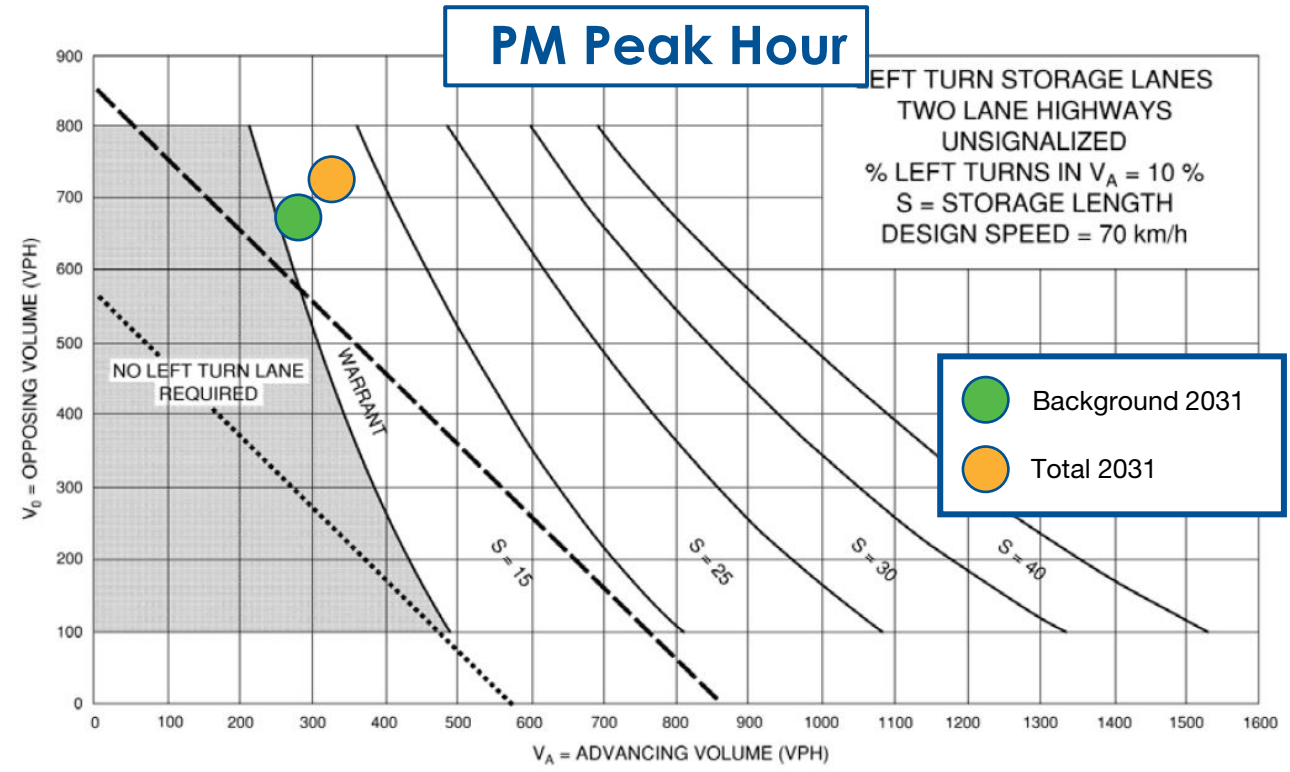
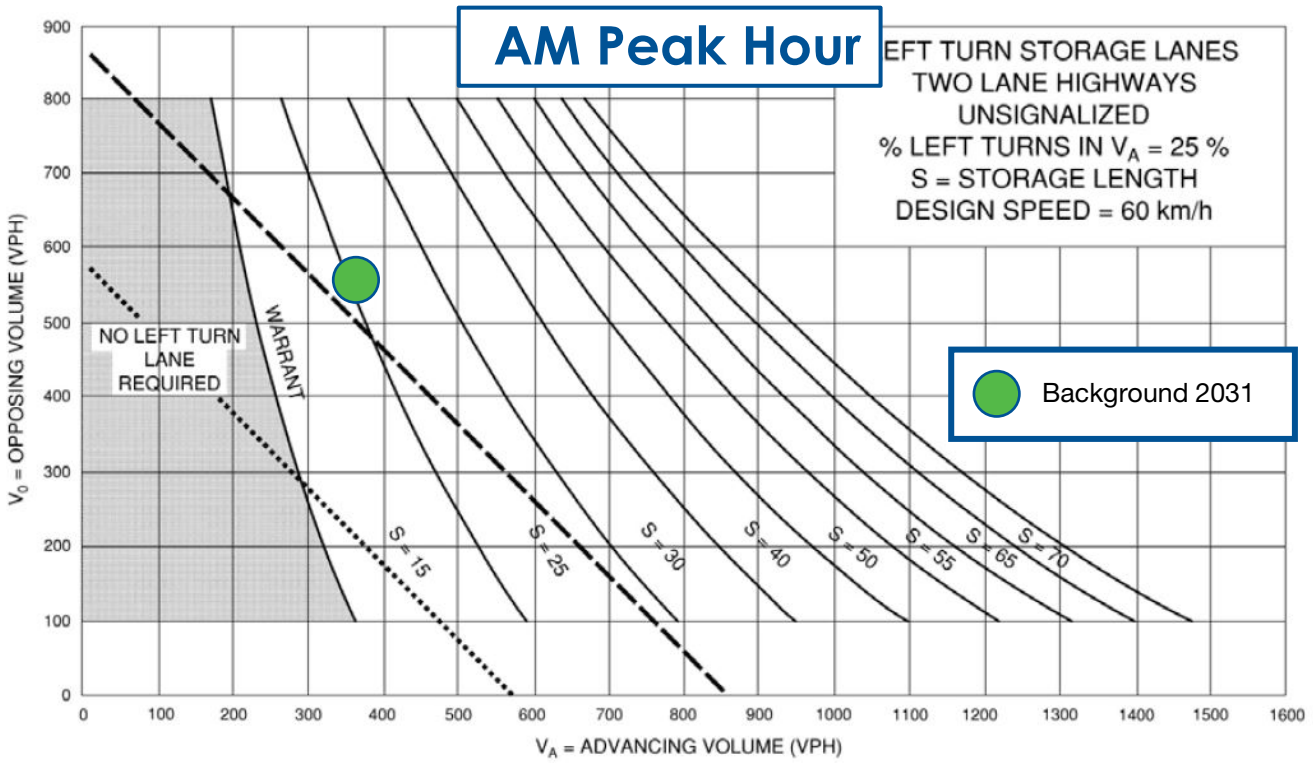
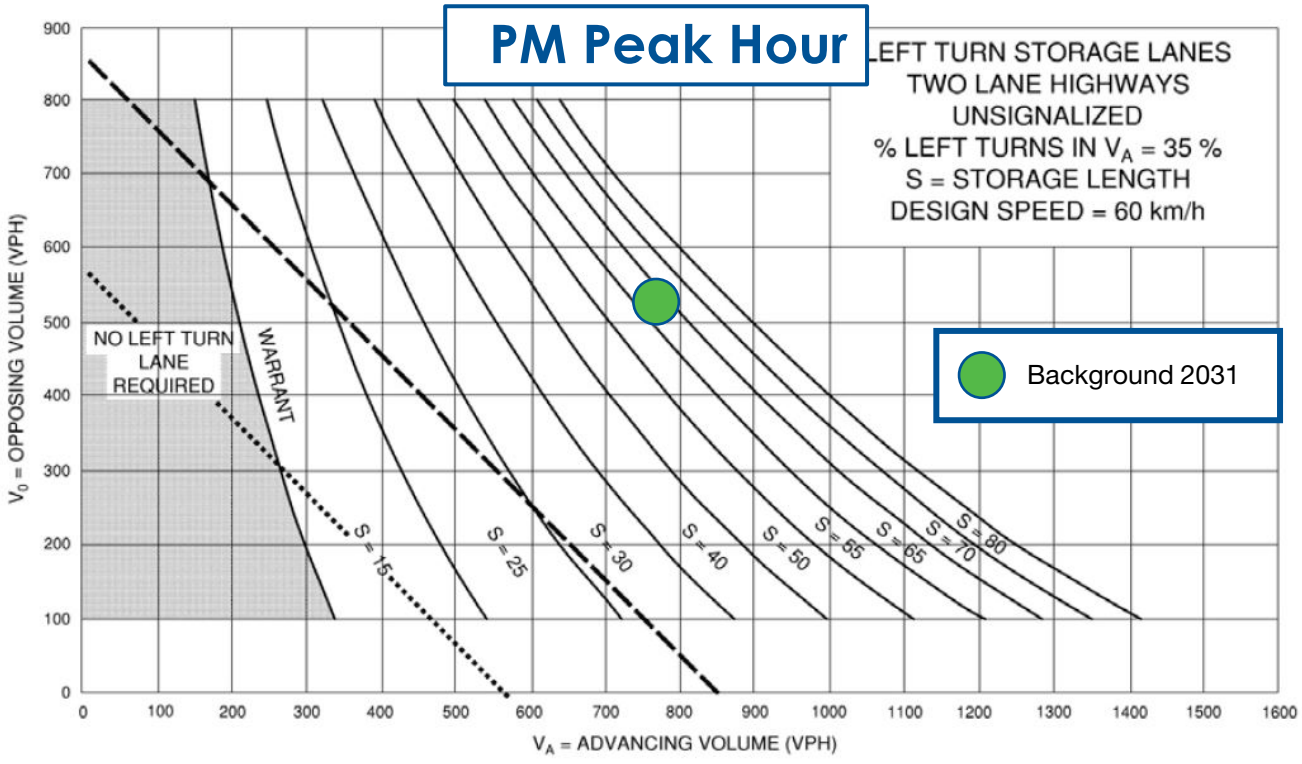
Northbound Left-Turn Lane Warrants, Blair Road and Bismark Drive





Westbound Left-Turn Lane Warrants, Roseville Road and Edworthy Side Road





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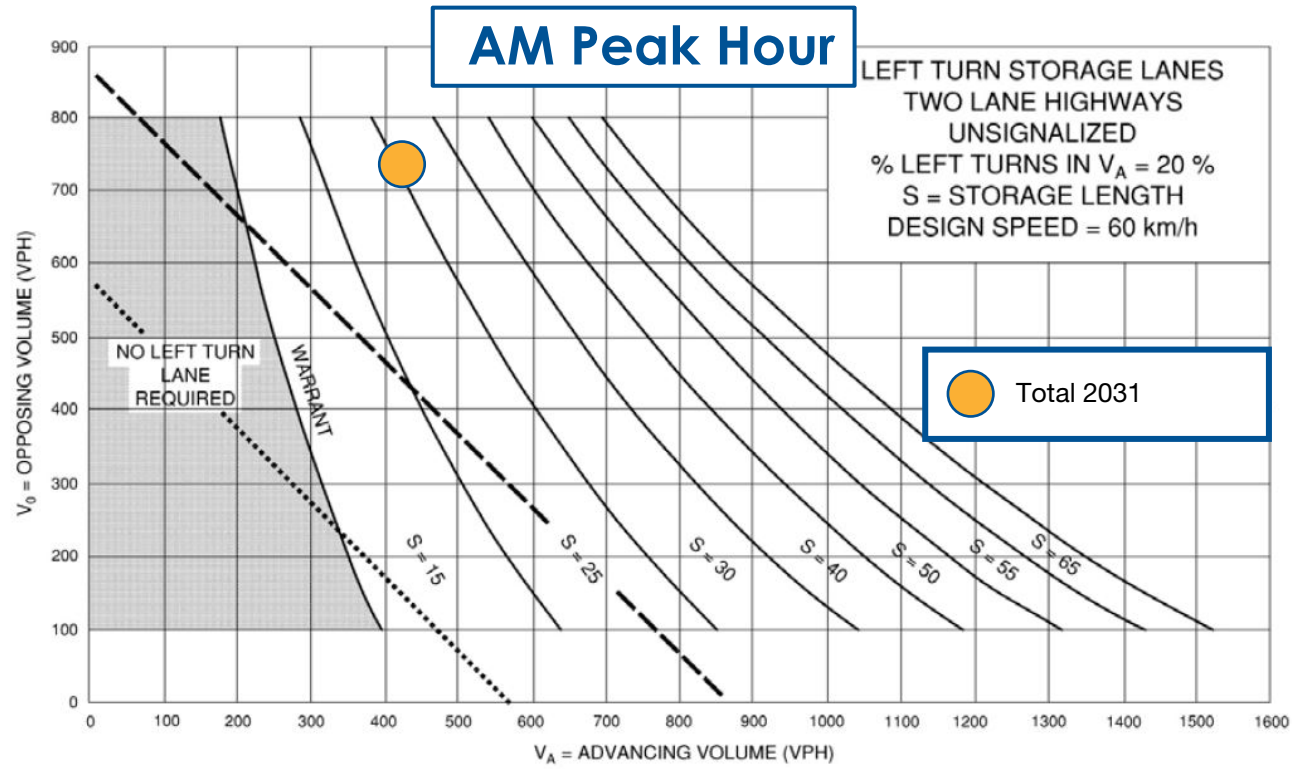
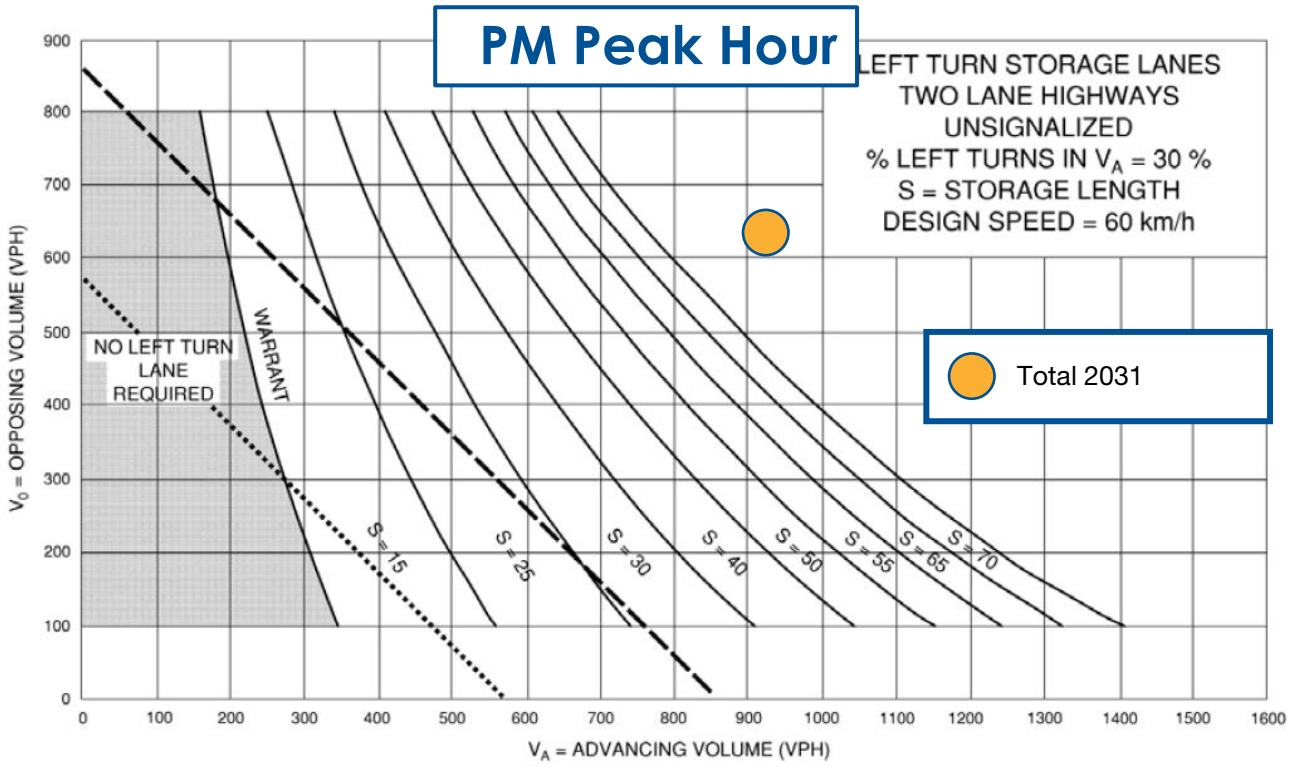
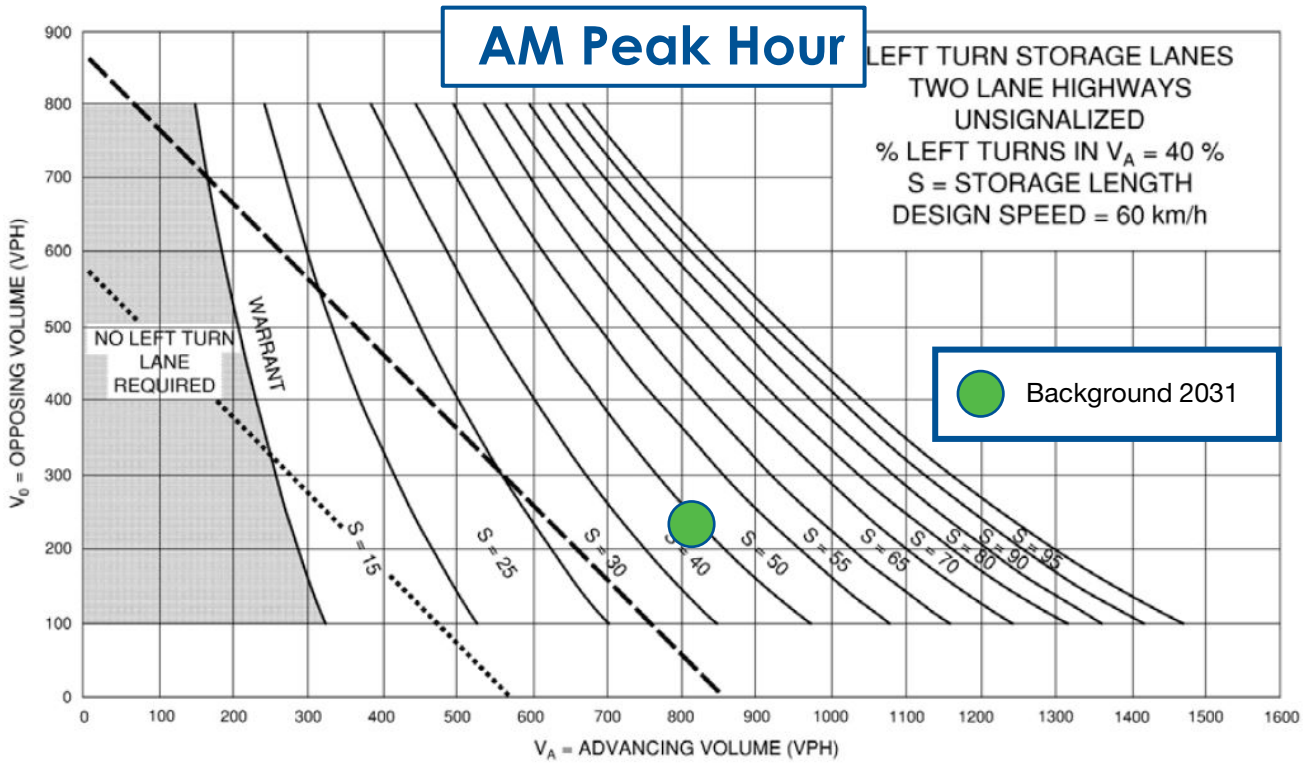
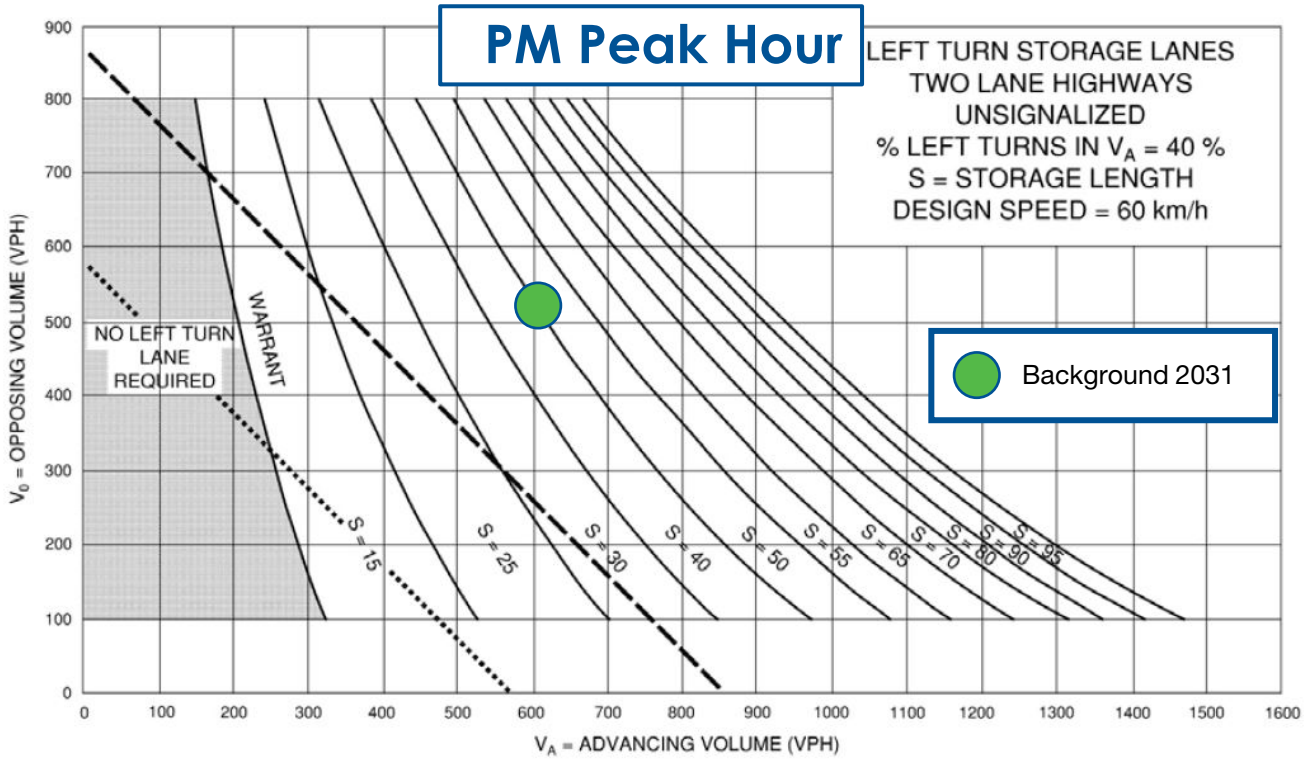
Northbound Left-Turn Lane Warrants, Blenheim Road and Parkwood Drive – Background 2031





Northbound Left-Turn Lane Warrants, Blenheim Road and Parkwood Drive – Total 2031





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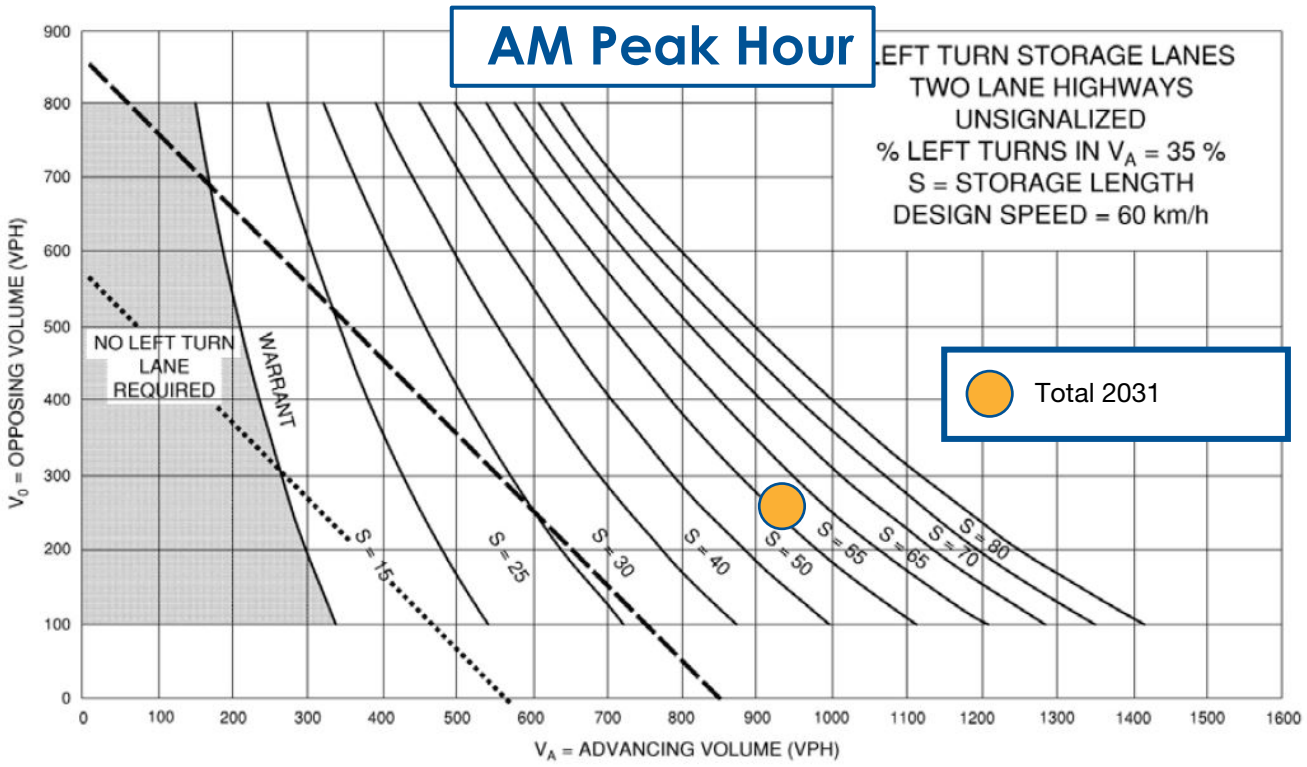
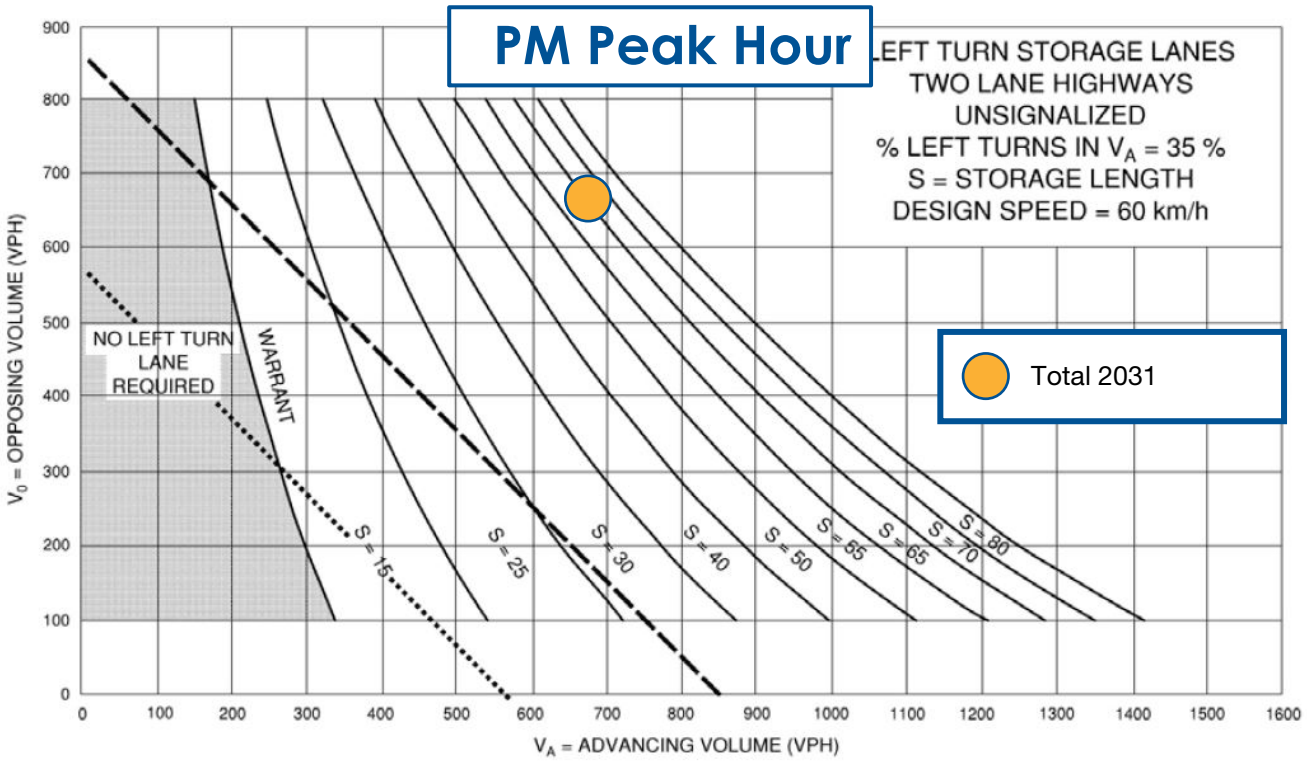
Northbound Left-Turn Lane Warrants, Blenheim Road and Blair Road – Background 2031





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Northbound Left-Turn Lane Warrants, Blenheim Road and Blair Road – Total 2031

5.3 Additional Intersection Improvements

Due to the increase in traffic caused by both the background growth and the proposed development, the following intersections are forecast to have movements with poor operations under the 2031 background and total traffic conditions:

- Blair Road and George Street North (North Intersection);
- Roseville Road and Edworthy Side Road;
- Blenheim Road and Parkwood Drive;
- Blenheim Road and Blair Road.

To remedy this, additional turn lanes or signal timing improvements may be added to provide additional capacity, discussed in more detail below.

5.3.1 Blair Road and George Street North (North Intersection)

Although a traffic signal is not warranted, it is recommended that the Region review traffic control requirements at this intersection at appropriate intervals.

5.3.2 Roseville Road and Edworthy Side Road

Although a traffic signal is not warranted, it is recommended that the Region review traffic control requirements at this intersection at appropriate intervals.

5.3.3 Blenheim Road and Parkwood Drive

Although a traffic signal is not warranted, it is recommended that the Region review traffic control requirements at this intersection at appropriate intervals.

5.3.4 Blenheim Road and Blair Road

Although a traffic signal is not warranted, it is recommended that the Region review traffic control requirements at this intersection at appropriate intervals.

6 Conclusions and Recommendations

6.1 Conclusions

- Westwood Village Phase 2 is forecast to generate 361 and 462 trips during the AM and PM peak hour, respectively;
- **Table 6.1** summarizes the movements where levels of service and/or capacity thresholds could be exceeded that warrant mitigation or improvements;
- Left-turn Lanes are warranted at the intersections of:
  - **Roseville Road and Edworthy Sideroad (westbound):** 15 metres of storage length is warranted by 2031 background traffic conditions, regardless of whether the subject development.
  - **Blenheim Road and Parkwood Drive (westbound):** 65 metres of storage length is warranted by 2031 background traffic conditions, regardless of whether the subject development. An additional 10 metres of storage length is warranted by the 2031 total traffic conditions.
  - **Blenheim Road and Blair Road (eastbound):** 50 metres of storage length is warranted by 2031 background traffic conditions, regardless of whether the subject development. An additional 20 metres of storage length is warranted by the 2031 total traffic conditions.

TABLE 6.1: SUMMARY OF MOVEMENTS OF INTEREST AND WARRANTED IMPROVEMENTS

Intersection	No.	Issue / Remediation Type	Scenairo	
			Background - including Westwood Village (Phase 1) Community	Total - Westwood Village (Phase 2) Community
Blair Road and George Street North (North)	1	Identified Movement of Interest[1]	NBLT	NBLT
		Warranted Improvements	None	None
		Discussion and Recommendation	Region staff review traffic control	Region staff review traffic control
Park Hill Road and Water Street	4	Identified Movement of Interest[1]	EBLT, NBLT and SBRT	None
		Warranted Improvements	None	None
		Discussion and Recommendation	See Section 4.0.2	
Park Hill Road and Ainslie Street	5	Identified Movement of Interest[1]	EBLT	None
		Warranted Improvements	None	None
		Discussion and Recommendation	See Section 4.0.2	
Roseville Road and Edworthy Side Road	6	Identified Movement of Interest[1]	NBLT	NBLT
		Warranted Improvements	None	15 meter westbound LTL
		Discussion and Recommendation	Region staff review traffic control	Region staff review traffic control
Blenheim Road and Parkwood Drive	7	Identified Movement of Interest[1]	NBLT	NBLT
		Warranted Improvements	None	75 meter westbound LTL
		Discussion and Recommendation	Region staff review traffic control	Region staff review traffic control
Blenheim Road and Blair Road	8	Identified Movement of Interest[1]	SBLT	SBLT
		Warranted Improvements	None	65 meter eastbound LTL
		Discussion and Recommendation	Region staff review traffic control	Region staff review traffic control
Blair Road and George Street North (South)	9	Identified Movement of Interest[1]	EBA, WBA, NBA and SBA	EBA, WBA, NBA and SBA
		Warranted Improvements	None	None
		Discussion and Recommendation	Region staff review traffic control	Region staff review traffic control

1 - Movements identified as operating at LOS E or F

6.2 Recommendations

This study has identified the following improvements to the transportation network to address deficiencies caused by the development of the Westwood Village Phase 2 lands:

- **Blair Road and George Street North (North Intersection):** It is recommended that the Region of Waterloo continue to review the need for enhanced traffic control at this intersection at appropriate intervals;
- **Roseville Road and Edworthy Side Road:** It is recommended that an auxiliary westbound left-turn lane with a 15 metre storage length be constructed, regardless of whether the subject development is built;
- **Blenheim Road and Parkwood Drive:** It is recommended that an auxiliary westbound left-turn lane with a 75 metre storage length be constructed. 65 metres of the storage length is warranted regardless of whether the subject development is built;
- **Blenheim Road and Blair Road:** It is recommended that an auxiliary eastbound left-turn lane with a 70 metre storage length be constructed. 50 metres of the storage length is warranted regardless of whether the subject development is built; and
- **Blair Road and George Street North (9):** It is recommended that the Region of Waterloo continue to review the need for enhanced traffic control at this intersection at appropriate intervals.

Appendix A

Pre-Study Conference Form

WESTWOOD VILLAGE PHASE 2
PRE-STUDY CONFERENCE FORM

Item	Description	Details
INTRODUCTION		
1	Nature of application (Attach a drawing)	○ Official Plan Amendment ○ Zoning Amendment ○ Plan of Subdivision
2	TIS process, and relevant policies, procedures and approvals	○ Guidelines for the preparation of Transportation Impact Studies in Support of Development Applications ○ Transportation Impact Studies Requirements for Capacity Analysis, Roundabouts, Turn Lanes ○ Safety Analysis Checklist ○ Policy and Procedures for Access onto Regional Roads
3	Public Meeting	○ Not Required
CONTEXT		
4	Study intersections (Intersections to be analyzed) Note: the consultant is responsible to identify any further intersections impacted as the study progresses.	○ Blair Road & George Street North ○ Blair Road & Princess Street ○ Blair Road & Bismark Drive ○ Blenheim Road & Bismark Drive (new) ○ Roseville Road & Edworthy Side Road ○ Parkwood Road & Blenheim Road ○ Blair Road & George Street South ○ Blenheim Road & Blair Road ○ Park Hill Road & Water Street ○ Park Hill Road & Ainslie Street ○
5	Size and number of phases of development	○ Singles/Semis: 405 ○ Multi-Residential: 162 ○ ○ Unit numbers being refined
6	Approved and pending approval development applications	○ Cambridge West ○ ○ ○
7	Planned transportation system improvements	○ Blenheim Road realignment ○

Item	Description	Details
TRAVEL DEMAND		
8	Horizon years	○ 2031 (consistent with Cambridge West TIS)
9	Peak hour determination	○ AM weekday peak hour of adjacent roadway ○ PM weekday peak hour of adjacent roadway ○
10	Background	○ 0.5 – 1.5% growth rates (consistent with Cambridge West TIS)
11	Trip generation	○ ITE fitted equations ○ Higher number of units if given range by developer
12	Trip reductions (TDM, internal, pass-by)	○ Use the same methodology for the schools/commercial as was used before (for trips remaining within Cambridge West) ○ Region to inform Mode Share values
13	Trip distribution	○ 2016 TTS Data (as used in Cambridge West TIS)
14	Trip assignment	○ Local traffic pattern ○ Site layout and access design ○
EVALUATION OF IMPACTS		
15	Traffic impact analysis (Use approved software)	○ Unsignalized intersections ○ left turn warrant analysis ○ signal warrant analysis ○ Signalized intersections ○ LOS, v/c, delay, queuing ○ ROW saturation flow rates ○ Existing signal timings for existing conditions ○ Optimize signal timings for future conditions ○ Queuing analysis ○ Roundabouts ○ Other…
16	Roundabout feasibility (Use approved software)	○ Initial screening ○ Intersection control study (10 year horizon)
17	Transit assessment	○ Frequency and hours of service ○ Presence of bus stops ○ Reliability of service ○ Passenger loads

Item	Description	Details
		○ Travel time ○ Other
18	Pedestrian assessment	○ Presence, connectivity, and width of sidewalks ○ Barriers and buffers from traffic ○ Crossing opportunities at intersections ○ Delay at intersections ○ Number of driveways and traffic volumes at the driveways ○ Presence of illumination ○ Other
19	Cycling assessment	○ Presence of a dedicated facility ○ Network connectivity ○ Number and width of travel lanes adjacent to the route ○ Volume and speed of traffic ○ Percentage of trucks and buses encountered ○ Pavement condition ○ Presence of parking /showers/change rooms ○ Other
20	Safety analysis	○ Road safety review ○ Collision risk analysis ○ Access conflict evaluation
21	Site access and circulation	○ Review sight distances at all new access points ○ Internal traffic controls ○ Loading facilities and access ○ Service/maintenance vehicle access ○ Emergency vehicle access

Appendix B

Existing Traffic Operations

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	467	53	16	729	176	13
Future Volume (vph)	467	53	16	729	176	13
Ideal Flow (vphpl)	1900	1750	1775	1900	1765	1765
Storage Length (m)		70.0	30.0		0.0	0.0
Storage Lanes		1	1		1	0
Taper Length (m)			85.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.991	
Flt Protected			0.950		0.956	
Satd. Flow (prot)	1863	1377	1492	1863	1657	0
Flt Permitted			0.950		0.956	
Satd. Flow (perm)	1863	1377	1492	1863	1657	0
Link Speed (k/h)	80			60	50	
Link Distance (m)	198.8			217.2	70.9	
Travel Time (s)	8.9			13.0	5.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	8%	13%	2%	1%	0%
Adj. Flow (vph)	467	53	16	729	176	13
Shared Lane Traffic (%)						
Lane Group Flow (vph)	467	53	16	729	189	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 56.4%		ICU Level of Service B	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	12.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	467	53	16	729	176	13
Future Vol, veh/h	467	53	16	729	176	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	700	300	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	8	13	2	1	0
Mvmt Flow	467	53	16	729	176	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	520	0	1228	467
Stage 1	-	-	-	-	467	-
Stage 2	-	-	-	-	761	-
Critical Hdwy	-	-	4.23	-	6.41	6.2
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.317	-	3.509	3.3
Pot Cap-1 Maneuver	-	-	992	-	198	600
Stage 1	-	-	-	-	633	-
Stage 2	-	-	-	-	463	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	992	-	195	600
Mov Cap-2 Maneuver	-	-	-	-	195	-
Stage 1	-	-	-	-	633	-
Stage 2	-	-	-	-	456	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	93.5
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	204	-	-	992	-
HCM Lane V/C Ratio	0.926	-	-	0.016	-
HCM Control Delay (s)	93.5	-	-	8.7	-
HCM Lane LOS	F	-	-	A	-
HCM 95th %tile Q(veh)	7.5	-	-	0	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	70	37	9	104	49	22
Future Volume (vph)	70	37	9	104	49	22
Ideal Flow (vphpl)	1765	1765	1650	1650	1650	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.953				0.958	
Flt Protected	0.968			0.996		
Satd. Flow (prot)	1618	0	0	1574	1459	0
Flt Permitted	0.968			0.996		
Satd. Flow (perm)	1618	0	0	1574	1459	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	148.9			459.2	116.3	
Travel Time (s)	10.7			33.1	8.4	
Confl. Peds. (#/hr)			2			2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	0%	44%	1%	8%	9%
Adj. Flow (vph)	70	37	9	104	49	22
Shared Lane Traffic (%)						
Lane Group Flow (vph)	107	0	0	113	71	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	26.8%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	70	37	9	104	49	22
Future Vol, veh/h	70	37	9	104	49	22
Conflicting Peds, #/hr	0	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	1	0	44	1	8	9
Mvmt Flow	70	37	9	104	49	22

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	184	62	73	0	-	0
Stage 1	62	-	-	-	-	-
Stage 2	122	-	-	-	-	-
Critical Hdwy	6.41	6.2	4.54	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.3	2.596	-	-	-
Pot Cap-1 Maneuver	808	1009	1298	-	-	-
Stage 1	963	-	-	-	-	-
Stage 2	906	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	799	1007	1296	-	-	-
Mov Cap-2 Maneuver	799	-	-	-	-	-
Stage 1	954	-	-	-	-	-
Stage 2	904	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.8	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1296	-	860	-	-
HCM Lane V/C Ratio	0.007	-	0.124	-	-
HCM Control Delay (s)	7.8	0	9.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	20	109	4	27	13	85	43	6	12	95	4
Future Volume (vph)	19	20	109	4	27	13	85	43	6	12	95	4
Ideal Flow (vphpl)	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550
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		0.901			0.960			0.994			0.995	
Flt Protected		0.994			0.995			0.969			0.995	
Satd. Flow (prot)	0	1303	0	0	1413	0	0	1399	0	0	1472	0
Flt Permitted		0.994			0.995			0.969			0.995	
Satd. Flow (perm)	0	1303	0	0	1413	0	0	1399	0	0	1472	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		242.7			135.8			104.7			319.1	
Travel Time (s)		17.5			9.8			7.5			23.0	
Confl. Peds. (#/hr)	26					26	28					28
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	11%	5%	6%	0%	4%	8%	8%	5%	0%	0%	5%	0%
Adj. Flow (vph)	19	20	109	4	27	13	85	43	6	12	95	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	148	0	0	44	0	0	134	0	0	111	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 38.2%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	6.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	19	20	109	4	27	13	85	43	6	12	95	4
Future Vol, veh/h	19	20	109	4	27	13	85	43	6	12	95	4
Conflicting Peds, #/hr	26	0	0	0	0	26	28	0	0	0	0	28
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	11	5	6	0	4	8	8	5	0	0	5	0
Mvmt Flow	19	20	109	4	27	13	85	43	6	12	95	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	411	368	125	402	367	72	127	0	0	49	0	0
Stage 1	149	149	-	216	216	-	-	-	-	-	-	-
Stage 2	262	219	-	186	151	-	-	-	-	-	-	-
Critical Hdwy	7.21	6.55	6.26	7.1	6.54	6.28	4.18	-	-	4.1	-	-
Critical Hdwy Stg 1	6.21	5.55	-	6.1	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.21	5.55	-	6.1	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.599	4.045	3.354	3.5	4.036	3.372	2.272	-	-	2.2	-	-
Pot Cap-1 Maneuver	536	556	915	562	559	974	1423	-	-	1571	-	-
Stage 1	833	768	-	791	720	-	-	-	-	-	-	-
Stage 2	724	716	-	820	769	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	458	504	893	453	507	953	1389	-	-	1571	-	-
Mov Cap-2 Maneuver	458	504	-	453	507	-	-	-	-	-	-	-
Stage 1	762	743	-	741	675	-	-	-	-	-	-	-
Stage 2	628	671	-	695	744	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.2	11.7	4.9	0.8
HCM LOS	B	B		

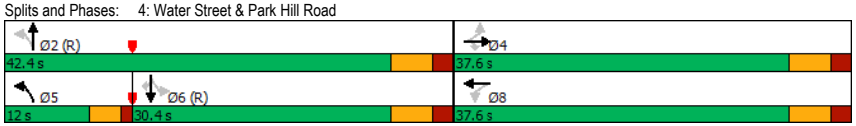
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1389	-	-	728	581	1571	-	-
HCM Lane V/C Ratio	0.061	-	-	0.203	0.076	0.008	-	-
HCM Control Delay (s)	7.8	0	-	11.2	11.7	7.3	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.8	0.2	0	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	876	127	3	243	2	225	193	36	7	350	341
Future Volume (vph)	2	876	127	3	243	2	225	193	36	7	350	341
Ideal Flow (vphpl)	1775	1775	1750	1775	1650	1650	1775	1650	1650	1775	1900	1750
Storage Length (m)	0.0		10.0	0.0		0.0	22.0		0.0	38.0		0.0
Storage Lanes	0		1	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			20.0			50.0		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00	0.97	1.00	1.00		0.99	1.00		1.00		0.96
Frt			0.850		0.999			0.976				0.850
Flt Protected				0.950			0.950			0.950		
Satd. Flow (prot)	0	3339	1473	1686	1600	0	1670	1523	0	1686	1610	1458
Flt Permitted		0.955		0.208			0.300			0.616		
Satd. Flow (perm)	0	3189	1430	369	1600	0	522	1523	0	1092	1610	1394
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95		1			16				341
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		179.1			108.9			140.9			142.0	
Travel Time (s)		12.9			7.8			10.1			10.2	
Confl. Peds. (#/hr)	6		4	4		6	11		1	1		11
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	1%	0%	3%	0%	1%	6%	3%	0%	18%	2%
Adj. Flow (vph)	2	876	127	3	243	2	225	193	36	7	350	341
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	878	127	3	245	0	225	229	0	7	350	341
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		5	2		6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0		9.5	24.0		24.0	24.0	24.0
Total Split (s)	37.6	37.6	37.6	37.6	37.6		12.0	42.4		30.4	30.4	30.4
Total Split (%)	47.0%	47.0%	47.0%	47.0%	47.0%		15.0%	53.0%		38.0%	38.0%	38.0%
Maximum Green (s)	31.6	31.6	31.6	31.6	31.6		8.0	36.4		24.4	24.4	24.4
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		3.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		1.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0	-2.0	-2.0		0.0	-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max	Max		None	C-Max		C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0			11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0			0		0	0	0
Act Effct Green (s)		33.6	33.6	33.6	33.6		38.4	38.4		26.4	26.4	26.4
Actuated g/C Ratio		0.42	0.42	0.42	0.42		0.48	0.48		0.33	0.33	0.33
v/c Ratio		0.66	0.19	0.02	0.36		0.62	0.31		0.02	0.66	0.50

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		21.5	6.0	21.0	18.3		20.9	13.2		18.4	30.0	5.2
Queue Delay		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay		21.5	6.0	21.0	18.3		20.9	13.2		18.4	30.0	5.2
LOS		C	A	C	B		C	B		B	C	A
Approach Delay		19.5			18.3			17.0			17.8	
Approach LOS		B			B			B			B	
Queue Length 50th (m)		53.6	2.8	0.2	14.8		19.3	18.4		0.7	44.4	0.0
Queue Length 95th (m)		72.8	12.1	m0.7	37.6		33.1	32.7		3.3	71.9	16.7
Internal Link Dist (m)		155.1			84.9			116.9			118.0	
Turn Bay Length (m)			10.0				22.0			38.0		
Base Capacity (vph)		1339	655	154	672		365	739		360	531	688
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		0.66	0.19	0.02	0.36		0.62	0.31		0.02	0.66	0.50

Intersection Summary		
Area Type:	Other	
Cycle Length: 80		
Actuated Cycle Length: 80		
Offset: 40 (50%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green		
Natural Cycle: 60		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.66		
Intersection Signal Delay: 18.4	Intersection LOS: B	
Intersection Capacity Utilization 69.2%	ICU Level of Service C	
Analysis Period (min) 15		
m Volume for 95th percentile queue is metered by upstream signal.		

Splits and Phases: 4: Water Street & Park Hill Road



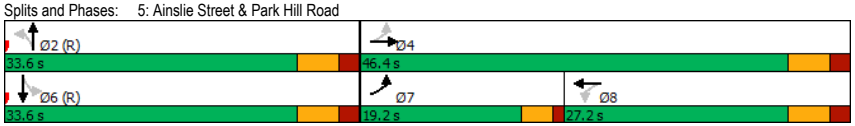
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	876	127	3	243	2	225	193	36	7	350	341
Future Volume (veh/h)	2	876	127	3	243	2	225	193	36	7	350	341
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1775	1761	1736	1775	1611	1650	1761	1573	1611	1775	1633	1723
Adj Flow Rate, veh/h	2	876	127	3	243	2	225	193	36	7	350	341
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	1	1	0	3	0	1	6	3	0	18	2
Cap, veh/h	46	1378	614	201	670	6	344	618	115	448	539	474
Arrive On Green	0.39	0.42	0.42	0.28	0.28	0.26	0.10	0.48	0.46	0.33	0.33	0.33
Sat Flow, veh/h	1	3282	1461	533	1596	13	1677	1287	240	1085	1633	1436
Grp Volume(v), veh/h	471	407	127	3	0	245	225	0	229	7	350	341
Grp Sat Flow(s),veh/h/ln	1760	1523	1461	533	0	1609	1677	0	1527	1085	1633	1436
Q Serve(g_s), s	0.0	16.9	4.4	0.4	0.0	9.8	7.1	0.0	7.4	0.3	14.6	16.7
Cycle Q Clear(g_c), s	17.3	16.9	4.4	17.3	0.0	9.8	7.1	0.0	7.4	0.3	14.6	16.7
Prop In Lane	0.00		1.00	1.00		0.01	1.00		0.16	1.00		1.00
Lane Grp Cap(c), veh/h	741	639	614	201	0	676	344	0	733	448	539	474
V/C Ratio(X)	0.64	0.64	0.21	0.01	0.00	0.36	0.65	0.00	0.31	0.02	0.65	0.72
Avail Cap(c_a), veh/h	741	639	614	201	0	676	344	0	733	448	539	474
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.86	0.00	0.86	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.5	18.4	14.7	30.2	0.0	20.2	17.5	0.0	12.8	18.1	22.9	23.5
Incr Delay (d2), s/veh	4.1	4.8	0.8	0.1	0.0	1.3	4.4	0.0	1.1	0.1	6.0	9.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	2.1	0.5	0.0	0.0	1.1	1.0	0.0	0.5	0.0	2.8	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.6	23.2	15.5	30.3	0.0	21.5	21.9	0.0	13.9	18.1	28.8	32.7
LnGrp LOS	C	C	B	C	A	C	C	A	B	B	C	C
Approach Vol, veh/h		1005			248			454			698	
Approach Delay, s/veh		21.9			21.6			17.9			30.6	
Approach LOS		C			C			B			C	
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		42.4		37.6	12.0	30.4		37.6				
Change Period (Y+Rc), s		6.0		6.0	4.0	6.0		6.0				
Max Green Setting (Gmax), s		36.4		31.6	8.0	24.4		31.6				
Max Q Clear Time (g_c+I1), s		9.4		19.3	9.1	18.7		19.3				
Green Ext Time (p_c), s		1.6		5.5	0.0	2.1		1.2				
Intersection Summary												
HCM 6th Ctrl Delay			23.6									
HCM 6th LOS			C									

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	509	388	30	11	208	7	26	540	10	7	182	7
Future Volume (vph)	509	388	30	11	208	7	26	540	10	7	182	7
Ideal Flow (vphpl)	1775	1650	1650	1650	1650	1650	1775	1650	1650	1550	1550	1550
Storage Length (m)	0.0		0.0	0.0		0.0	30.0		0.0	10.0		0.0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00			1.00			1.00			1.00	
Frt		0.989			0.996			0.997			0.995	
Flt Protected	0.950				0.998			0.998			0.998	
Satd. Flow (prot)	1670	1606	0	0	1609	0	0	2914	0	0	1361	0
Flt Permitted	0.419				0.973			0.936			0.978	
Satd. Flow (perm)	733	1606	0	0	1569	0	0	2733	0	0	1333	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			2			2			3	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		108.9			106.9			99.2			139.1	
Travel Time (s)		7.8			7.7			7.1			10.0	
Confl. Peds. (#/hr)	7		3	3		7	5		18	18		5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	7%	0%	2%	0%	8%	7%	0%	0%	14%	0%
Adj. Flow (vph)	509	388	30	11	208	7	26	540	10	7	182	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	509	418	0	0	226	0	0	576	0	0	196	0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	21.2		21.2	21.2		27.6	27.6		27.6	27.6	
Minimum Split (s)	9.0	27.2		27.2	27.2		33.6	33.6		33.6	33.6	
Total Split (s)	19.2	46.4		27.2	27.2		33.6	33.6		33.6	33.6	
Total Split (%)	24.0%	58.0%		34.0%	34.0%		42.0%	42.0%		42.0%	42.0%	
Maximum Green (s)	15.2	40.4		21.2	21.2		27.6	27.6		27.6	27.6	
Yellow Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	-2.0			-2.0			-2.0			-2.0	
Total Lost Time (s)	4.0	4.0			4.0			4.0			4.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	42.4	42.4			23.2			29.6			29.6	
Actuated g/C Ratio	0.53	0.53			0.29			0.37			0.37	
v/c Ratio	0.90	0.49			0.50			0.57			0.40	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	34.5	2.7			27.8			22.8			21.3	
Queue Delay	0.0	0.1			0.0			0.0			0.0	
Total Delay	34.5	2.8			27.8			22.8			21.3	
LOS	C	A			C			C			C	
Approach Delay		20.2			27.8			22.8			21.3	
Approach LOS		C			C			C			C	
Queue Length 50th (m)	29.2	2.9			27.7			35.4			20.9	
Queue Length 95th (m)	#78.6	4.3			47.9			50.8			37.8	
Internal Link Dist (m)		84.9			82.9			75.2			115.1	
Turn Bay Length (m)												
Base Capacity (vph)	566	854			456			1012			495	
Starvation Cap Reductn	0	25			0			0			0	
Spillback Cap Reductn	0	0			0			0			0	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.90	0.50			0.50			0.57			0.40	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 35 (44%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 22.0		Intersection LOS: C	
Intersection Capacity Utilization 84.7%		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.			

Splits and Phases: 5: Ainslie Street & Park Hill Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	509	388	30	11	208	7	26	540	10	7	182	7
Future Volume (veh/h)	509	388	30	11	208	7	26	540	10	7	182	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		0.99	0.99		0.97	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1761	1637	1560	1650	1624	1650	1664	1560	1650	1550	1381	1550
Adj Flow Rate, veh/h	509	388	30	11	208	7	26	540	10	7	182	7
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	1	1	7	0	2	0	8	7	0	0	14	0
Cap, veh/h	654	795	61	56	437	14	74	1040	19	52	478	18
Arrive On Green	0.25	0.70	0.67	0.27	0.29	0.27	0.34	0.37	0.34	0.34	0.37	0.34
Sat Flow, veh/h	1677	1499	116	30	1508	49	67	2812	51	14	1291	48
Grp Volume(v), veh/h	509	0	418	226	0	0	301	0	275	196	0	0
Grp Sat Flow(s),veh/h/ln	1677	0	1615	1587	0	0	1521	0	1409	1354	0	0
Q Serve(g_s), s	15.2	0.0	9.4	0.0	0.0	0.0	0.0	0.0	12.3	0.0	0.0	0.0
Cycle Q Clear(g_c), s	15.2	0.0	9.4	9.4	0.0	0.0	12.3	0.0	12.3	8.5	0.0	0.0
Prop In Lane	1.00		0.07	0.05		0.03	0.09		0.04	0.04		0.04
Lane Grp Cap(c), veh/h	654	0	856	468	0	0	574	0	521	514	0	0
V/C Ratio(X)	0.78	0.00	0.49	0.48	0.00	0.00	0.52	0.00	0.53	0.38	0.00	0.00
Avail Cap(c_a), veh/h	654	0	856	468	0	0	574	0	521	514	0	0
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.71	0.00	0.71	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	15.6	0.0	7.0	23.6	0.0	0.0	19.8	0.0	19.8	18.6	0.0	0.0
Incr Delay (d2), s/veh	4.3	0.0	1.4	3.5	0.0	0.0	3.4	0.0	3.8	2.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	0.3	2.0	0.0	0.0	2.0	0.0	1.7	1.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.9	0.0	8.4	27.1	0.0	0.0	23.2	0.0	23.6	20.8	0.0	0.0
LnGrp LOS	B	A	A	C	A	A	C	A	C	C	A	A
Approach Vol, veh/h		927			226			576			196	
Approach Delay, s/veh		14.7			27.1			23.4			20.8	
Approach LOS		B			C			C			C	
Timer - Assigned Phs		2			4		6	7	8			
Phs Duration (G+Y+Rc), s		33.6			46.4		33.6	19.2	27.2			
Change Period (Y+Rc), s		6.0			6.0		6.0	4.0	6.0			
Max Green Setting (Gmax), s		27.6			40.4		27.6	15.2	21.2			
Max Q Clear Time (g_c+I1), s		14.3			11.4		10.5	17.2	11.4			
Green Ext Time (p_c), s		3.3			3.3		1.1	0.0	1.0			

Intersection Summary		
HCM 6th Ctrl Delay		19.4
HCM 6th LOS		B

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	155	153	8	190	325	9
Future Volume (vph)	155	153	8	190	325	9
Ideal Flow (vphpl)	1650	1650	0	1650	1765	1765
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.933				0.996	
Flt Protected				0.998	0.954	
Satd. Flow (prot)	1363	0	0	1516	1585	0
Flt Permitted				0.998	0.954	
Satd. Flow (perm)	1363	0	0	1516	1585	0
Link Speed (k/h)	60			60	60	
Link Distance (m)	163.9			177.2	162.3	
Travel Time (s)	9.8			10.6	9.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	6%	20%	0%	9%	6%	0%
Adj. Flow (vph)	155	153	8	190	325	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	308	0	0	198	334	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 46.8%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	155	153	8	190	325	9
Future Vol, veh/h	155	153	8	190	325	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	6	20	0	9	6	0
Mvmt Flow	155	153	8	190	325	9

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	308	0	438	232
Stage 1	-	-	-	-	232	-
Stage 2	-	-	-	-	206	-
Critical Hdwy	-	-	4.1	-	6.46	6.2
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	-	-	2.2	-	3.554	3.3
Pot Cap-1 Maneuver	-	-	1264	-	569	812
Stage 1	-	-	-	-	797	-
Stage 2	-	-	-	-	819	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1264	-	565	812
Mov Cap-2 Maneuver	-	-	-	-	565	-
Stage 1	-	-	-	-	797	-
Stage 2	-	-	-	-	813	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	19.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	570	-	-	1264	-
HCM Lane V/C Ratio	0.586	-	-	0.006	-
HCM Control Delay (s)	19.9	-	-	7.9	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	3.8	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	153	20	60	131	61	171
Future Volume (vph)	153	20	60	131	61	171
Ideal Flow (vphpl)	1650	1650	0	1650	1765	1765
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.984				0.900	
Flt Protected				0.985	0.987	
Satd. Flow (prot)	1555	0	0	1590	1545	0
Flt Permitted				0.985	0.987	
Satd. Flow (perm)	1555	0	0	1590	1545	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	91.2			171.5	132.1	
Travel Time (s)	6.6			12.3	9.5	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	15%	7%	0%	0%	2%
Adj. Flow (vph)	153	20	60	131	61	171
Shared Lane Traffic (%)						
Lane Group Flow (vph)	173	0	0	191	232	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 90.6%		ICU Level of Service E	
Analysis Period (min) 15			

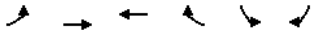
Intersection	
Int Delay, s/veh	5.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	153	20	60	131	61	171
Future Vol, veh/h	153	20	60	131	61	171
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	3	15	7	0	0	2
Mvmt Flow	153	20	60	131	61	171

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	174	0	415	164
Stage 1	-	-	-	-	164	-
Stage 2	-	-	-	-	251	-
Critical Hdwy	-	-	4.17	-	6.4	6.22
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.263	-	3.5	3.318
Pot Cap-1 Maneuver	-	-	1373	-	598	881
Stage 1	-	-	-	-	870	-
Stage 2	-	-	-	-	795	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1372	-	569	880
Mov Cap-2 Maneuver	-	-	-	-	569	-
Stage 1	-	-	-	-	869	-
Stage 2	-	-	-	-	758	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.4	11.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	769	-	-	1372	-
HCM Lane V/C Ratio	0.302	-	-	0.044	-
HCM Control Delay (s)	11.7	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	1.3	-	-	0.1	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	309	137	72	3	33	170
Future Volume (vph)	309	137	72	3	33	170
Ideal Flow (vphpl)	1650	1650	1650	1650	1765	1765
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.995		0.887	
Flt Protected		0.967			0.992	
Satd. Flow (prot)	0	1564	1642	0	1496	0
Flt Permitted		0.967			0.992	
Satd. Flow (perm)	0	1564	1642	0	1496	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		501.6	92.7		100.6	
Travel Time (s)		36.1	6.7		7.2	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	0%	0%	3%	4%
Adj. Flow (vph)	309	137	72	3	33	170
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	446	75	0	203	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 54.6%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	6.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	309	137	72	3	33	170
Future Vol, veh/h	309	137	72	3	33	170
Conflicting Peds, #/hr	5	0	0	5	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	0	0	3	4
Mvmt Flow	309	137	72	3	33	170

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	80	0	-	0	834	79
Stage 1	-	-	-	-	79	-
Stage 2	-	-	-	-	755	-
Critical Hdwy	4.12	-	-	-	6.43	6.24
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.218	-	-	-	3.527	3.336
Pot Cap-1 Maneuver	1518	-	-	-	337	976
Stage 1	-	-	-	-	942	-
Stage 2	-	-	-	-	462	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1512	-	-	-	261	972
Mov Cap-2 Maneuver	-	-	-	-	261	-
Stage 1	-	-	-	-	731	-
Stage 2	-	-	-	-	460	-

Approach	EB	WB	SB
HCM Control Delay, s	5.5	0	12.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1512	-	-	-	674
HCM Lane V/C Ratio	0.204	-	-	-	0.301
HCM Control Delay (s)	8	0	-	-	12.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.8	-	-	-	1.3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	40	81	3	42	90	39	227	2	13	207	16
Future Volume (vph)	59	40	81	3	42	90	39	227	2	13	207	16
Ideal Flow (vphpl)	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550
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		0.939			0.910			0.999			0.991	
Flt Protected		0.984			0.999			0.993			0.997	
Satd. Flow (prot)	0	1387	0	0	1391	0	0	1475	0	0	1480	0
Flt Permitted		0.984			0.999			0.993			0.997	
Satd. Flow (perm)	0	1387	0	0	1391	0	0	1475	0	0	1480	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		72.9			55.4			112.0			136.8	
Travel Time (s)		5.2			4.0			8.1			9.8	
Confl. Peds. (#/hr)			1	1			2		2	2		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	0%	5%	0%	0%	2%	0%	5%	0%	0%	4%	0%
Adj. Flow (vph)	59	40	81	3	42	90	39	227	2	13	207	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	180	0	0	135	0	0	268	0	0	236	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 63.9%		ICU Level of Service B	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	10.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	59	40	81	3	42	90	39	227	2	13	207	16
Future Vol, veh/h	59	40	81	3	42	90	39	227	2	13	207	16
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	3	0	5	0	0	2	0	5	0	0	4	0
Mvmt Flow	59	40	81	3	42	90	39	227	2	13	207	16
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.2	9.4	11.3	10.7
HCM LOS	B	A	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	15%	33%	2%	6%
Vol Thru, %	85%	22%	31%	88%
Vol Right, %	1%	45%	67%	7%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	268	180	135	236
LT Vol	39	59	3	13
Through Vol	227	40	42	207
RT Vol	2	81	90	16
Lane Flow Rate	268	180	135	236
Geometry Grp	1	1	1	1
Degree of Util (X)	0.381	0.263	0.192	0.335
Departure Headway (Hd)	5.116	5.269	5.112	5.109
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	705	682	702	703
Service Time	3.144	3.303	3.147	3.138
HCM Lane V/C Ratio	0.38	0.264	0.192	0.336
HCM Control Delay	11.3	10.2	9.4	10.7
HCM Lane LOS	B	B	A	B
HCM 95th-tile Q	1.8	1.1	0.7	1.5

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	691	207	37	645	59	12
Future Volume (vph)	691	207	37	645	59	12
Ideal Flow (vphpl)	1900	1750	1775	1900	1765	1765
Storage Length (m)		70.0	30.0		0.0	0.0
Storage Lanes		1	1		1	0
Taper Length (m)			85.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.977	
Flt Protected			0.950		0.960	
Satd. Flow (prot)	1881	1458	1686	1863	1615	0
Flt Permitted			0.950		0.960	
Satd. Flow (perm)	1881	1458	1686	1863	1615	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	198.8			217.2	70.9	
Travel Time (s)	14.3			15.6	5.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	0%	2%	3%	0%
Adj. Flow (vph)	691	207	37	645	59	12
Shared Lane Traffic (%)						
Lane Group Flow (vph)	691	207	37	645	71	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 47.3%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	691	207	37	645	59	12
Future Vol, veh/h	691	207	37	645	59	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	700	300	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	1	2	0	2	3	0
Mvmt Flow	691	207	37	645	59	12

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	898	0	1410	691
Stage 1	-	-	-	-	691	-
Stage 2	-	-	-	-	719	-
Critical Hdwy	-	-	4.1	-	6.43	6.2
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.2	-	3.527	3.3
Pot Cap-1 Maneuver	-	-	765	-	152	448
Stage 1	-	-	-	-	495	-
Stage 2	-	-	-	-	481	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	765	-	145	448
Mov Cap-2 Maneuver	-	-	-	-	145	-
Stage 1	-	-	-	-	495	-
Stage 2	-	-	-	-	458	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	42.7
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	164	-	-	765	-
HCM Lane V/C Ratio	0.433	-	-	0.048	-
HCM Control Delay (s)	42.7	-	-	9.9	-
HCM Lane LOS	E	-	-	A	-
HCM 95th %tile Q(veh)	2	-	-	0.2	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	25	12	15	52	150	70
Future Volume (vph)	25	12	15	52	150	70
Ideal Flow (vphpl)	1765	1765	1650	1650	1650	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.956				0.957	
Flt Protected	0.967			0.989		
Satd. Flow (prot)	1632	0	0	1517	1549	0
Flt Permitted	0.967			0.989		
Satd. Flow (perm)	1632	0	0	1517	1549	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	148.9			459.2	116.3	
Travel Time (s)	10.7			33.1	8.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	27%	2%	1%	4%
Adj. Flow (vph)	25	12	15	52	150	70
Shared Lane Traffic (%)						
Lane Group Flow (vph)	37	0	0	67	220	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 28.2%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	25	12	15	52	150	70
Future Vol, veh/h	25	12	15	52	150	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	27	2	1	4
Mvmt Flow	25	12	15	52	150	70

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	267	185	220	0	-	0
Stage 1	185	-	-	-	-	-
Stage 2	82	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.37	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.443	-	-	-
Pot Cap-1 Maneuver	727	862	1215	-	-	-
Stage 1	852	-	-	-	-	-
Stage 2	946	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	718	862	1215	-	-	-
Mov Cap-2 Maneuver	718	-	-	-	-	-
Stage 1	841	-	-	-	-	-
Stage 2	946	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10	1.8	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1215	-	759	-	-
HCM Lane V/C Ratio	0.012	-	0.049	-	-
HCM Control Delay (s)	8	0	10	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	4	8	65	10	42	14	75	53	3	17	125	11
Future Volume (vph)	4	8	65	10	42	14	75	53	3	17	125	11
Ideal Flow (vphpl)	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550
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		0.886			0.971			0.997			0.990	
Flt Protected		0.997			0.992			0.972			0.994	
Satd. Flow (prot)	0	1346	0	0	1493	0	0	1494	0	0	1501	0
Flt Permitted		0.997			0.992			0.972			0.994	
Satd. Flow (perm)	0	1346	0	0	1493	0	0	1494	0	0	1501	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		242.7			135.8			104.7			319.1	
Travel Time (s)		17.5			9.8			7.5			23.0	
Confl. Peds. (#/hr)	3		1	1		3	5					5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	1%	0%	0%	0%	2%	0%
Adj. Flow (vph)	4	8	65	10	42	14	75	53	3	17	125	11
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	77	0	0	66	0	0	131	0	0	153	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 38.2%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	8	65	10	42	14	75	53	3	17	125	11
Future Vol, veh/h	4	8	65	10	42	14	75	53	3	17	125	11
Conflicting Peds, #/hr	3	0	1	1	0	3	5	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	2	0	0	0	1	0	0	0	2	0
Mvmt Flow	4	8	65	10	42	14	75	53	3	17	125	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	406	376	137	407	380	58	141	0	0	56	0	0
Stage 1	170	170	-	205	205	-	-	-	-	-	-	-
Stage 2	236	206	-	202	175	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.22	7.1	6.5	6.2	4.11	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.318	3.5	4	3.3	2.209	-	-	2.2	-	-
Pot Cap-1 Maneuver	559	558	911	558	556	1014	1448	-	-	1562	-	-
Stage 1	837	762	-	802	736	-	-	-	-	-	-	-
Stage 2	772	735	-	805	758	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	488	519	906	486	518	1011	1442	-	-	1562	-	-
Mov Cap-2 Maneuver	488	519	-	486	518	-	-	-	-	-	-	-
Stage 1	788	750	-	759	696	-	-	-	-	-	-	-
Stage 2	675	695	-	730	746	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.9	12.1	4.4	0.8
HCM LOS	A	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1442	-	-	808	571	1562	-	-
HCM Lane V/C Ratio	0.052	-	-	0.095	0.116	0.011	-	-
HCM Control Delay (s)	7.6	0	-	9.9	12.1	7.3	0	-
HCM Lane LOS	A	A	-	A	B	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.3	0.4	0	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	665	152	8	415	9	218	172	46	11	589	715
Future Volume (vph)	27	665	152	8	415	9	218	172	46	11	589	715
Ideal Flow (vphpl)	1775	1775	1750	1775	1650	1650	1775	1650	1650	1775	1900	1750
Storage Length (m)	0.0		10.0	0.0		0.0	22.0		0.0	38.0		0.0
Storage Lanes	0		1	1		0	1		0	1		1
Taper Length (m)	7.5			7.5			20.0			50.0		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850		0.997			0.968				0.850
Flt Protected		0.998		0.950			0.950			0.950		
Satd. Flow (prot)	0	3334	1473	1686	1629	0	1670	1585	0	1686	1863	1473
Flt Permitted		0.868		0.247			0.173			0.622		
Satd. Flow (perm)	0	2899	1473	438	1629	0	304	1585	0	1104	1863	1473
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			95		1			28				212
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		179.1			108.9			140.9			142.0	
Travel Time (s)		12.9			7.8			10.1			10.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	1%	1%	0%	0%	2%	1%
Adj. Flow (vph)	27	665	152	8	415	9	218	172	46	11	589	715
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	692	152	8	424	0	218	218	0	11	589	715
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8			2			6		6
Detector Phase	4	4	4	8	8		5	2		6	6	6
Switch Phase												
Minimum Initial (s)	24.4	24.4	24.4	24.4	24.4		5.0	32.4		32.4	32.4	32.4
Minimum Split (s)	30.4	30.4	30.4	30.4	30.4		9.0	38.4		38.4	38.4	38.4
Total Split (s)	30.4	30.4	30.4	30.4	30.4		11.2	49.6		38.4	38.4	38.4
Total Split (%)	38.0%	38.0%	38.0%	38.0%	38.0%		14.0%	62.0%		48.0%	48.0%	48.0%
Maximum Green (s)	24.4	24.4	24.4	24.4	24.4		7.2	43.6		32.4	32.4	32.4
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0		3.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		1.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0	-2.0	-2.0		0.0	-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)		4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max	Max		None	C-Max		C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0			7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0			11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0			0		0	0	0
Act Effct Green (s)		26.4	26.4	26.4	26.4		45.6	45.6		34.4	34.4	34.4
Actuated g/C Ratio		0.33	0.33	0.33	0.33		0.57	0.57		0.43	0.43	0.43
v/c Ratio		0.72	0.28	0.06	0.79		0.74	0.24		0.02	0.74	0.95
Control Delay		28.8	9.9	27.9	43.1		26.1	8.2		13.5	25.7	39.9
Queue Delay		0.0	0.0	0.0	2.4		0.0	0.0		0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		28.8	9.9	27.9	45.4		26.1	8.2		13.5	25.7	39.9
LOS		C	A	C	D		C	A		B	C	D
Approach Delay		25.4			45.1			17.1			33.3	
Approach LOS		C			D			B			C	
Queue Length 50th (m)		47.4	5.9	1.2	69.7		14.8	12.8		0.9	71.1	75.6
Queue Length 95th (m)		66.4	18.3	m1.5	m82.3		#33.7	23.4		3.7	108.5	#149.7
Internal Link Dist (m)		155.1			84.9			116.9			118.0	
Turn Bay Length (m)			10.0				22.0			38.0		
Base Capacity (vph)		956	549	144	538		296	915		474	801	754
Starvation Cap Reductn		0	0	0	43		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		0.72	0.28	0.06	0.86		0.74	0.24		0.02	0.74	0.95

Intersection Summary		
Area Type:	Other	
Cycle Length: 80		
Actuated Cycle Length: 80		
Offset: 63.6 (80%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green		
Natural Cycle: 80		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.95		
Intersection Signal Delay: 30.5	Intersection LOS: C	
Intersection Capacity Utilization 104.8%	ICU Level of Service G	
Analysis Period (min) 15		
# 95th percentile volume exceeds capacity, queue may be longer.		
Queue shown is maximum after two cycles.		
m Volume for 95th percentile queue is metered by upstream signal.		

Splits and Phases: 4: Water Street & Park Hill Road

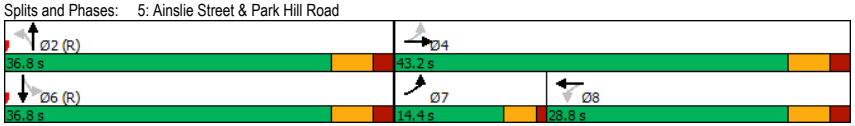
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	665	152	8	415	9	218	172	46	11	589	715
Future Volume (veh/h)	27	665	152	8	415	9	218	172	46	11	589	715
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1775	1761	1736	1775	1637	1650	1761	1637	1650	1775	1870	1736
Adj Flow Rate, veh/h	27	665	152	8	415	9	218	172	46	11	589	715
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	1	1	0	1	0	1	1	0	0	2	1
Cap, veh/h	66	967	486	172	527	11	298	709	190	565	804	633
Arrive On Green	0.31	0.33	0.33	0.66	0.66	0.61	0.09	0.57	0.55	0.43	0.43	0.43
Sat Flow, veh/h	51	2930	1471	635	1596	35	1677	1244	333	1104	1870	1471
Grp Volume(v), veh/h	340	352	152	8	0	424	218	0	218	11	589	715
Grp Sat Flow(s),veh/h/ln	1459	1523	1471	635	0	1631	1677	0	1577	1104	1870	1471
Q Serve(g_s), s	3.1	16.1	6.2	0.8	0.0	14.8	5.7	0.0	5.6	0.5	21.0	34.4
Cycle Q Clear(g_c), s	17.8	16.1	6.2	16.9	0.0	14.8	5.7	0.0	5.6	0.5	21.0	34.4
Prop In Lane	0.08		1.00	1.00		0.02	1.00		0.21	1.00		1.00
Lane Grp Cap(c), veh/h	494	502	486	172	0	538	298	0	899	565	804	633
V/C Ratio(X)	0.69	0.70	0.31	0.05	0.00	0.79	0.73	0.00	0.24	0.02	0.73	1.13
Avail Cap(c_a), veh/h	494	502	486	172	0	538	298	0	899	565	804	633
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.35	0.00	0.35	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.0	23.4	20.0	18.1	0.0	11.7	16.5	0.0	8.7	13.1	19.0	22.8
Incr Delay (d2), s/veh	7.7	7.9	1.7	0.2	0.0	4.2	8.9	0.0	0.6	0.1	5.8	77.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	3.1	1.0	0.0	0.0	1.7	0.7	0.0	0.2	0.0	3.1	15.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.6	31.3	21.7	18.3	0.0	15.8	25.4	0.0	9.3	13.2	24.8	100.0
LnGrp LOS	C	C	C	B	A	B	C	A	A	B	C	F
Approach Vol, veh/h		844			432			436			1315	
Approach Delay, s/veh		29.3			15.9			17.4			65.6	
Approach LOS		C			B			B			E	
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		49.6		30.4	11.2	38.4		30.4				
Change Period (Y+Rc), s		6.0		6.0	4.0	6.0		6.0				
Max Green Setting (Gmax), s		43.6		24.4	7.2	32.4		24.4				
Max Q Clear Time (g_c+I1), s		7.6		19.8	7.7	36.4		18.9				
Green Ext Time (p_c), s		1.6		2.2	0.0	0.0		1.4				
Intersection Summary												
HCM 6th Ctrl Delay			41.4									
HCM 6th LOS			D									

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	351	305	47	27	380	22	40	543	13	9	378	30
Future Volume (vph)	351	305	47	27	380	22	40	543	13	9	378	30
Ideal Flow (vphpl)	1775	1650	1650	1650	1650	1650	1775	1650	1650	1550	1550	1550
Storage Length (m)	0.0		0.0	0.0		0.0	30.0		0.0	10.0		0.0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (m)	7.5			7.5			7.5			7.5		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor		0.99			1.00			1.00			1.00	
Frt		0.980			0.993			0.997			0.990	
Flt Protected	0.950				0.997			0.997			0.999	
Satd. Flow (prot)	1670	1586	0	0	1618	0	0	2893	0	0	1486	0
Flt Permitted	0.253				0.961			0.906			0.985	
Satd. Flow (perm)	445	1586	0	0	1558	0	0	2628	0	0	1465	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			4			3			6	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		108.9			106.9			99.2			139.1	
Travel Time (s)		7.8			7.7			7.1			10.0	
Confl. Peds. (#/hr)	6		9	9		6	12		7	7		12
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	4%	0%	1%	0%	5%	8%	0%	0%	3%	3%
Adj. Flow (vph)	351	305	47	27	380	22	40	543	13	9	378	30
Shared Lane Traffic (%)												
Lane Group Flow (vph)	351	352	0	0	429	0	0	596	0	0	417	0
Turn Type	pm+pt	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	22.8		22.8	22.8		30.8	30.8		30.8	30.8	
Minimum Split (s)	9.0	28.8		28.8	28.8		36.8	36.8		36.8	36.8	
Total Split (s)	14.4	43.2		28.8	28.8		36.8	36.8		36.8	36.8	
Total Split (%)	18.0%	54.0%		36.0%	36.0%		46.0%	46.0%		46.0%	46.0%	
Maximum Green (s)	10.4	37.2		22.8	22.8		30.8	30.8		30.8	30.8	
Yellow Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	-2.0			-2.0			-2.0			-2.0	
Total Lost Time (s)	4.0	4.0			4.0			4.0			4.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	39.2	39.2			24.8			32.8			32.8	
Actuated g/C Ratio	0.49	0.49			0.31			0.41			0.41	
v/c Ratio	0.93	0.45			0.88			0.55			0.69	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	39.7	8.4			48.5			20.3			26.4	
Queue Delay	0.0	1.6			0.1			0.6			2.9	
Total Delay	39.7	10.0			48.6			20.9			29.2	
LOS	D	B			D			C			C	
Approach Delay		24.8			48.6			20.9			29.2	
Approach LOS		C			D			C			C	
Queue Length 50th (m)	48.9	48.6			60.1			34.6			49.2	
Queue Length 95th (m)	m#95.6	m75.2			#111.1			49.8			81.0	
Internal Link Dist (m)		84.9			82.9			75.2			115.1	
Turn Bay Length (m)												
Base Capacity (vph)	377	784			485			1079			604	
Starvation Cap Reductn	0	266			0			0			0	
Spillback Cap Reductn	0	0			1			179			100	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.93	0.68			0.89			0.66			0.83	

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 1.6 (2%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.93			
Intersection Signal Delay: 29.3		Intersection LOS: C	
Intersection Capacity Utilization 96.4%		ICU Level of Service F	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 5: Ainslie Street & Park Hill Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	351	305	47	27	380	22	40	543	13	9	378	30
Future Volume (veh/h)	351	305	47	27	380	22	40	543	13	9	378	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		0.99	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1761	1637	1599	1650	1637	1650	1706	1547	1650	1550	1514	1514
Adj Flow Rate, veh/h	351	305	47	27	380	22	40	543	13	9	378	30
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	1	1	4	0	1	0	5	8	0	0	3	3
Cap, veh/h	420	678	104	64	447	25	97	1092	26	50	559	44
Arrive On Green	0.04	0.16	0.15	0.29	0.31	0.29	0.38	0.41	0.38	0.38	0.41	0.38
Sat Flow, veh/h	1677	1383	213	54	1443	81	112	2664	63	10	1364	107
Grp Volume(v), veh/h	351	0	352	429	0	0	306	0	290	417	0	0
Grp Sat Flow(s),veh/h/ln	1677	0	1596	1577	0	0	1443	0	1395	1481	0	0
Q Serve(g_s), s	10.4	0.0	16.0	11.1	0.0	0.0	0.0	0.0	12.4	0.0	0.0	0.0
Cycle Q Clear(g_c), s	10.4	0.0	16.0	21.3	0.0	0.0	11.9	0.0	12.4	18.8	0.0	0.0
Prop In Lane	1.00		0.13	0.06		0.05	0.13		0.04	0.02		0.07
Lane Grp Cap(c), veh/h	420	0	782	497	0	0	607	0	572	616	0	0
V/C Ratio(X)	0.84	0.00	0.45	0.86	0.00	0.00	0.50	0.00	0.51	0.68	0.00	0.00
Avail Cap(c_a), veh/h	420	0	782	497	0	0	607	0	572	616	0	0
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.63	0.00	0.63	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	18.8	0.0	23.8	26.4	0.0	0.0	17.5	0.0	17.6	19.5	0.0	0.0
Incr Delay (d2), s/veh	9.1	0.0	1.2	17.7	0.0	0.0	3.0	0.0	3.2	5.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0	0.9	5.6	0.0	0.0	1.7	0.0	1.4	2.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.0	0.0	25.0	44.0	0.0	0.0	20.5	0.0	20.8	25.4	0.0	0.0
LnGrp LOS	C	A	C	D	A	A	C	A	C	C	A	A
Approach Vol, veh/h		703			429			596			417	
Approach Delay, s/veh		26.5			44.0			20.6			25.4	
Approach LOS		C			D			C			C	

Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		36.8		43.2		36.8	14.4	28.8				
Change Period (Y+Rc), s		6.0		6.0		6.0	4.0	6.0				
Max Green Setting (Gmax), s		30.8		37.2		30.8	10.4	22.8				
Max Q Clear Time (g_c+I1), s		14.4		18.0		20.8	12.4	23.3				
Green Ext Time (p_c), s		3.9		2.4		2.1	0.0	0.0				

Intersection Summary		
HCM 6th Ctrl Delay	28.2	
HCM 6th LOS	C	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	181	314	14	179	186	13
Future Volume (vph)	181	314	14	179	186	13
Ideal Flow (vphpl)	1650	1650	0	1650	1765	1765
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.914				0.991	
Flt Protected				0.996	0.955	
Satd. Flow (prot)	1431	0	0	1599	1541	0
Flt Permitted				0.996	0.955	
Satd. Flow (perm)	1431	0	0	1599	1541	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	163.9			177.2	162.3	
Travel Time (s)	11.8			12.8	11.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	6%	5%	0%	3%	9%	0%
Adj. Flow (vph)	181	314	14	179	186	13
Shared Lane Traffic (%)						
Lane Group Flow (vph)	495	0	0	193	199	0
Sign Control	Free			Free	Stop	

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

Intersection	
Int Delay, s/veh	4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	181	314	14	179	186	13
Future Vol, veh/h	181	314	14	179	186	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	6	5	0	3	9	0
Mvmt Flow	181	314	14	179	186	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	495	0	545	338
Stage 1	-	-	-	-	338	-
Stage 2	-	-	-	-	207	-
Critical Hdwy	-	-	4.1	-	6.49	6.2
Critical Hdwy Stg 1	-	-	-	-	5.49	-
Critical Hdwy Stg 2	-	-	-	-	5.49	-
Follow-up Hdwy	-	-	2.2	-	3.581	3.3
Pot Cap-1 Maneuver	-	-	1079	-	488	709
Stage 1	-	-	-	-	707	-
Stage 2	-	-	-	-	811	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1079	-	481	709
Mov Cap-2 Maneuver	-	-	-	-	481	-
Stage 1	-	-	-	-	707	-
Stage 2	-	-	-	-	800	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	17.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	491	-	-	1079	-
HCM Lane V/C Ratio	0.405	-	-	0.013	-
HCM Control Delay (s)	17.2	-	-	8.4	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.9	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	159	48	174	182	20	100
Future Volume (vph)	159	48	174	182	20	100
Ideal Flow (vphpl)	1650	1650	0	1650	1765	1765
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.969				0.887	
Flt Protected				0.976	0.992	
Satd. Flow (prot)	1599	0	0	1586	1553	0
Flt Permitted				0.976	0.992	
Satd. Flow (perm)	1599	0	0	1586	1553	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	91.2			171.5	132.1	
Travel Time (s)	6.6			12.3	9.5	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	1%	2%	0%	0%
Adj. Flow (vph)	159	48	174	182	20	100
Shared Lane Traffic (%)						
Lane Group Flow (vph)	207	0	0	356	120	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 204.3%		ICU Level of Service H	
Analysis Period (min) 15			

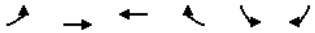
Intersection	
Int Delay, s/veh	4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	159	48	174	182	20	100
Future Vol, veh/h	159	48	174	182	20	100
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	1	2	0	0
Mvmt Flow	159	48	174	182	20	100

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	208	0	714	184
Stage 1	-	-	-	-	184	-
Stage 2	-	-	-	-	530	-
Critical Hdwy	-	-	4.11	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.209	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1369	-	401	864
Stage 1	-	-	-	-	852	-
Stage 2	-	-	-	-	594	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1368	-	344	863
Mov Cap-2 Maneuver	-	-	-	-	344	-
Stage 1	-	-	-	-	851	-
Stage 2	-	-	-	-	510	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.9	11.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	690	-	-	1368	-
HCM Lane V/C Ratio	0.174	-	-	0.127	-
HCM Control Delay (s)	11.3	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0.4	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	213	138	168	13	33	333
Future Volume (vph)	213	138	168	13	33	333
Ideal Flow (vphpl)	1650	1650	1650	1650	1765	1765
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.990		0.877	
Flt Protected		0.971			0.996	
Satd. Flow (prot)	0	1571	1634	0	1484	0
Flt Permitted		0.971			0.996	
Satd. Flow (perm)	0	1571	1634	0	1484	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		501.6	92.7		100.6	
Travel Time (s)		36.1	6.7		7.2	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	0%	0%	3%	4%
Adj. Flow (vph)	213	138	168	13	33	333
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	351	181	0	366	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 67.5%		ICU Level of Service C	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	7.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	213	138	168	13	33	333
Future Vol, veh/h	213	138	168	13	33	333
Conflicting Peds, #/hr	5	0	0	5	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	0	0	3	4
Mvmt Flow	213	138	168	13	33	333

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	186	0	-	0	744	180
Stage 1	-	-	-	-	180	-
Stage 2	-	-	-	-	564	-
Critical Hdwy	4.12	-	-	-	6.43	6.24
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.218	-	-	-	3.527	3.336
Pot Cap-1 Maneuver	1388	-	-	-	381	858
Stage 1	-	-	-	-	849	-
Stage 2	-	-	-	-	567	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1382	-	-	-	315	854
Mov Cap-2 Maneuver	-	-	-	-	315	-
Stage 1	-	-	-	-	705	-
Stage 2	-	-	-	-	565	-

Approach	EB	WB	SB
HCM Control Delay, s	4.9	0	14.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1382	-	-	-	740
HCM Lane V/C Ratio	0.154	-	-	-	0.495
HCM Control Delay (s)	8.1	0	-	-	14.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.5	-	-	-	2.8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	39	74	5	99	80	50	184	5	10	356	39
Future Volume (vph)	51	39	74	5	99	80	50	184	5	10	356	39
Ideal Flow (vphpl)	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550
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		0.939			0.941			0.997			0.987	
Flt Protected		0.985			0.999			0.990			0.999	
Satd. Flow (prot)	0	1427	0	0	1438	0	0	1501	0	0	1528	0
Flt Permitted		0.985			0.999			0.990			0.999	
Satd. Flow (perm)	0	1427	0	0	1438	0	0	1501	0	0	1528	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		72.9			55.4			112.0			136.8	
Travel Time (s)		5.2			4.0			8.1			9.8	
Confl. Peds. (#/hr)	2		3	3		2	4		5	5		4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	1%	0%	0%	3%	2%	2%	0%	0%	0%	0%
Adj. Flow (vph)	51	39	74	5	99	80	50	184	5	10	356	39
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	164	0	0	184	0	0	239	0	0	405	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 80.0%		ICU Level of Service D	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	13.2
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	51	39	74	5	99	80	50	184	5	10	356	39
Future Vol, veh/h	51	39	74	5	99	80	50	184	5	10	356	39
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	0	0	1	0	0	3	2	2	0	0	0	0
Mvmt Flow	51	39	74	5	99	80	50	184	5	10	356	39
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.9	11.1	12	15.7
HCM LOS	B	B	B	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	21%	31%	3%	2%
Vol Thru, %	77%	24%	54%	88%
Vol Right, %	2%	45%	43%	10%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	239	164	184	405
LT Vol	50	51	5	10
Through Vol	184	39	99	356
RT Vol	5	74	80	39
Lane Flow Rate	239	164	184	405
Geometry Grp	1	1	1	1
Degree of Util (X)	0.373	0.263	0.291	0.591
Departure Headway (Hd)	5.614	5.778	5.691	5.254
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	638	618	627	684
Service Time	3.676	3.851	3.762	3.308
HCM Lane V/C Ratio	0.375	0.265	0.293	0.592
HCM Control Delay	12	10.9	11.1	15.7
HCM Lane LOS	B	B	B	C
HCM 95th-tile Q	1.7	1.1	1.2	3.9

Appendix C

2031 Background Traffic Operations

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	500	111	17	800	306	14
Future Volume (vph)	500	111	17	800	306	14
Ideal Flow (vphpl)	1900	1750	1775	1900	1765	1765
Storage Length (m)		70.0	30.0		0.0	0.0
Storage Lanes		1	1		1	0
Taper Length (m)			85.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.994	
Flt Protected			0.950		0.954	
Satd. Flow (prot)	1863	1377	1492	1863	1658	0
Flt Permitted			0.950		0.954	
Satd. Flow (perm)	1863	1377	1492	1863	1658	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	198.8			217.2	70.9	
Travel Time (s)	14.3			15.6	5.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	8%	13%	2%	1%	0%
Adj. Flow (vph)	500	111	17	800	306	14
Shared Lane Traffic (%)						
Lane Group Flow (vph)	500	111	17	800	320	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 67.9%		ICU Level of Service C	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	82.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	500	111	17	800	306	14
Future Vol, veh/h	500	111	17	800	306	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	700	300	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	8	13	2	1	0
Mvmt Flow	500	111	17	800	306	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	611	0	1334	500
Stage 1	-	-	-	-	500	-
Stage 2	-	-	-	-	834	-
Critical Hdwy	-	-	4.23	-	6.41	6.2
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.317	-	3.509	3.3
Pot Cap-1 Maneuver	-	-	917	-	~ 171	575
Stage 1	-	-	-	-	611	-
Stage 2	-	-	-	-	428	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	917	-	~ 168	575
Mov Cap-2 Maneuver	-	-	-	-	~ 168	-
Stage 1	-	-	-	-	611	-
Stage 2	-	-	-	-	420	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	$ 449.1
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	173	-	-	917	-
HCM Lane V/C Ratio	1.85	-	-	0.019	-
HCM Control Delay (s)	$ 449.1	-	-	9	-
HCM Lane LOS	F	-	-	A	-
HCM 95th %tile Q(veh)	23.5	-	-	0.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	161	65	18	143	70	60
Future Volume (vph)	161	65	18	143	70	60
Ideal Flow (vphpl)	1765	1765	1650	1650	1650	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.961				0.938	
Flt Protected	0.966			0.994		
Satd. Flow (prot)	1627	0	0	1550	1427	0
Flt Permitted	0.966			0.994		
Satd. Flow (perm)	1627	0	0	1550	1427	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	148.9			459.2	116.3	
Travel Time (s)	10.7			33.1	8.4	
Confl. Peds. (#/hr)			2			2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	0%	44%	1%	8%	9%
Adj. Flow (vph)	161	65	18	143	70	60
Shared Lane Traffic (%)						
Lane Group Flow (vph)	226	0	0	161	130	0
Sign Control	Stop			Free	Free	

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

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	161	65	18	143	70	60
Future Vol, veh/h	161	65	18	143	70	60
Conflicting Peds, #/hr	0	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	1	0	44	1	8	9
Mvmt Flow	161	65	18	143	70	60

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	281	102	132	0	-	0
Stage 1	102	-	-	-	-	-
Stage 2	179	-	-	-	-	-
Critical Hdwy	6.41	6.2	4.54	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.3	2.596	-	-	-
Pot Cap-1 Maneuver	711	959	1231	-	-	-
Stage 1	925	-	-	-	-	-
Stage 2	854	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	697	957	1229	-	-	-
Mov Cap-2 Maneuver	697	-	-	-	-	-
Stage 1	908	-	-	-	-	-
Stage 2	852	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.8	0.9	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1229	-	756	-	-
HCM Lane V/C Ratio	0.015	-	0.299	-	-
HCM Control Delay (s)	8	0	11.8	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	1.3	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	21	160	4	29	14	109	54	6	13	130	19
Future Volume (vph)	52	21	160	4	29	14	109	54	6	13	130	19
Ideal Flow (vphpl)	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550
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		0.907			0.960			0.995			0.984	
Flt Protected		0.989			0.996			0.969			0.996	
Satd. Flow (prot)	0	1299	0	0	1413	0	0	1400	0	0	1460	0
Flt Permitted		0.989			0.996			0.969			0.996	
Satd. Flow (perm)	0	1299	0	0	1413	0	0	1400	0	0	1460	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		242.7			135.8			104.7			319.1	
Travel Time (s)		17.5			9.8			7.5			23.0	
Confl. Peds. (#/hr)	26					26	28					28
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	11%	5%	6%	0%	4%	8%	8%	5%	0%	0%	5%	0%
Adj. Flow (vph)	52	21	160	4	29	14	109	54	6	13	130	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	233	0	0	47	0	0	169	0	0	162	0
Sign Control		Stop			Stop			Free			Free	

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

Intersection	
Int Delay, s/veh	8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	52	21	160	4	29	14	109	54	6	13	130	19
Future Vol, veh/h	52	21	160	4	29	14	109	54	6	13	130	19
Conflicting Peds, #/hr	26	0	0	0	0	26	28	0	0	0	0	28
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	11	5	6	0	4	8	8	5	0	0	5	0
Mvmt Flow	52	21	160	4	29	14	109	54	6	13	130	19

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	517	472	168	531	478	83	177	0	0	60	0	0
Stage 1	194	194	-	275	275	-	-	-	-	-	-	-
Stage 2	323	278	-	256	203	-	-	-	-	-	-	-
Critical Hdwy	7.21	6.55	6.26	7.1	6.54	6.28	4.18	-	-	4.1	-	-
Critical Hdwy Stg 1	6.21	5.55	-	6.1	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.21	5.55	-	6.1	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.599	4.045	3.354	3.5	4.036	3.372	2.272	-	-	2.2	-	-
Pot Cap-1 Maneuver	455	486	866	462	484	960	1364	-	-	1556	-	-
Stage 1	787	734	-	736	679	-	-	-	-	-	-	-
Stage 2	670	675	-	753	730	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	377	430	845	335	428	939	1332	-	-	1556	-	-
Mov Cap-2 Maneuver	377	430	-	335	428	-	-	-	-	-	-	-
Stage 1	703	710	-	673	621	-	-	-	-	-	-	-
Stage 2	563	618	-	587	706	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.3	13	5.1	0.6
HCM LOS	B	B		

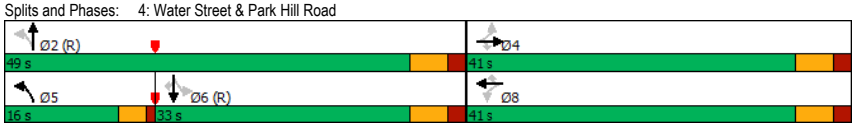
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1332	-	-	619	497	1556	-	-
HCM Lane V/C Ratio	0.082	-	-	0.376	0.095	0.008	-	-
HCM Control Delay (s)	7.9	0	-	14.3	13	7.3	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.3	-	-	1.7	0.3	0	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	1085	136	3	259	2	240	206	38	7	378	431
Future Volume (vph)	2	1085	136	3	259	2	240	206	38	7	378	431
Ideal Flow (vphpl)	1775	1775	1750	1775	1650	1650	1775	1650	1650	1775	1900	1750
Storage Length (m)	0.0		10.0	0.0		15.0	22.0		0.0	38.0		0.0
Storage Lanes	0		1	0		1	1		0	1		1
Taper Length (m)	7.5			7.5			20.0			50.0		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00	0.97			0.97	0.99	1.00		1.00		0.97
Frt			0.850			0.850		0.977				0.850
Flt Protected					0.999		0.950			0.950		
Satd. Flow (prot)	0	3339	1473	0	1601	1402	1670	1522	0	1686	1610	1458
Flt Permitted		0.955			0.989		0.267			0.607		
Satd. Flow (perm)	0	3189	1429	0	1585	1354	467	1522	0	1076	1610	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			85			85		15				421
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		179.1			108.9			140.9			142.0	
Travel Time (s)		12.9			7.8			10.1			10.2	
Confl. Peds. (#/hr)	6		4	4		6	11		1	1		11
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	1%	0%	3%	0%	1%	6%	3%	0%	18%	2%
Adj. Flow (vph)	2	1085	136	3	259	2	240	206	38	7	378	431
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1087	136	0	262	2	240	244	0	7	378	431
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8		8	2			6		6
Detector Phase	4	4	4	8	8	8	5	2		6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	9.5	24.0		24.0	24.0	24.0
Total Split (s)	41.0	41.0	41.0	41.0	41.0	41.0	16.0	49.0		33.0	33.0	33.0
Total Split (%)	45.6%	45.6%	45.6%	45.6%	45.6%	45.6%	17.8%	54.4%		36.7%	36.7%	36.7%
Maximum Green (s)	35.0	35.0	35.0	35.0	35.0	35.0	12.0	43.0		27.0	27.0	27.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0		-2.0	0.0	0.0	-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)		4.0	4.0		4.0	6.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max	Max	Max	None	C-Max		C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0		11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0		0		0	0	0
Act Effct Green (s)		37.0	37.0		37.0	35.0	45.0	45.0		29.8	29.8	29.8
Actuated g/C Ratio		0.41	0.41		0.41	0.39	0.50	0.50		0.33	0.33	0.33
v/c Ratio		0.83	0.21		0.40	0.00	0.63	0.32		0.02	0.71	0.57

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		30.5	8.2		4.1	0.0	21.1	13.9		21.1	35.4	6.2
Queue Delay		0.6	0.0		0.2	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		31.1	8.2		4.3	0.0	21.1	13.9		21.1	35.4	6.2
LOS		C	A		A	A	C	B		C	D	A
Approach Delay		28.6			4.2			17.5			19.9	
Approach LOS		C			A			B			B	
Queue Length 50th (m)		90.7	5.5		7.1	0.0	24.3	23.4		0.9	60.5	1.2
Queue Length 95th (m)		118.6	17.0		9.6	m0.0	40.0	39.8		4.0	#95.4	24.0
Internal Link Dist (m)		155.1			84.9			116.9			118.0	
Turn Bay Length (m)			10.0			15.0	22.0			38.0		
Base Capacity (vph)		1311	637		651	578	393	768		356	533	750
Starvation Cap Reductn		0	0		60	0	0	0		0	0	0
Spillback Cap Reductn		51	0		0	0	0	19		0	0	0
Storage Cap Reductn		0	0		0	0	0	0		0	0	0
Reduced v/c Ratio		0.86	0.21		0.44	0.00	0.61	0.33		0.02	0.71	0.57

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 21.8		Intersection LOS: C	
Intersection Capacity Utilization 77.7%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 4: Water Street & Park Hill Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	1085	136	3	259	2	240	206	38	7	378	431
Future Volume (veh/h)	2	1085	136	3	259	2	240	206	38	7	378	431
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1775	1761	1736	1775	1611	1650	1761	1573	1611	1775	1633	1723
Adj Flow Rate, veh/h	2	1085	136	3	259	2	240	206	38	7	378	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	1	1	0	3	0	1	6	3	0	18	2
Cap, veh/h	41	1349	601	42	656	540	386	644	119	443	556	
Arrive On Green	0.39	0.41	0.41	0.14	0.14	0.13	0.11	0.50	0.48	0.34	0.34	0.00
Sat Flow, veh/h	1	3282	1461	4	1595	1388	1677	1289	238	1066	1633	1460
Grp Volume(v), veh/h	583	504	136	262	0	2	240	0	244	7	378	0
Grp Sat Flow(s),veh/h/ln	1761	1523	1461	1599	0	1388	1677	0	1527	1066	1633	1460
Q Serve(g_s), s	0.0	26.2	5.4	0.0	0.0	0.1	8.2	0.0	8.6	0.4	17.9	0.0
Cycle Q Clear(g_c), s	27.0	26.2	5.4	13.4	0.0	0.1	8.2	0.0	8.6	0.4	17.9	0.0
Prop In Lane	0.00		1.00	0.01		1.00	1.00		0.16	1.00		1.00
Lane Grp Cap(c), veh/h	725	626	601	698	0	540	386	0	763	443	556	
V/C Ratio(X)	0.80	0.81	0.23	0.38	0.00	0.00	0.62	0.00	0.32	0.02	0.68	
Avail Cap(c_a), veh/h	725	626	601	698	0	540	417	0	763	443	556	
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.82	0.00	0.82	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.6	23.3	17.2	28.7	0.0	24.0	18.5	0.0	13.5	19.7	25.5	0.0
Incr Delay (d2), s/veh	9.2	10.6	0.9	1.3	0.0	0.0	2.5	0.0	1.1	0.1	6.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.0	5.0	0.8	2.3	0.0	0.0	1.1	0.0	0.8	0.0	3.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.8	33.9	18.1	29.9	0.0	24.0	21.0	0.0	14.6	19.8	32.0	0.0
LnGrp LOS	C	C	B	C	A	C	C	A	B	B	C	
Approach Vol, veh/h		1223			264			484			385	A
Approach Delay, s/veh		31.6			29.9			17.8			31.8	
Approach LOS		C			C			B			C	
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		49.0		41.0	14.3	34.7		41.0				
Change Period (Y+Rc), s		6.0		6.0	4.0	6.0		6.0				
Max Green Setting (Gmax), s		43.0		35.0	12.0	27.0		35.0				
Max Q Clear Time (g_c+I1), s		10.6		29.0	10.2	19.9		15.4				
Green Ext Time (p_c), s		1.8		4.0	0.2	1.5		1.7				

Intersection Summary		
HCM 6th Ctrl Delay		28.6
HCM 6th LOS		C

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

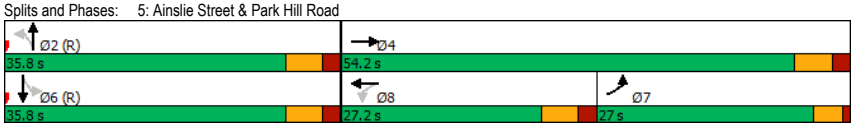
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	694	414	32	12	222	7	28	603	11	7	194	7
Future Volume (vph)	694	414	32	12	222	7	28	603	11	7	194	7
Ideal Flow (vphpl)	1775	1650	1650	1650	1650	1650	1775	1650	1650	1550	1550	1550
Storage Length (m)	50.0		0.0	0.0		0.0	30.0		0.0	10.0		0.0
Storage Lanes	2		0	1		0	0		0	0		0
Taper Length (m)	15.0			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		1.00	1.00			1.00			1.00	
Frt		0.989			0.995			0.997			0.995	
Flt Protected	0.950			0.950				0.998			0.998	
Satd. Flow (prot)	3239	1606	0	1568	1609	0	0	2914	0	0	1360	0
Flt Permitted	0.950			0.288				0.934			0.977	
Satd. Flow (perm)	3198	1606	0	474	1609	0	0	2726	0	0	1331	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			2			2			2	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		108.9			106.9			99.2			139.1	
Travel Time (s)		7.8			7.7			7.1			10.0	
Confl. Peds. (#/hr)	7		3	3		7	5		18	18		5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	7%	0%	2%	0%	8%	7%	0%	0%	14%	0%
Adj. Flow (vph)	694	414	32	12	222	7	28	603	11	7	194	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	694	446	0	12	229	0	0	642	0	0	208	0
Turn Type	Prot	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Detector Phase	7	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	21.2		21.2	21.2		27.6	27.6		27.6	27.6	
Minimum Split (s)	9.0	27.2		27.2	27.2		33.6	33.6		33.6	33.6	
Total Split (s)	27.0	54.2		27.2	27.2		35.8	35.8		35.8	35.8	
Total Split (%)	30.0%	60.2%		30.2%	30.2%		39.8%	39.8%		39.8%	39.8%	
Maximum Green (s)	23.0	48.2		21.2	21.2		29.8	29.8		29.8	29.8	
Yellow Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	-2.0		0.0	-2.0			-2.0			-2.0	
Total Lost Time (s)	4.0	4.0		6.0	4.0			4.0			4.0	
Lead/Lag	Lag			Lead	Lead							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	23.0	50.2		21.2	23.2			31.8			31.8	
Actuated g/C Ratio	0.26	0.56		0.24	0.26			0.35			0.35	
v/c Ratio	0.84	0.50		0.11	0.55			0.67			0.44	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	23.9	1.7		30.1	34.5			28.6			25.8	
Queue Delay	0.9	0.8		0.0	0.0			0.0			0.0	
Total Delay	24.8	2.5		30.1	34.5			28.6			25.8	
LOS	C	A		C	C			C			C	
Approach Delay		16.1			34.3			28.6			25.8	
Approach LOS		B			C			C			C	
Queue Length 50th (m)	68.9	1.8		1.7	35.7			51.1			28.3	
Queue Length 95th (m)	m#87.3	m2.7		6.6	59.4			70.8			49.0	
Internal Link Dist (m)		84.9			82.9			75.2			115.1	
Turn Bay Length (m)	50.0											
Base Capacity (vph)	827	898		111	416			964			471	
Starvation Cap Reductn	28	210		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.87	0.65		0.11	0.55			0.67			0.44	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 22.6		Intersection LOS: C	
Intersection Capacity Utilization 85.0%		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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Ainslie Street & Park Hill Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	694	414	32	12	222	7	28	603	11	7	194	7
Future Volume (veh/h)	694	414	32	12	222	7	28	603	11	7	194	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	0.99		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1761	1637	1560	1650	1624	1650	1664	1560	1650	1550	1381	1550
Adj Flow Rate, veh/h	694	414	32	12	222	7	28	603	11	7	194	7
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	1	1	7	0	2	0	8	7	0	0	14	0
Cap, veh/h	788	850	66	80	404	13	95	1806	32	52	834	29
Arrive On Green	0.08	0.19	0.18	0.24	0.26	0.24	0.62	0.65	0.62	0.62	0.65	0.62
Sat Flow, veh/h	3254	1499	116	833	1565	49	81	2791	50	16	1289	45
Grp Volume(v), veh/h	694	0	446	12	0	229	333	0	309	208	0	0
Grp Sat Flow(s),veh/h/ln	1627	0	1615	833	0	1615	1512	0	1410	1350	0	0
Q Serve(g_s), s	19.0	0.0	22.2	0.0	0.0	11.0	0.0	0.0	8.9	0.0	0.0	0.0
Cycle Q Clear(g_c), s	19.0	0.0	22.2	21.2	0.0	11.0	8.8	0.0	8.9	5.7	0.0	0.0
Prop In Lane	1.00		0.07	1.00		0.03	0.08		0.04	0.03		0.03
Lane Grp Cap(c), veh/h	788	0	915	80	0	416	988	0	912	885	0	0
V/C Ratio(X)	0.88	0.00	0.49	0.15	0.00	0.55	0.34	0.00	0.34	0.24	0.00	0.00
Avail Cap(c_a), veh/h	832	0	915	80	0	416	988	0	912	885	0	0
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.46	0.00	0.46	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	40.1	0.0	24.9	45.0	0.0	28.9	7.2	0.0	7.2	6.6	0.0	0.0
Incr Delay (d2), s/veh	5.2	0.0	0.9	3.9	0.0	5.2	0.9	0.0	1.0	0.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	0.0	0.7	0.3	0.0	2.7	0.3	0.0	0.3	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.3	0.0	25.8	48.9	0.0	34.1	8.1	0.0	8.2	7.3	0.0	0.0
LnGrp LOS	D	A	C	D	A	C	A	A	A	A	A	A
Approach Vol, veh/h		1140			241			642			208	
Approach Delay, s/veh		37.7			34.8			8.2			7.3	
Approach LOS		D			C			A			A	

Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		63.0		55.0		63.0	27.8	27.2				
Change Period (Y+Rc), s		6.0		6.0		6.0	6.0	* 6				
Max Green Setting (Gmax), s		29.8		48.2		29.8	23.0	* 21				
Max Q Clear Time (g_c+I1), s		10.9		24.2		7.7	21.0	23.2				
Green Ext Time (p_c), s		4.5		3.5		1.3	0.8	0.0				

Intersection Summary		
HCM 6th Ctrl Delay	26.0	
HCM 6th LOS	C	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	221	186	17	307	394	14
Future Volume (vph)	221	186	17	307	394	14
Ideal Flow (vphpl)	1650	1650	0	1650	1765	1765
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.938				0.995	
Flt Protected				0.997	0.954	
Satd. Flow (prot)	1377	0	0	1516	1584	0
Flt Permitted				0.997	0.954	
Satd. Flow (perm)	1377	0	0	1516	1584	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	163.9			177.2	162.3	
Travel Time (s)	11.8			12.8	11.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	6%	20%	0%	9%	6%	0%
Adj. Flow (vph)	221	186	17	307	394	14
Shared Lane Traffic (%)						
Lane Group Flow (vph)	407	0	0	324	408	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 65.7%		ICU Level of Service C	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	24

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	221	186	17	307	394	14
Future Vol, veh/h	221	186	17	307	394	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	6	20	0	9	6	0
Mvmt Flow	221	186	17	307	394	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	407	0	655	314
Stage 1	-	-	-	-	314	-
Stage 2	-	-	-	-	341	-
Critical Hdwy	-	-	4.1	-	6.46	6.2
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	-	-	2.2	-	3.554	3.3
Pot Cap-1 Maneuver	-	-	1163	-	425	731
Stage 1	-	-	-	-	732	-
Stage 2	-	-	-	-	711	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1163	-	417	731
Mov Cap-2 Maneuver	-	-	-	-	417	-
Stage 1	-	-	-	-	732	-
Stage 2	-	-	-	-	698	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	66.8
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	423	-	-	1163	-
HCM Lane V/C Ratio	0.965	-	-	0.015	-
HCM Control Delay (s)	66.8	-	-	8.1	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	11.5	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	467	100	89	294	126	259
Future Volume (vph)	467	100	89	294	126	259
Ideal Flow (vphpl)	1650	1650	0	1650	1765	1765
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.976				0.909	
Flt Protected				0.989	0.984	
Satd. Flow (prot)	1532	0	0	1606	1558	0
Flt Permitted				0.989	0.984	
Satd. Flow (perm)	1532	0	0	1606	1558	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	91.2			171.5	132.1	
Travel Time (s)	6.6			12.3	9.5	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	15%	7%	0%	0%	2%
Adj. Flow (vph)	467	100	89	294	126	259
Shared Lane Traffic (%)						
Lane Group Flow (vph)	567	0	0	383	385	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	138.3%	ICU Level of Service	H
Analysis Period (min)	15		

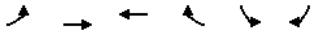
Intersection	
Int Delay, s/veh	21.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	467	100	89	294	126	259
Future Vol, veh/h	467	100	89	294	126	259
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	3	15	7	0	0	2
Mvmt Flow	467	100	89	294	126	259

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	568	0	990	518
Stage 1	-	-	-	-	518	-
Stage 2	-	-	-	-	472	-
Critical Hdwy	-	-	4.17	-	6.4	6.22
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.263	-	3.5	3.318
Pot Cap-1 Maneuver	-	-	980	-	276	558
Stage 1	-	-	-	-	602	-
Stage 2	-	-	-	-	632	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	979	-	246	558
Mov Cap-2 Maneuver	-	-	-	-	246	-
Stage 1	-	-	-	-	601	-
Stage 2	-	-	-	-	563	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.1	72.6
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	394	-	-	979	-
HCM Lane V/C Ratio	0.977	-	-	0.091	-
HCM Control Delay (s)	72.6	-	-	9	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	11.5	-	-	0.3	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	330	478	221	3	35	189
Future Volume (vph)	330	478	221	3	35	189
Ideal Flow (vphpl)	1650	1650	1650	1650	1765	1765
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.998		0.886	
Flt Protected		0.980			0.992	
Satd. Flow (prot)	0	1585	1647	0	1494	0
Flt Permitted		0.980			0.992	
Satd. Flow (perm)	0	1585	1647	0	1494	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		501.6	92.7		100.6	
Travel Time (s)		36.1	6.7		7.2	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	0%	0%	3%	4%
Adj. Flow (vph)	330	478	221	3	35	189
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	808	224	0	224	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 88.2%		ICU Level of Service E	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	6.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	330	478	221	3	35	189
Future Vol, veh/h	330	478	221	3	35	189
Conflicting Peds, #/hr	5	0	0	5	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	0	0	3	4
Mvmt Flow	330	478	221	3	35	189

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	229	0	-	0	1366	228
Stage 1	-	-	-	-	228	-
Stage 2	-	-	-	-	1138	-
Critical Hdwy	4.12	-	-	-	6.43	6.24
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.218	-	-	-	3.527	3.336
Pot Cap-1 Maneuver	1339	-	-	-	161	806
Stage 1	-	-	-	-	808	-
Stage 2	-	-	-	-	304	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1333	-	-	-	106	803
Mov Cap-2 Maneuver	-	-	-	-	106	-
Stage 1	-	-	-	-	533	-
Stage 2	-	-	-	-	303	-

Approach	EB	WB	SB
HCM Control Delay, s	3.5	0	25.3
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1333	-	-	-	396
HCM Lane V/C Ratio	0.248	-	-	-	0.566
HCM Control Delay (s)	8.6	0	-	-	25.3
HCM Lane LOS	A	A	-	-	D
HCM 95th %tile Q(veh)	1	-	-	-	3.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	146	122	255	3	135	113	42	256	2	14	223	71
Future Volume (vph)	146	122	255	3	135	113	42	256	2	14	223	71
Ideal Flow (vphpl)	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550
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		0.934			0.939			0.999			0.969	
Flt Protected		0.986			0.999			0.993			0.998	
Satd. Flow (prot)	0	1382	0	0	1441	0	0	1475	0	0	1457	0
Flt Permitted		0.986			0.999			0.993			0.998	
Satd. Flow (perm)	0	1382	0	0	1441	0	0	1475	0	0	1457	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		72.9			55.4			112.0			136.8	
Travel Time (s)		5.2			4.0			8.1			9.8	
Confl. Peds. (#/hr)			1	1			2		2	2		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	0%	5%	0%	0%	2%	0%	5%	0%	0%	4%	0%
Adj. Flow (vph)	146	122	255	3	135	113	42	256	2	14	223	71
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	523	0	0	251	0	0	300	0	0	308	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 101.0%		ICU Level of Service G	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	39.7
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	146	122	255	3	135	113	42	256	2	14	223	71
Future Vol, veh/h	146	122	255	3	135	113	42	256	2	14	223	71
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	3	0	5	0	0	2	0	5	0	0	4	0
Mvmt Flow	146	122	255	3	135	113	42	256	2	14	223	71
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	67.6	19.1	24.4	24.2
HCM LOS	F	C	C	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	14%	28%	1%	5%
Vol Thru, %	85%	23%	54%	72%
Vol Right, %	1%	49%	45%	23%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	300	523	251	308
LT Vol	42	146	3	14
Through Vol	256	122	135	223
RT Vol	2	255	113	71
Lane Flow Rate	300	523	251	308
Geometry Grp	1	1	1	1
Degree of Util (X)	0.65	1.007	0.531	0.654
Departure Headway (Hd)	7.805	6.932	7.62	7.64
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	462	528	472	471
Service Time	5.889	4.932	5.706	5.722
HCM Lane V/C Ratio	0.649	0.991	0.532	0.654
HCM Control Delay	24.4	67.6	19.1	24.2
HCM Lane LOS	C	F	C	C
HCM 95th-tile Q	4.5	14.2	3.1	4.6

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	748	350	39	700	141	13
Future Volume (vph)	748	350	39	700	141	13
Ideal Flow (vphpl)	1900	1750	1775	1900	1765	1765
Storage Length (m)		70.0	30.0		0.0	0.0
Storage Lanes		1	1		1	0
Taper Length (m)			85.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.989	
Flt Protected			0.950		0.956	
Satd. Flow (prot)	1881	1458	1686	1863	1624	0
Flt Permitted			0.950		0.956	
Satd. Flow (perm)	1881	1458	1686	1863	1624	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	198.8			217.2	70.9	
Travel Time (s)	14.3			15.6	5.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	0%	2%	3%	0%
Adj. Flow (vph)	748	350	39	700	141	13
Shared Lane Traffic (%)						
Lane Group Flow (vph)	748	350	39	700	154	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 55.3%		ICU Level of Service B	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	16.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	748	350	39	700	141	13
Future Vol, veh/h	748	350	39	700	141	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	700	300	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	1	2	0	2	3	0
Mvmt Flow	748	350	39	700	141	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1098	0	1526	748
Stage 1	-	-	-	-	748	-
Stage 2	-	-	-	-	778	-
Critical Hdwy	-	-	4.1	-	6.43	6.2
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.2	-	3.527	3.3
Pot Cap-1 Maneuver	-	-	643	-	~ 129	416
Stage 1	-	-	-	-	466	-
Stage 2	-	-	-	-	451	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	643	-	~ 121	416
Mov Cap-2 Maneuver	-	-	-	-	~ 121	-
Stage 1	-	-	-	-	466	-
Stage 2	-	-	-	-	423	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	206.5
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	129	-	-	643	-
HCM Lane V/C Ratio	1.194	-	-	0.061	-
HCM Control Delay (s)	206.5	-	-	11	-
HCM Lane LOS	F	-	-	B	-
HCM 95th %tile Q(veh)	9.3	-	-	0.2	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	83	29	43	77	203	162
Future Volume (vph)	83	29	43	77	203	162
Ideal Flow (vphpl)	1765	1765	1650	1650	1650	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.965				0.940	
Flt Protected	0.964			0.982		
Satd. Flow (prot)	1642	0	0	1460	1516	0
Flt Permitted	0.964			0.982		
Satd. Flow (perm)	1642	0	0	1460	1516	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	148.9			459.2	116.3	
Travel Time (s)	10.7			33.1	8.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	27%	2%	1%	4%
Adj. Flow (vph)	83	29	43	77	203	162
Shared Lane Traffic (%)						
Lane Group Flow (vph)	112	0	0	120	365	0
Sign Control	Stop			Free	Free	

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

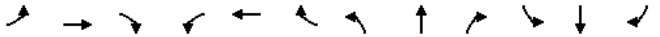
Intersection	
Int Delay, s/veh	3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	83	29	43	77	203	162
Future Vol, veh/h	83	29	43	77	203	162
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	27	2	1	4
Mvmt Flow	83	29	43	77	203	162

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	447	284	365	0	-	0
Stage 1	284	-	-	-	-	-
Stage 2	163	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.37	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.443	-	-	-
Pot Cap-1 Maneuver	573	760	1068	-	-	-
Stage 1	769	-	-	-	-	-
Stage 2	871	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	549	760	1068	-	-	-
Mov Cap-2 Maneuver	549	-	-	-	-	-
Stage 1	737	-	-	-	-	-
Stage 2	871	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.5	3.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1068	-	592	-	-
HCM Lane V/C Ratio	0.04	-	0.189	-	-
HCM Control Delay (s)	8.5	0	12.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.7	-	-



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	26	9	95	11	45	15	123	84	3	18	159	45
Future Volume (vph)	26	9	95	11	45	15	123	84	3	18	159	45
Ideal Flow (vphpl)	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550
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		0.901			0.971			0.998			0.973	
Flt Protected		0.990			0.992			0.972			0.996	
Satd. Flow (prot)	0	1363	0	0	1493	0	0	1495	0	0	1481	0
Flt Permitted		0.990			0.992			0.972			0.996	
Satd. Flow (perm)	0	1363	0	0	1493	0	0	1495	0	0	1481	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		242.7			135.8			104.7			319.1	
Travel Time (s)		17.5			9.8			7.5			23.0	
Confl. Peds. (#/hr)	3		1	1		3	5					5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	1%	0%	0%	0%	2%	0%
Adj. Flow (vph)	26	9	95	11	45	15	123	84	3	18	159	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	130	0	0	71	0	0	210	0	0	222	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 52.9%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	26	9	95	11	45	15	123	84	3	18	159	45
Future Vol, veh/h	26	9	95	11	45	15	123	84	3	18	159	45
Conflicting Peds, #/hr	3	0	1	1	0	3	5	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	2	0	0	0	1	0	0	0	2	0
Mvmt Flow	26	9	95	11	45	15	123	84	3	18	159	45

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	588	556	188	603	577	89	209	0	0	87	0	0
Stage 1	223	223	-	332	332	-	-	-	-	-	-	-
Stage 2	365	333	-	271	245	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.22	7.1	6.5	6.2	4.11	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.318	3.5	4	3.3	2.209	-	-	2.2	-	-
Pot Cap-1 Maneuver	423	442	854	414	430	975	1368	-	-	1522	-	-
Stage 1	784	723	-	686	648	-	-	-	-	-	-	-
Stage 2	658	647	-	739	707	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	346	393	850	332	383	973	1362	-	-	1522	-	-
Mov Cap-2 Maneuver	346	393	-	332	383	-	-	-	-	-	-	-
Stage 1	706	711	-	621	586	-	-	-	-	-	-	-
Stage 2	540	586	-	639	695	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.3	15.1	4.6	0.6
HCM LOS	B	C		

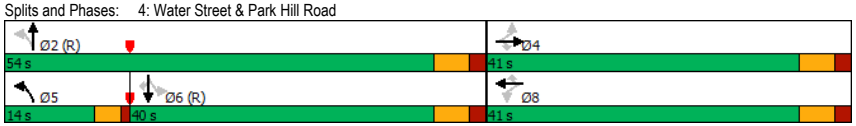
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1362	-	-	620	428	1522	-	-
HCM Lane V/C Ratio	0.09	-	-	0.21	0.166	0.012	-	-
HCM Control Delay (s)	7.9	0	-	12.3	15.1	7.4	0	-
HCM Lane LOS	A	A	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0.8	0.6	0	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	812	162	9	443	10	233	184	49	12	650	918
Future Volume (vph)	29	812	162	9	443	10	233	184	49	12	650	918
Ideal Flow (vphpl)	1775	1775	1750	1775	1650	1650	1775	1650	1650	1775	1900	1750
Storage Length (m)	0.0		10.0	0.0		15.0	22.0		0.0	38.0		0.0
Storage Lanes	0		1	0		1	1		0	1		1
Taper Length (m)	7.5			7.5			20.0			50.0		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.968				0.850
Flt Protected		0.998			0.999		0.950			0.950		
Satd. Flow (prot)	0	3334	1473	0	1632	1402	1670	1585	0	1686	1863	1473
Flt Permitted		0.895			0.980		0.105			0.613		
Satd. Flow (perm)	0	2990	1473	0	1601	1402	185	1585	0	1088	1863	1473
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			80			80		21				225
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		179.1			108.9			140.9			142.0	
Travel Time (s)		12.9			7.8			10.1			10.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	1%	1%	0%	0%	2%	1%
Adj. Flow (vph)	29	812	162	9	443	10	233	184	49	12	650	918
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	841	162	0	452	10	233	233	0	12	650	918
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8		8	2			6		6
Detector Phase	4	4	4	8	8	8	5	2		6	6	6
Switch Phase												
Minimum Initial (s)	24.4	24.4	24.4	24.4	24.4	24.4	5.0	32.4		31.0	31.0	31.0
Minimum Split (s)	30.4	30.4	30.4	30.4	30.4	30.4	9.0	38.4		37.0	37.0	37.0
Total Split (s)	41.0	41.0	41.0	41.0	41.0	41.0	14.0	54.0		40.0	40.0	40.0
Total Split (%)	43.2%	43.2%	43.2%	43.2%	43.2%	43.2%	14.7%	56.8%		42.1%	42.1%	42.1%
Maximum Green (s)	35.0	35.0	35.0	35.0	35.0	35.0	10.0	48.0		34.0	34.0	34.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0		-2.0	0.0	0.0	-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)		4.0	4.0		4.0	6.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max	Max	Max	None	C-Max		C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0		11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0		0		0	0	0
Act Effct Green (s)		37.0	37.0		37.0	35.0	50.0	50.0		36.0	36.0	36.0
Actuated g/C Ratio		0.39	0.39		0.39	0.37	0.53	0.53		0.38	0.38	0.38
v/c Ratio		0.72	0.26		0.73	0.02	0.92	0.28		0.03	0.92	1.32
Control Delay		29.0	11.4		32.8	0.1	61.8	12.3		18.9	49.0	175.2
Queue Delay		0.0	0.0		18.8	0.0	0.0	0.0		0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		29.0	11.4		51.6	0.1	61.8	12.3		18.9	49.0	175.2
LOS		C	B		D	A	E	B		B	D	F
Approach Delay		26.1			50.5			37.1			122.1	
Approach LOS		C			D			D			F	
Queue Length 50th (m)		71.1	10.0		72.9	0.0	28.4	21.2		1.4	117.7	~202.7
Queue Length 95th (m)		94.5	24.3		110.9	0.0	#74.3	36.1		5.2	#187.8	#279.2
Internal Link Dist (m)		155.1			84.9			116.9			118.0	
Turn Bay Length (m)			10.0			15.0	22.0			38.0		
Base Capacity (vph)		1164	622		623	567	253	844		412	705	697
Starvation Cap Reductn		0	0		167	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		0.72	0.26		0.99	0.02	0.92	0.28		0.03	0.92	1.32

Intersection Summary			
Area Type:	Other		
Cycle Length: 95			
Actuated Cycle Length: 95			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.32			
Intersection Signal Delay: 74.0		Intersection LOS: E	
Intersection Capacity Utilization 113.0%		ICU Level of Service H	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 4: Water Street & Park Hill Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	812	162	9	443	10	233	184	49	12	650	918
Future Volume (veh/h)	29	812	162	9	443	10	233	184	49	12	650	918
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1775	1761	1736	1775	1637	1650	1761	1637	1650	1775	1870	1736
Adj Flow Rate, veh/h	29	812	162	9	443	10	233	184	49	12	650	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	1	1	0	1	0	1	1	0	0	2	1
Cap, veh/h	43	897	573	40	487	515	272	656	175	490	711	
Arrive On Green	0.37	0.39	0.39	0.39	0.39	0.37	0.10	0.53	0.51	0.38	0.38	0.00
Sat Flow, veh/h	4	2304	1471	4	1250	1398	1677	1246	332	1089	1870	1471
Grp Volume(v), veh/h	289	552	162	452	0	10	233	0	233	12	650	0
Grp Sat Flow(s),veh/h/ln	785	1523	1471	1254	0	1398	1677	0	1577	1089	1870	1471
Q Serve(g_s), s	0.8	33.0	7.2	3.4	0.0	0.4	7.9	0.0	7.9	0.7	31.4	0.0
Cycle Q Clear(g_c), s	35.0	33.0	7.2	35.4	0.0	0.4	7.9	0.0	7.9	0.7	31.4	0.0
Prop In Lane	0.10		1.00	0.02		1.00	1.00		0.21	1.00		1.00
Lane Grp Cap(c), veh/h	331	593	573	527	0	515	272	0	830	490	711	
V/C Ratio(X)	0.87	0.93	0.28	0.86	0.00	0.02	0.86	0.00	0.28	0.02	0.91	
Avail Cap(c_a), veh/h	331	593	573	527	0	515	274	0	830	490	711	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.36	0.00	0.36	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	25.8	27.8	19.9	25.0	0.0	19.1	21.4	0.0	12.6	18.5	28.0	0.0
Incr Delay (d2), s/veh	25.7	23.4	1.2	6.7	0.0	0.0	22.6	0.0	0.8	0.1	18.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	8.6	1.2	4.4	0.0	0.1	2.5	0.0	0.7	0.1	9.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.5	51.2	21.1	31.7	0.0	19.1	44.0	0.0	13.5	18.6	46.3	0.0
LnGrp LOS	D	D	C	C	A	B	D	A	B	B	D	
Approach Vol, veh/h		1003			462			466			662	A
Approach Delay, s/veh		46.4			31.4			28.8			45.8	
Approach LOS		D			C			C			D	
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		54.0		41.0	13.9	40.1		41.0				
Change Period (Y+Rc), s		6.0		6.0	4.0	6.0		6.0				
Max Green Setting (Gmax), s		48.0		35.0	10.0	34.0		35.0				
Max Q Clear Time (g_c+I1), s		9.9		37.0	9.9	33.4		37.4				
Green Ext Time (p_c), s		1.8		0.0	0.0	0.3		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			40.4									
HCM 6th LOS			D									

Notes

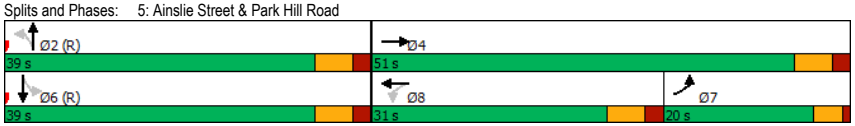
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	477	325	50	29	405	23	43	611	14	10	403	32
Future Volume (vph)	477	325	50	29	405	23	43	611	14	10	403	32
Ideal Flow (vphpl)	1775	1650	1650	1650	1650	1650	1775	1650	1650	1550	1550	1550
Storage Length (m)	50.0		0.0	0.0		0.0	30.0		0.0	10.0		0.0
Storage Lanes	2		0	1		0	0		0	0		0
Taper Length (m)	15.0			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.99	0.99		0.99	1.00			1.00			1.00	
Frt		0.980			0.992			0.997			0.990	
Flt Protected	0.950			0.950				0.997			0.999	
Satd. Flow (prot)	3239	1586	0	1568	1620	0	0	2893	0	0	1484	0
Flt Permitted	0.950			0.381				0.891			0.982	
Satd. Flow (perm)	3212	1586	0	622	1620	0	0	2584	0	0	1459	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			3			3			5	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		108.9			106.9			99.2			139.1	
Travel Time (s)		7.8			7.7			7.1			10.0	
Confl. Peds. (#/hr)	6		9	9		6	12		7	7		12
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	4%	0%	1%	0%	5%	8%	0%	0%	3%	3%
Adj. Flow (vph)	477	325	50	29	405	23	43	611	14	10	403	32
Shared Lane Traffic (%)												
Lane Group Flow (vph)	477	375	0	29	428	0	0	668	0	0	445	0
Turn Type	Prot	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Detector Phase	7	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	22.8		22.8	22.8		30.8	30.8		30.8	30.8	
Minimum Split (s)	9.0	28.8		28.8	28.8		36.8	36.8		36.8	36.8	
Total Split (s)	20.0	51.0		31.0	31.0		39.0	39.0		39.0	39.0	
Total Split (%)	22.2%	56.7%		34.4%	34.4%		43.3%	43.3%		43.3%	43.3%	
Maximum Green (s)	16.0	45.0		25.0	25.0		33.0	33.0		33.0	33.0	
Yellow Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	-2.0		0.0	-2.0			-2.0			-2.0	
Total Lost Time (s)	4.0	4.0		6.0	4.0			4.0			4.0	
Lead/Lag	Lag			Lead	Lead							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	16.0	47.0		25.0	27.0			35.0			35.0	
Actuated g/C Ratio	0.18	0.52		0.28	0.30			0.39			0.39	
v/c Ratio	0.83	0.45		0.17	0.88			0.66			0.78	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	49.6	15.1		27.8	50.8			26.5			35.3	
Queue Delay	0.0	2.1		0.0	0.0			0.0			0.0	
Total Delay	49.6	17.1		27.8	50.8			26.5			35.3	
LOS	D	B		C	D			C			D	
Approach Delay		35.3			49.3			26.5			35.3	
Approach LOS		D			D			C			D	
Queue Length 50th (m)	43.5	38.8		4.0	73.2			51.3			68.9	
Queue Length 95th (m)	#68.2	61.4		11.5	#128.5			71.4			#119.3	
Internal Link Dist (m)		84.9			82.9			75.2			115.1	
Turn Bay Length (m)	50.0											
Base Capacity (vph)	575	834		172	488			1006			570	
Starvation Cap Reductn	0	313		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.83	0.72		0.17	0.88			0.66			0.78	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 35.5		Intersection LOS: D	
Intersection Capacity Utilization 95.3%		ICU Level of Service F	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 5: Ainslie Street & Park Hill Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	477	325	50	29	405	23	43	611	14	10	403	32
Future Volume (veh/h)	477	325	50	29	405	23	43	611	14	10	403	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1761	1637	1599	1650	1637	1650	1706	1547	1650	1550	1514	1514
Adj Flow Rate, veh/h	477	325	50	29	405	23	43	611	14	10	403	32
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	1	1	4	0	1	0	5	8	0	0	3	3
Cap, veh/h	548	741	114	199	460	26	162	2138	49	50	1118	87
Arrive On Green	0.17	0.54	0.51	0.28	0.30	0.28	0.80	0.82	0.80	0.80	0.82	0.80
Sat Flow, veh/h	3254	1384	213	886	1533	87	142	2605	59	11	1362	106
Grp Volume(v), veh/h	477	0	375	29	0	428	338	0	330	445	0	0
Grp Sat Flow(s),veh/h/ln	1627	0	1597	886	0	1620	1410	0	1397	1479	0	0
Q Serve(g_s), s	12.9	0.0	12.9	2.6	0.0	22.6	0.0	0.0	5.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	12.9	0.0	12.9	15.5	0.0	22.6	4.6	0.0	5.0	7.0	0.0	0.0
Prop In Lane	1.00		0.13	1.00		0.05	0.13		0.04	0.02		0.07
Lane Grp Cap(c), veh/h	548	0	855	199	0	486	1171	0	1146	1222	0	0
V/C Ratio(X)	0.87	0.00	0.44	0.15	0.00	0.88	0.29	0.00	0.29	0.36	0.00	0.00
Avail Cap(c_a), veh/h	578	0	855	199	0	486	1171	0	1146	1222	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.63	0.00	0.63	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	36.5	0.0	12.8	34.9	0.0	30.0	1.9	0.0	1.9	2.1	0.0	0.0
Incr Delay (d2), s/veh	8.7	0.0	1.0	1.5	0.0	19.9	0.6	0.0	0.6	0.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	0.8	0.4	0.0	6.7	0.2	0.0	0.2	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.2	0.0	13.8	36.4	0.0	49.9	2.5	0.0	2.5	2.9	0.0	0.0
LnGrp LOS	D	A	B	D	A	D	A	A	A	A	A	A
Approach Vol, veh/h		852			457			668			445	
Approach Delay, s/veh		31.4			49.1			2.5			2.9	
Approach LOS		C			D			A			A	
Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		79.0		52.2		79.0	21.2	31.0				
Change Period (Y+Rc), s		6.0		6.0		6.0	6.0	* 6				
Max Green Setting (Gmax), s		33.0		45.0		33.0	16.0	* 25				
Max Q Clear Time (g_c+I1), s		7.0		14.9		9.0	14.9	24.6				
Green Ext Time (p_c), s		5.4		3.0		3.5	0.3	0.1				

Intersection Summary		
HCM 6th Ctrl Delay		21.5
HCM 6th LOS		C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	300	381	22	269	226	23
Future Volume (vph)	300	381	22	269	226	23
Ideal Flow (vphpl)	1650	1650	0	1650	1765	1765
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.924				0.988	
Flt Protected				0.996	0.957	
Satd. Flow (prot)	1446	0	0	1599	1543	0
Flt Permitted				0.996	0.957	
Satd. Flow (perm)	1446	0	0	1599	1543	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	163.9			177.2	162.3	
Travel Time (s)	11.8			12.8	11.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	6%	5%	0%	3%	9%	0%
Adj. Flow (vph)	300	381	22	269	226	23
Shared Lane Traffic (%)						
Lane Group Flow (vph)	681	0	0	291	249	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 66.7%		ICU Level of Service C	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	7.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	300	381	22	269	226	23
Future Vol, veh/h	300	381	22	269	226	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	6	5	0	3	9	0
Mvmt Flow	300	381	22	269	226	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	681	0	804	491
Stage 1	-	-	-	-	491	-
Stage 2	-	-	-	-	313	-
Critical Hdwy	-	-	4.1	-	6.49	6.2
Critical Hdwy Stg 1	-	-	-	-	5.49	-
Critical Hdwy Stg 2	-	-	-	-	5.49	-
Follow-up Hdwy	-	-	2.2	-	3.581	3.3
Pot Cap-1 Maneuver	-	-	921	-	343	582
Stage 1	-	-	-	-	601	-
Stage 2	-	-	-	-	726	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	921	-	333	582
Mov Cap-2 Maneuver	-	-	-	-	333	-
Stage 1	-	-	-	-	601	-
Stage 2	-	-	-	-	706	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	37.8
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	347	-	-	921	-
HCM Lane V/C Ratio	0.718	-	-	0.024	-
HCM Control Delay (s)	37.8	-	-	9	0
HCM Lane LOS	E	-	-	A	A
HCM 95th %tile Q(veh)	5.3	-	-	0.1	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	389	128	267	508	108	154
Future Volume (vph)	389	128	267	508	108	154
Ideal Flow (vphpl)	1650	1650	0	1650	1765	1765
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.967				0.921	
Flt Protected				0.983	0.980	
Satd. Flow (prot)	1596	0	0	1596	1593	0
Flt Permitted				0.983	0.980	
Satd. Flow (perm)	1596	0	0	1596	1593	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	91.2			171.5	132.1	
Travel Time (s)	6.6			12.3	9.5	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	1%	2%	0%	0%
Adj. Flow (vph)	389	128	267	508	108	154
Shared Lane Traffic (%)						
Lane Group Flow (vph)	517	0	0	775	262	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 326.5%		ICU Level of Service H	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	50.9

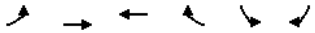
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	389	128	267	508	108	154
Future Vol, veh/h	389	128	267	508	108	154
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	1	2	0	0
Mvmt Flow	389	128	267	508	108	154

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	518	0	1496	454
Stage 1	-	-	-	-	454	-
Stage 2	-	-	-	-	1042	-
Critical Hdwy	-	-	4.11	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.209	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1053	-	137	610
Stage 1	-	-	-	-	644	-
Stage 2	-	-	-	-	343	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1052	-	~ 88	609
Mov Cap-2 Maneuver	-	-	-	-	~ 88	-
Stage 1	-	-	-	-	643	-
Stage 2	-	-	-	-	222	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.3	292.2
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	177	-	-	1052	-
HCM Lane V/C Ratio	1.48	-	-	0.254	-
HCM Control Delay (s)	292.2	-	-	9.6	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	16.6	-	-	1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	227	376	497	14	35	381
Future Volume (vph)	227	376	497	14	35	381
Ideal Flow (vphpl)	1650	1650	1650	1650	1765	1765
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.996		0.876	
Flt Protected		0.982			0.996	
Satd. Flow (prot)	0	1589	1643	0	1482	0
Flt Permitted		0.982			0.996	
Satd. Flow (perm)	0	1589	1643	0	1482	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		501.6	92.7		100.6	
Travel Time (s)		36.1	6.7		7.2	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	0%	0%	3%	4%
Adj. Flow (vph)	227	376	497	14	35	381
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	603	511	0	416	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 105.8%		ICU Level of Service G	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	19.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	227	376	497	14	35	381
Future Vol, veh/h	227	376	497	14	35	381
Conflicting Peds, #/hr	5	0	0	5	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	0	0	3	4
Mvmt Flow	227	376	497	14	35	381

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	516	0	-	0	1339	509
Stage 1	-	-	-	-	509	-
Stage 2	-	-	-	-	830	-
Critical Hdwy	4.12	-	-	-	6.43	6.24
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.218	-	-	-	3.527	3.336
Pot Cap-1 Maneuver	1050	-	-	-	168	560
Stage 1	-	-	-	-	602	-
Stage 2	-	-	-	-	426	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1046	-	-	-	121	558
Mov Cap-2 Maneuver	-	-	-	-	121	-
Stage 1	-	-	-	-	435	-
Stage 2	-	-	-	-	424	-

Approach	EB	WB	SB
HCM Control Delay, s	3.5	0	68.1
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1046	-	-	-	428
HCM Lane V/C Ratio	0.217	-	-	-	0.972
HCM Control Delay (s)	9.4	0	-	-	68.1
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0.8	-	-	-	11.8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	97	196	5	308	131	53	204	5	11	391	157
Future Volume (vph)	110	97	196	5	308	131	53	204	5	11	391	157
Ideal Flow (vphpl)	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550
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		0.934			0.960			0.997			0.962	
Flt Protected		0.987			0.999			0.990			0.999	
Satd. Flow (prot)	0	1422	0	0	1473	0	0	1500	0	0	1490	0
Flt Permitted		0.987			0.999			0.990			0.999	
Satd. Flow (perm)	0	1422	0	0	1473	0	0	1500	0	0	1490	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		72.9			55.4			112.0			136.8	
Travel Time (s)		5.2			4.0			8.1			9.8	
Confl. Peds. (#/hr)	2		3	3		2	4		5	5		4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	1%	0%	0%	3%	2%	2%	0%	0%	0%	0%
Adj. Flow (vph)	110	97	196	5	308	131	53	204	5	11	391	157
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	403	0	0	444	0	0	262	0	0	559	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 120.0%		ICU Level of Service H	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	108.6
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	110	97	196	5	308	131	53	204	5	11	391	157
Future Vol, veh/h	110	97	196	5	308	131	53	204	5	11	391	157
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	0	0	1	0	0	3	2	2	0	0	0	0
Mvmt Flow	110	97	196	5	308	131	53	204	5	11	391	157
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	67.6	89.7	34.5	187.8
HCM LOS	F	F	D	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	20%	27%	1%	2%
Vol Thru, %	78%	24%	69%	70%
Vol Right, %	2%	49%	30%	28%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	262	403	444	559
LT Vol	53	110	5	11
Through Vol	204	97	308	391
RT Vol	5	196	131	157
Lane Flow Rate	262	403	444	559
Geometry Grp	1	1	1	1
Degree of Util (X)	0.691	0.954	1.043	1.325
Departure Headway (Hd)	10.712	9.67	9.505	8.791
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	341	379	386	419
Service Time	8.712	7.67	7.505	6.791
HCM Lane V/C Ratio	0.768	1.063	1.15	1.334
HCM Control Delay	34.5	67.6	89.7	187.8
HCM Lane LOS	D	F	F	F
HCM 95th-tile Q	4.9	10.5	13.2	24.8

Junctions 8

ARCADY 8 - Roundabout Module

Version: 8.0.6.541 [19821,26/11/2015]

Filename: Blenheim & Bismark.arc8
Path: C:\Users\AdamMorrison\Paradigm\Projects - 180312 Westwood\C5 - Analysis and Evaluation\Arcady
Report generation date: 2021-04-22 10:34:42 AM

Summary of intersection performance

	AM					
	Queue (Veh)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS
	A1 - 2030 Background					
Leg North	0.08	4.43	0.08	A	5.02	A
Leg West	0.63	5.04	0.39	A		
Leg South	0.50	5.30	0.33	A		
Leg East	0.36	4.79	0.27	A		

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages.

"D1 - 2030 Background, AM " model duration: 8:00 AM - 9:30 AM
"D2 - 2030 Background, PM" model duration: 4:00 PM - 5:30 PM
"D3 - 2030 Total, AM" model duration: 8:00 AM - 9:30 AM
"D4 - 2030 Total, PM" model duration: 4:00 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2021-04-22 10:34:41 AM

File summary

Title	Blenheim & Bismark / Street H
Location	Cambridge
Site Number	
Date	2016-05-05
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	100210
Analyst	Matt
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	V/C Ratio Threshold	Average Delay Threshold (s)	Queue Threshold (PCE)
7.50	✓		N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	Veh	Veh	perHour	s	-Min	perMin

(Default Analysis Set) - 2030 Background, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set(s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relationship
2030 Background, AM	2030 Background	AM		ONE HOUR	08:00	09:30	90	15				✓		

Intersection Network

Intersections

Intersection	Name	Intersection Type	Leg Order	Grade Separated	Large Roundabout	Do Geometric Delay	Intersection Delay (s)	Intersection LOS
1	(untitled)	Roundabout	North,West,South,East				5.02	A

Intersection Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Bismark Drive SB	
West	West	Blenheim Road EB	
South	South	Street G NB	
East	East	Blenheim Road WB	

Capacity Options

Leg	Minimum Capacity (PCE/hr)	Maximum Capacity (PCE/hr)	Assume Flat Start Profile	Initial Queue (PCE)
North	0.00	99999.00		0.00
West	0.00	99999.00		0.00
South	0.00	99999.00		0.00
East	0.00	99999.00		0.00

Roundabout Geometry

Leg	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
North	3.50	4.50	30.00	20.00	40.00	25.00	
West	3.50	4.50	30.00	20.00	40.00	25.00	
South	3.50	4.50	30.00	20.00	40.00	25.00	
East	3.50	4.50	30.00	20.00	40.00	25.00	

Slope / Intercept / Capacity

Leg Intercept Adjustments

Leg	Type	Reason	Direct Intercept Adjustment (PCE/hr)	Percentage Intercept Adjustment (%)
North	Percentage	Region of Waterloo Requirement		90.00
West	Percentage	Region of Waterloo Requirement		90.00
South	Percentage	Region of Waterloo Requirement		90.00
East	Percentage	Region of Waterloo Requirement		90.00

Roundabout Slope and Intercept used in model

Leg	Enter slope and intercept directly	Entered slope	Entered intercept (PCE/hr)	Final Slope	Final Intercept (PCE/hr)
North		(calculated)	(calculated)	0.579	1221.701
West		(calculated)	(calculated)	0.579	1221.701
South		(calculated)	(calculated)	0.579	1221.701
East		(calculated)	(calculated)	0.579	1221.701

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCE Factor for a Truck (PCE)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	Truck Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Leg	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
North	ONE HOUR	✓	60.00	100.000
West	ONE HOUR	✓	408.00	100.000
South	ONE HOUR	✓	309.00	100.000
East	ONE HOUR	✓	247.00	100.000

Turning Proportions

Turning Counts / Proportions (Veh/hr) - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	0.000	31.000	17.000	12.000
	West	10.000	0.000	139.000	259.000
	South	5.000	258.000	0.000	46.000
	East	4.000	218.000	25.000	0.000

Turning Proportions (Veh) - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	0.00	0.52	0.28	0.20
	West	0.02	0.00	0.34	0.63
	South	0.02	0.83	0.00	0.15
	East	0.02	0.88	0.10	0.00

Vehicle Mix

Average PCE Per Vehicle - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	1.020	1.020	1.020	1.020
	West	1.020	1.020	1.020	1.020
	South	1.020	1.020	1.020	1.020
	East	1.020	1.020	1.020	1.020

Truck Percentages - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	2.0	2.0	2.0	2.0
	West	2.0	2.0	2.0	2.0
	South	2.0	2.0	2.0	2.0
	East	2.0	2.0	2.0	2.0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Intersection Arrivals (Veh)	Total Queueing Delay (Veh-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (Veh-min/min)	Inclusive Total Queueing Delay (Veh-min)	Inclusive Average Queueing Delay (s)
North	0.08	4.43	0.08	~1	A	55.06	82.59	5.69	4.13	0.06	5.69	4.13
West	0.39	5.04	0.63	1.00	A	374.39	561.58	42.84	4.58	0.48	42.84	4.58
South	0.33	5.30	0.50	1.00	A	283.54	425.32	33.80	4.77	0.38	33.81	4.77
East	0.27	4.79	0.36	~1	A	226.65	339.98	24.91	4.40	0.28	24.91	4.40

Main Results for each time segment

Main results: (08:00-08:15)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	45.17	11.29	44.98	14.24	375.45	0.00	980.45	371.05	0.046	0.00	0.05	3.847	A
West	307.16	76.79	305.76	379.95	40.48	0.00	1174.32	1046.46	0.262	0.00	0.35	4.138	A
South	232.63	58.16	231.53	135.65	210.58	0.00	1075.87	755.48	0.216	0.00	0.27	4.258	A
East	185.95	46.49	185.13	237.56	204.56	0.00	1079.35	810.75	0.172	0.00	0.21	4.022	A

Main results: (08:15-08:30)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	53.94	13.48	53.89	17.06	449.89	0.00	937.37	371.07	0.058	0.05	0.06	4.074	A
West	366.78	91.70	366.38	455.28	48.50	0.00	1169.68	1046.46	0.314	0.35	0.45	4.479	A
South	277.78	69.45	277.46	162.54	252.34	0.00	1051.70	755.48	0.264	0.27	0.36	4.647	A
East	222.05	55.51	221.82	284.66	245.13	0.00	1055.87	810.75	0.210	0.21	0.26	4.315	A

Main results: (08:30-08:45)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	66.06	16.52	65.98	20.89	550.77	0.00	878.98	371.06	0.075	0.06	0.08	4.428	A
West	449.22	112.30	448.54	557.37	59.38	0.00	1163.38	1046.46	0.386	0.45	0.62	5.032	A
South	340.22	85.05	339.65	198.99	308.92	0.00	1018.95	755.48	0.334	0.36	0.50	5.295	A
East	271.95	67.99	271.57	348.49	300.08	0.00	1024.07	810.75	0.266	0.26	0.36	4.782	A

Main results: (08:45-09:00)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	66.06	16.52	66.06	20.92	551.60	0.00	878.50	371.06	0.075	0.08	0.08	4.430	A
West	449.22	112.30	449.21	558.20	59.45	0.00	1163.34	1046.46	0.386	0.62	0.63	5.040	A
South	340.22	85.05	340.21	199.28	309.38	0.00	1018.69	755.48	0.334	0.50	0.50	5.305	A
East	271.95	67.99	271.95	349.01	300.57	0.00	1023.79	810.75	0.266	0.36	0.36	4.787	A

Main results: (09:00-09:15)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS

North	53.94	13.48	54.02	17.11	451.21	0.00	936.60	371.07	0.058	0.08	0.06	4.080	A
West	366.78	91.70	367.45	456.61	48.62	0.00	1169.61	1046.46	0.314	0.63	0.46	4.491	A
South	277.78	69.45	278.34	163.00	253.07	0.00	1051.28	755.48	0.264	0.50	0.36	4.662	A
East	222.05	55.51	222.42	285.50	245.91	0.00	1055.43	810.75	0.210	0.36	0.27	4.324	A

Main results: (09:15-09:30)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	45.17	11.29	45.22	14.32	377.69	0.00	979.15	371.05	0.046	0.06	0.05	3.856	A
West	307.16	76.79	307.58	382.21	40.70	0.00	1174.19	1046.46	0.262	0.46	0.36	4.155	A
South	232.63	58.16	232.97	136.45	211.84	0.00	1075.14	755.48	0.216	0.36	0.28	4.276	A
East	185.95	46.49	186.19	238.98	205.82	0.00	1078.62	810.75	0.172	0.27	0.21	4.034	A

Queueing Delay Results for each time segment

Queueing Delay results: (08:00-08:15)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	0.71	0.05	3.847	A	A
West	5.15	0.34	4.138	A	A
South	4.01	0.27	4.258	A	A
East	3.04	0.20	4.022	A	A

Queueing Delay results: (08:15-08:30)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	0.90	0.06	4.074	A	A
West	6.68	0.45	4.479	A	A
South	5.25	0.35	4.647	A	A
East	3.91	0.26	4.315	A	A

Queueing Delay results: (08:30-08:45)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	1.19	0.08	4.428	A	A
West	9.14	0.61	5.032	A	A
South	7.29	0.49	5.295	A	A
East	5.28	0.35	4.782	A	A

Queueing Delay results: (08:45-09:00)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	1.21	0.08	4.430	A	A
West	9.38	0.63	5.040	A	A
South	7.48	0.50	5.305	A	A
East	5.40	0.36	4.787	A	A

Queueing Delay results: (09:00-09:15)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	0.94	0.06	4.080	A	A
West	7.05	0.47	4.491	A	A
South	5.54	0.37	4.662	A	A
East	4.10	0.27	4.324	A	A

Queueing Delay results: (09:15-09:30)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	0.74	0.05	3.856	A	A
West	5.44	0.36	4.155	A	A
South	4.24	0.28	4.276	A	A
East	3.19	0.21	4.034	A	A

Queue Variation Results for each time segment

Queue Variation results: (08:00-08:15)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.05	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.35	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.27	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.21	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (08:15-08:30)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.06	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.45	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.36	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.26	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (08:30-08:45)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.08	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.62	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.50	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.36	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (08:45-09:00)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.08	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.63	0.00	0.00	0.00	1.00			N/A	N/A
South	0.50	0.00	0.00	0.00	1.00			N/A	N/A
East	0.36	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (09:00-09:15)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.06	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.46	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.36	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.27	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (09:15-09:30)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.05	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.36	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.28	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.21	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Junctions 8

ARCADY 8 - Roundabout Module

Version: 8.0.6.541 [19821,26/11/2015]

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Filename: Blenheim & Bismark.arc8
Path: C:\Users\AdamMorrison\Paradigm\Projects - 180312 Westwood\C5 - Analysis and Evaluation\Arcady
Report generation date: 2021-04-22 10:42:05 AM

Summary of intersection performance

	PM					
	Queue (Veh)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS
	A1 - 2030 Background					
Leg North	0.05	4.44	0.05	A	6.03	A
Leg West	1.17	6.91	0.54	A		
Leg South	0.47	5.17	0.32	A		
Leg East	0.57	5.50	0.36	A		

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages.

"D1 - 2030 Background, AM" model duration: 8:00 AM - 9:30 AM
"D2 - 2030 Background, PM " model duration: 4:00 PM - 5:30 PM
"D3 - 2030 Total, AM" model duration: 8:00 AM - 9:30 AM
"D4 - 2030 Total, PM" model duration: 4:00 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2021-04-22 10:42:04 AM

File summary

Title	Blenheim & Bismark / Street H
Location	Cambridge
Site Number	
Date	2016-05-05
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	100210
Analyst	Matt
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	V/C Ratio Threshold	Average Delay Threshold (s)	Queue Threshold (PCE)
7.50	✓		N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	Veh	Veh	perHour	s	-Min	perMin

(Default Analysis Set) - 2030 Background, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set(s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relationship
2030 Background, PM	2030 Background	PM		ONE HOUR	16:00	17:30	90	15				✓		

Intersection Network

Intersections

Intersection	Name	Intersection Type	Leg Order	Grade Separated	Large Roundabout	Do Geometric Delay	Intersection Delay (s)	Intersection LOS
1	(untitled)	Roundabout	North,West,South,East				6.03	A

Intersection Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Bismark Drive SB	
West	West	Blenheim Road EB	
South	South	Street G NB	
East	East	Blenheim Road WB	

Capacity Options

Leg	Minimum Capacity (PCE/hr)	Maximum Capacity (PCE/hr)	Assume Flat Start Profile	Initial Queue (PCE)
North	0.00	99999.00		0.00
West	0.00	99999.00		0.00
South	0.00	99999.00		0.00
East	0.00	99999.00		0.00

Roundabout Geometry

Leg	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
North	3.50	4.50	30.00	20.00	40.00	25.00	
West	3.50	4.50	30.00	20.00	40.00	25.00	
South	3.50	4.50	30.00	20.00	40.00	25.00	
East	3.50	4.50	30.00	20.00	40.00	25.00	

Slope / Intercept / Capacity

Leg Intercept Adjustments

Leg	Type	Reason	Direct Intercept Adjustment (PCE/hr)	Percentage Intercept Adjustment (%)
North	Percentage	Region of Waterloo Requirement		90.00
West	Percentage	Region of Waterloo Requirement		90.00
South	Percentage	Region of Waterloo Requirement		90.00
East	Percentage	Region of Waterloo Requirement		90.00

Roundabout Slope and Intercept used in model

Leg	Enter slope and intercept directly	Entered slope	Entered intercept (PCE/hr)	Final Slope	Final Intercept (PCE/hr)
North		(calculated)	(calculated)	0.579	1221.701
West		(calculated)	(calculated)	0.579	1221.701
South		(calculated)	(calculated)	0.579	1221.701
East		(calculated)	(calculated)	0.579	1221.701

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCE Factor for a Truck (PCE)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	Truck Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Leg	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
North	ONE HOUR	✓	35.00	100.000
West	ONE HOUR	✓	560.00	100.000
South	ONE HOUR	✓	300.00	100.000
East	ONE HOUR	✓	339.00	100.000

Turning Proportions

Turning Counts / Proportions (Veh/hr) - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	0.000	18.000	10.000	7.000
	West	30.000	0.000	298.000	232.000
	South	17.000	220.000	0.000	63.000
	East	11.000	250.000	78.000	0.000

Turning Proportions (Veh) - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	0.00	0.51	0.29	0.20
	West	0.05	0.00	0.53	0.41
	South	0.06	0.73	0.00	0.21
	East	0.03	0.74	0.23	0.00

Vehicle Mix

Average PCE Per Vehicle - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	1.020	1.020	1.020	1.020
	West	1.020	1.020	1.020	1.020
	South	1.020	1.020	1.020	1.020
	East	1.020	1.020	1.020	1.020

Truck Percentages - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	2.0	2.0	2.0	2.0
	West	2.0	2.0	2.0	2.0
	South	2.0	2.0	2.0	2.0
	East	2.0	2.0	2.0	2.0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Intersection Arrivals (Veh)	Total Queueing Delay (Veh-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (Veh-min/min)	Inclusive Total Queueing Delay (Veh-min)	Inclusive Average Queueing Delay (s)
North	0.05	4.44	0.05	~1	A	32.12	48.17	3.33	4.14	0.04	3.33	4.14
West	0.54	6.91	1.17	?	A	513.87	770.80	75.06	5.84	0.83	75.07	5.84
South	0.32	5.17	0.47	1.00	A	275.29	412.93	32.16	4.67	0.36	32.16	4.67
East	0.36	5.50	0.57	1.00	A	311.07	466.61	38.15	4.91	0.42	38.15	4.91

Main Results for each time segment

Main results: (16:00-16:15)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	26.35	6.59	26.24	43.44	410.61	0.00	960.10	395.06	0.027	0.00	0.03	3.855	A
West	421.60	105.40	419.32	365.66	71.18	0.00	1156.55	985.16	0.365	0.00	0.57	4.869	A
South	225.86	56.46	224.81	289.08	201.43	0.00	1081.17	885.26	0.209	0.00	0.26	4.198	A
East	255.22	63.80	253.99	226.18	200.06	0.00	1081.96	762.44	0.236	0.00	0.31	4.342	A

Main results: (16:15-16:30)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	31.46	7.87	31.43	52.07	492.05	0.00	912.97	395.06	0.034	0.03	0.04	4.083	A
West	503.43	125.86	502.61	438.18	85.30	0.00	1148.38	985.16	0.438	0.57	0.77	5.568	A
South	269.69	67.42	269.38	346.48	241.44	0.00	1058.01	885.26	0.255	0.26	0.34	4.561	A
East	304.75	76.19	304.38	271.08	239.74	0.00	1058.99	762.44	0.288	0.31	0.40	4.768	A

Main results: (16:30-16:45)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	38.54	9.63	38.49	63.72	602.34	0.00	849.13	395.06	0.045	0.04	0.05	4.440	A
West	616.57	154.14	615.00	536.41	104.42	0.00	1137.31	985.16	0.542	0.77	1.17	6.871	A
South	330.31	82.58	329.78	423.99	295.43	0.00	1026.76	885.26	0.322	0.34	0.47	5.162	A
East	373.25	93.31	372.59	331.74	293.48	0.00	1027.89	762.44	0.363	0.40	0.56	5.487	A

Main results: (16:45-17:00)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	38.54	9.63	38.54	63.86	603.34	0.00	848.56	395.06	0.045	0.05	0.05	4.443	A
West	616.57	154.14	616.53	537.28	104.59	0.00	1137.21	985.16	0.542	1.17	1.17	6.913	A
South	330.31	82.58	330.30	424.97	296.16	0.00	1026.34	885.26	0.322	0.47	0.47	5.171	A
East	373.25	93.31	373.23	332.49	293.96	0.00	1027.61	762.44	0.363	0.56	0.57	5.500	A

Main results: (17:00-17:15)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS

North	31.46	7.87	31.51	52.27	493.64	0.00	912.05	395.06	0.035	0.05	0.04	4.088	A
West	503.43	125.86	504.97	439.57	85.57	0.00	1148.22	985.16	0.438	1.17	0.79	5.609	A
South	269.69	67.42	270.21	347.99	242.56	0.00	1057.36	885.26	0.255	0.47	0.34	4.576	A
East	304.75	76.19	305.40	272.25	240.51	0.00	1058.55	762.44	0.288	0.57	0.41	4.785	A

Main results: (17:15-17:30)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	26.35	6.59	26.38	43.74	413.17	0.00	958.62	395.06	0.027	0.04	0.03	3.861	A
West	421.60	105.40	422.44	367.92	71.62	0.00	1156.29	985.16	0.365	0.79	0.58	4.910	A
South	225.86	56.46	226.17	291.15	202.92	0.00	1080.31	885.26	0.209	0.34	0.27	4.216	A
East	255.22	63.80	255.60	227.78	201.31	0.00	1081.24	762.44	0.236	0.41	0.31	4.361	A

Queueing Delay Results for each time segment

Queueing Delay results: (16:00-16:15)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	0.41	0.03	3.855	A	A
West	8.27	0.55	4.869	A	A
South	3.84	0.26	4.198	A	A
East	4.49	0.30	4.342	A	A

Queueing Delay results: (16:15-16:30)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	0.53	0.04	4.083	A	A
West	11.29	0.75	5.568	A	A
South	5.01	0.33	4.561	A	A
East	5.90	0.39	4.768	A	A

Queueing Delay results: (16:30-16:45)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	0.70	0.05	4.440	A	A
West	16.85	1.12	6.871	A	A
South	6.90	0.46	5.162	A	A
East	8.27	0.55	5.487	A	A

Queueing Delay results: (16:45-17:00)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	0.71	0.05	4.443	A	A
West	17.56	1.17	6.913	A	A
South	7.08	0.47	5.171	A	A
East	8.50	0.57	5.500	A	A

Queueing Delay results: (17:00-17:15)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	0.55	0.04	4.088	A	A
West	12.20	0.81	5.609	A	A
South	5.28	0.35	4.576	A	A
East	6.24	0.42	4.785	A	A

Queueing Delay results: (17:15-17:30)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	0.43	0.03	3.861	A	A
West	8.89	0.59	4.910	A	A
South	4.06	0.27	4.216	A	A
East	4.75	0.32	4.361	A	A

Queue Variation Results for each time segment

Queue Variation results: (16:00-16:15)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.03	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.57	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.26	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.31	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (16:15-16:30)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.04	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.77	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.34	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.40	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (16:30-16:45)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.05	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	1.17	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.47	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.56	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (16:45-17:00)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.05	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	1.17	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.47	0.00	0.00	0.00	1.00			N/A	N/A
East	0.57	0.00	0.00	0.00	1.00			N/A	N/A

Queue Variation results: (17:00-17:15)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.04	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.79	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.34	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.41	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (17:15-17:30)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.03	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.58	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.27	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.31	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Appendix D

2031 Total Traffic Operations

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	500	128	17	800	362	14
Future Volume (vph)	500	128	17	800	362	14
Ideal Flow (vphpl)	1900	1750	1775	1900	1765	1765
Storage Length (m)		70.0	30.0		0.0	0.0
Storage Lanes		1	1		1	0
Taper Length (m)			85.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.995	
Flt Protected			0.950		0.954	
Satd. Flow (prot)	1863	1377	1492	1863	1659	0
Flt Permitted			0.950		0.954	
Satd. Flow (perm)	1863	1377	1492	1863	1659	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	198.8			217.2	70.9	
Travel Time (s)	14.3			15.6	5.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	8%	13%	2%	1%	0%
Adj. Flow (vph)	500	128	17	800	362	14
Shared Lane Traffic (%)						
Lane Group Flow (vph)	500	128	17	800	376	0
Sign Control	Free			Free	Stop	

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

Intersection	
Int Delay, s/veh	121.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	500	128	17	800	362	14
Future Vol, veh/h	500	128	17	800	362	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	700	300	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	8	13	2	1	0
Mvmt Flow	500	128	17	800	362	14

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	628	0	1334	500
Stage 1	-	-	-	-	500	-
Stage 2	-	-	-	-	834	-
Critical Hdwy	-	-	4.23	-	6.41	6.2
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	-	-	2.317	-	3.509	3.3
Pot Cap-1 Maneuver	-	-	903	-	~ 171	575
Stage 1	-	-	-	-	611	-
Stage 2	-	-	-	-	428	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	903	-	~ 168	575
Mov Cap-2 Maneuver	-	-	-	-	~ 168	-
Stage 1	-	-	-	-	611	-
Stage 2	-	-	-	-	420	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	$ 589.9
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	173	-	-	903	-
HCM Lane V/C Ratio	2.173	-	-	0.019	-
HCM Control Delay (s)	$ 589.9	-	-	9.1	-
HCM Lane LOS	F	-	-	A	-
HCM 95th %tile Q(veh)	30.1	-	-	0.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	217	65	18	143	70	77
Future Volume (vph)	217	65	18	143	70	77
Ideal Flow (vphpl)	1765	1765	1650	1650	1650	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.969				0.929	
Flt Protected	0.963			0.994		
Satd. Flow (prot)	1634	0	0	1550	1412	0
Flt Permitted	0.963			0.994		
Satd. Flow (perm)	1634	0	0	1550	1412	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	148.9			459.2	116.3	
Travel Time (s)	10.7			33.1	8.4	
Confl. Peds. (#/hr)			2			2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	0%	44%	1%	8%	9%
Adj. Flow (vph)	217	65	18	143	70	77
Shared Lane Traffic (%)						
Lane Group Flow (vph)	282	0	0	161	147	0
Sign Control	Stop			Free	Free	

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

Intersection	
Int Delay, s/veh	6.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	217	65	18	143	70	77
Future Vol, veh/h	217	65	18	143	70	77
Conflicting Peds, #/hr	0	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	1	0	44	1	8	9
Mvmt Flow	217	65	18	143	70	77

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	290	111	149	0	-	0
Stage 1	111	-	-	-	-	-
Stage 2	179	-	-	-	-	-
Critical Hdwy	6.41	6.2	4.54	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.3	2.596	-	-	-
Pot Cap-1 Maneuver	703	948	1212	-	-	-
Stage 1	916	-	-	-	-	-
Stage 2	854	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	689	946	1210	-	-	-
Mov Cap-2 Maneuver	689	-	-	-	-	-
Stage 1	900	-	-	-	-	-
Stage 2	852	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.9	0.9	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1210	-	735	-	-
HCM Lane V/C Ratio	0.015	-	0.384	-	-
HCM Control Delay (s)	8	0	12.9	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	1.8	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	21	191	4	29	14	119	54	6	13	130	19
Future Volume (vph)	52	21	191	4	29	14	119	54	6	13	130	19
Ideal Flow (vphpl)	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550
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		0.902			0.960			0.995			0.984	
Flt Protected		0.990			0.996			0.968			0.996	
Satd. Flow (prot)	0	1295	0	0	1413	0	0	1397	0	0	1460	0
Flt Permitted		0.990			0.996			0.968			0.996	
Satd. Flow (perm)	0	1295	0	0	1413	0	0	1397	0	0	1460	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		242.7			135.8			104.7			319.1	
Travel Time (s)		17.5			9.8			7.5			23.0	
Confl. Peds. (#/hr)	26					26	28					28
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	11%	5%	6%	0%	4%	8%	8%	5%	0%	0%	5%	0%
Adj. Flow (vph)	52	21	191	4	29	14	119	54	6	13	130	19
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	264	0	0	47	0	0	179	0	0	162	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 60.4%		ICU Level of Service B	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	8.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	52	21	191	4	29	14	119	54	6	13	130	19
Future Vol, veh/h	52	21	191	4	29	14	119	54	6	13	130	19
Conflicting Peds, #/hr	26	0	0	0	0	26	28	0	0	0	0	28
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	11	5	6	0	4	8	8	5	0	0	5	0
Mvmt Flow	52	21	191	4	29	14	119	54	6	13	130	19

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	537	492	168	567	498	83	177	0	0	60	0	0
Stage 1	194	194	-	295	295	-	-	-	-	-	-	-
Stage 2	343	298	-	272	203	-	-	-	-	-	-	-
Critical Hdwy	7.21	6.55	6.26	7.1	6.54	6.28	4.18	-	-	4.1	-	-
Critical Hdwy Stg 1	6.21	5.55	-	6.1	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.21	5.55	-	6.1	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.599	4.045	3.354	3.5	4.036	3.372	2.272	-	-	2.2	-	-
Pot Cap-1 Maneuver	441	473	866	437	471	960	1364	-	-	1556	-	-
Stage 1	787	734	-	718	665	-	-	-	-	-	-	-
Stage 2	654	662	-	738	730	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	363	415	845	300	414	939	1332	-	-	1556	-	-
Mov Cap-2 Maneuver	363	415	-	300	414	-	-	-	-	-	-	-
Stage 1	697	710	-	652	604	-	-	-	-	-	-	-
Stage 2	545	601	-	549	706	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.8	13.4	5.3	0.6
HCM LOS	B	B		

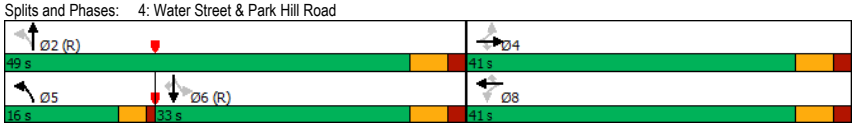
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1332	-	-	629	478	1556	-	-
HCM Lane V/C Ratio	0.089	-	-	0.42	0.098	0.008	-	-
HCM Control Delay (s)	8	0	-	14.8	13.4	7.3	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.3	-	-	2.1	0.3	0	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	1145	136	3	259	2	240	206	38	7	378	451
Future Volume (vph)	2	1145	136	3	259	2	240	206	38	7	378	451
Ideal Flow (vphpl)	1775	1775	1750	1775	1650	1650	1775	1650	1650	1775	1900	1750
Storage Length (m)	0.0		10.0	0.0		15.0	22.0		0.0	38.0		0.0
Storage Lanes	0		1	0		1	1		0	1		1
Taper Length (m)	7.5			7.5			20.0			50.0		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00	0.97			0.97	0.99	1.00		1.00		0.97
Frt			0.850			0.850		0.977				0.850
Flt Protected					0.999		0.950			0.950		
Satd. Flow (prot)	0	3339	1473	0	1601	1402	1670	1522	0	1686	1610	1458
Flt Permitted		0.955			0.988		0.267			0.607		
Satd. Flow (perm)	0	3189	1429	0	1583	1354	467	1522	0	1076	1610	1417
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			85			85		15				421
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		179.1			108.9			140.9			142.0	
Travel Time (s)		12.9			7.8			10.1			10.2	
Confl. Peds. (#/hr)	6		4	4		6	11		1	1		11
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	1%	0%	3%	0%	1%	6%	3%	0%	18%	2%
Adj. Flow (vph)	2	1145	136	3	259	2	240	206	38	7	378	451
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1147	136	0	262	2	240	244	0	7	378	451
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8		8	2			6		6
Detector Phase	4	4	4	8	8	8	5	2		6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	9.5	24.0		24.0	24.0	24.0
Total Split (s)	41.0	41.0	41.0	41.0	41.0	41.0	16.0	49.0		33.0	33.0	33.0
Total Split (%)	45.6%	45.6%	45.6%	45.6%	45.6%	45.6%	17.8%	54.4%		36.7%	36.7%	36.7%
Maximum Green (s)	35.0	35.0	35.0	35.0	35.0	35.0	12.0	43.0		27.0	27.0	27.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0		-2.0	0.0	0.0	-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)		4.0	4.0		4.0	6.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max	Max	Max	None	C-Max		C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0		11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0		0		0	0	0
Act Effct Green (s)		37.0	37.0		37.0	35.0	45.0	45.0		29.8	29.8	29.8
Actuated g/C Ratio		0.41	0.41		0.41	0.39	0.50	0.50		0.33	0.33	0.33
v/c Ratio		0.87	0.21		0.40	0.00	0.63	0.32		0.02	0.71	0.60

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay		33.5	8.2		4.1	0.0	21.1	13.9		21.1	35.4	7.2
Queue Delay		2.4	0.0		0.2	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay		35.9	8.2		4.3	0.0	21.1	13.9		21.1	35.4	7.2
LOS		D	A		A	A	C	B		C	D	A
Approach Delay		33.0			4.3			17.5			20.1	
Approach LOS		C			A			B			C	
Queue Length 50th (m)		98.5	5.5		7.1	0.0	24.3	23.4		0.9	60.5	3.8
Queue Length 95th (m)		#139.5	17.0		9.6	m0.0	40.0	39.8		4.0	#95.4	29.6
Internal Link Dist (m)		155.1			84.9			116.9			118.0	
Turn Bay Length (m)			10.0			15.0	22.0			38.0		
Base Capacity (vph)		1311	637		650	578	393	768		356	533	750
Starvation Cap Reductn		0	0		60	0	0	0		0	0	0
Spillback Cap Reductn		80	0		0	0	0	19		0	0	0
Storage Cap Reductn		0	0		0	0	0	0		0	0	0
Reduced v/c Ratio		0.93	0.21		0.44	0.00	0.61	0.33		0.02	0.71	0.60

Intersection Summary		
Area Type:	Other	
Cycle Length: 90		
Actuated Cycle Length: 90		
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green		
Natural Cycle: 70		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.87		
Intersection Signal Delay: 24.0	Intersection LOS: C	
Intersection Capacity Utilization 79.5%	ICU Level of Service D	
Analysis Period (min) 15		
# 95th percentile volume exceeds capacity, queue may be longer.		
Queue shown is maximum after two cycles.		
m Volume for 95th percentile queue is metered by upstream signal.		

Splits and Phases: 4: Water Street & Park Hill Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	1145	136	3	259	2	240	206	38	7	378	451
Future Volume (veh/h)	2	1145	136	3	259	2	240	206	38	7	378	451
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1775	1761	1736	1775	1611	1650	1761	1573	1611	1775	1633	1723
Adj Flow Rate, veh/h	2	1145	136	3	259	2	240	206	38	7	378	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	1	1	0	3	0	1	6	3	0	18	2
Cap, veh/h	40	1349	601	42	655	540	386	644	119	443	556	
Arrive On Green	0.39	0.41	0.41	0.14	0.14	0.13	0.11	0.50	0.48	0.34	0.34	0.00
Sat Flow, veh/h	1	3282	1461	4	1594	1388	1677	1289	238	1066	1633	1460
Grp Volume(v), veh/h	615	532	136	262	0	2	240	0	244	7	378	0
Grp Sat Flow(s),veh/h/ln	1761	1523	1461	1598	0	1388	1677	0	1527	1066	1633	1460
Q Serve(g_s), s	0.0	28.5	5.4	0.0	0.0	0.1	8.2	0.0	8.6	0.4	17.9	0.0
Cycle Q Clear(g_c), s	29.3	28.5	5.4	13.4	0.0	0.1	8.2	0.0	8.6	0.4	17.9	0.0
Prop In Lane	0.00		1.00	0.01		1.00	1.00		0.16	1.00		1.00
Lane Grp Cap(c), veh/h	725	626	601	697	0	540	386	0	763	443	556	
V/C Ratio(X)	0.85	0.85	0.23	0.38	0.00	0.00	0.62	0.00	0.32	0.02	0.68	
Avail Cap(c_a), veh/h	725	626	601	697	0	540	417	0	763	443	556	
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.82	0.00	0.82	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.3	24.0	17.2	28.7	0.0	24.0	18.5	0.0	13.5	19.7	25.5	0.0
Incr Delay (d2), s/veh	11.9	13.5	0.9	1.3	0.0	0.0	2.5	0.0	1.1	0.1	6.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	5.7	0.8	2.3	0.0	0.0	1.1	0.0	0.8	0.0	3.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.1	37.5	18.1	29.9	0.0	24.0	21.0	0.0	14.6	19.8	32.0	0.0
LnGrp LOS	D	D	B	C	A	C	C	A	B	B	C	
Approach Vol, veh/h		1283			264			484			385	A
Approach Delay, s/veh		34.8			29.9			17.8			31.8	
Approach LOS		C			C			B			C	
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		49.0		41.0	14.3	34.7		41.0				
Change Period (Y+Rc), s		6.0		6.0	4.0	6.0		6.0				
Max Green Setting (Gmax), s		43.0		35.0	12.0	27.0		35.0				
Max Q Clear Time (g_c+I1), s		10.6		31.3	10.2	19.9		15.4				
Green Ext Time (p_c), s		1.8		2.7	0.2	1.5		1.7				
Intersection Summary												
HCM 6th Ctrl Delay			30.4									
HCM 6th LOS			C									

Notes

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

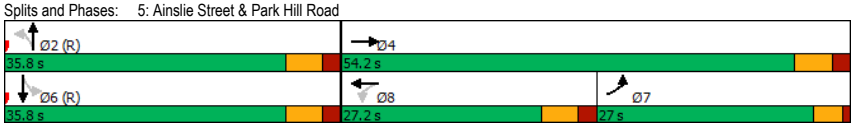
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	754	414	32	12	222	7	28	603	11	7	194	7
Future Volume (vph)	754	414	32	12	222	7	28	603	11	7	194	7
Ideal Flow (vphpl)	1775	1650	1650	1650	1650	1650	1775	1650	1650	1550	1550	1550
Storage Length (m)	50.0		0.0	0.0		0.0	30.0		0.0	10.0		0.0
Storage Lanes	2		0	1		0	0		0	0		0
Taper Length (m)	15.0			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.99	1.00		1.00	1.00			1.00			1.00	
Frt		0.989			0.995			0.997			0.995	
Flt Protected	0.950			0.950				0.998			0.998	
Satd. Flow (prot)	3239	1606	0	1568	1609	0	0	2914	0	0	1360	0
Flt Permitted	0.950			0.288				0.934			0.977	
Satd. Flow (perm)	3198	1606	0	474	1609	0	0	2726	0	0	1331	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			2			2			2	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		108.9			106.9			99.2			139.1	
Travel Time (s)		7.8			7.7			7.1			10.0	
Confl. Peds. (#/hr)	7		3	3		7	5		18	18		5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	7%	0%	2%	0%	8%	7%	0%	0%	14%	0%
Adj. Flow (vph)	754	414	32	12	222	7	28	603	11	7	194	7
Shared Lane Traffic (%)												
Lane Group Flow (vph)	754	446	0	12	229	0	0	642	0	0	208	0
Turn Type	Prot	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Detector Phase	7	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	21.2		21.2	21.2		27.6	27.6		27.6	27.6	
Minimum Split (s)	9.0	27.2		27.2	27.2		33.6	33.6		33.6	33.6	
Total Split (s)	27.0	54.2		27.2	27.2		35.8	35.8		35.8	35.8	
Total Split (%)	30.0%	60.2%		30.2%	30.2%		39.8%	39.8%		39.8%	39.8%	
Maximum Green (s)	23.0	48.2		21.2	21.2		29.8	29.8		29.8	29.8	
Yellow Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	-2.0		0.0	-2.0			-2.0			-2.0	
Total Lost Time (s)	4.0	4.0		6.0	4.0			4.0			4.0	
Lead/Lag	Lag			Lead	Lead							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	23.0	50.2		21.2	23.2			31.8			31.8	
Actuated g/C Ratio	0.26	0.56		0.24	0.26			0.35			0.35	
v/c Ratio	0.91	0.50		0.11	0.55			0.67			0.44	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	28.1	1.5		30.1	34.5			28.6			25.8	
Queue Delay	2.6	1.0		0.0	0.0			0.0			0.0	
Total Delay	30.7	2.5		30.1	34.5			28.6			25.8	
LOS	C	A		C	C			C			C	
Approach Delay		20.2			34.3			28.6			25.8	
Approach LOS		C			C			C			C	
Queue Length 50th (m)	76.9	1.6		1.7	35.7			51.1			28.3	
Queue Length 95th (m)	m#92.4	m2.3		6.6	59.4			70.8			49.0	
Internal Link Dist (m)		84.9			82.9			75.2			115.1	
Turn Bay Length (m)	50.0											
Base Capacity (vph)	827	898		111	416			964			471	
Starvation Cap Reductn	28	224		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.94	0.66		0.11	0.55			0.67			0.44	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 24.5 Intersection LOS: C
Intersection Capacity Utilization 85.0% 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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: Ainslie Street & Park Hill Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	754	414	32	12	222	7	28	603	11	7	194	7
Future Volume (veh/h)	754	414	32	12	222	7	28	603	11	7	194	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	0.99		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1761	1637	1560	1650	1624	1650	1664	1560	1650	1550	1381	1550
Adj Flow Rate, veh/h	754	414	32	12	222	7	28	603	11	7	194	7
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	1	1	7	0	2	0	8	7	0	0	14	0
Cap, veh/h	826	867	67	80	404	13	142	2847	51	64	1312	46
Arrive On Green	0.08	0.19	0.18	0.24	0.26	0.24	1.00	1.00	1.00	1.00	1.00	1.00
Sat Flow, veh/h	3254	1499	116	833	1565	49	96	2767	50	22	1276	45
Grp Volume(v), veh/h	754	0	446	12	0	229	332	0	310	208	0	0
Grp Sat Flow(s),veh/h/ln	1627	0	1615	833	0	1615	1503	0	1410	1343	0	0
Q Serve(g_s), s	20.7	0.0	22.1	0.0	0.0	11.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	20.7	0.0	22.1	21.2	0.0	11.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.07	1.00		0.03	0.08		0.04	0.03		0.03
Lane Grp Cap(c), veh/h	826	0	934	80	0	416	1556	0	1450	1393	0	0
V/C Ratio(X)	0.91	0.00	0.48	0.15	0.00	0.55	0.21	0.00	0.21	0.15	0.00	0.00
Avail Cap(c_a), veh/h	832	0	934	80	0	416	1556	0	1450	1393	0	0
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.37	0.00	0.37	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	40.2	0.0	24.3	45.0	0.0	28.9	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	6.2	0.0	0.6	3.9	0.0	5.2	0.3	0.0	0.3	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.0	0.0	0.2	0.3	0.0	2.7	0.1	0.0	0.1	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.5	0.0	25.0	48.9	0.0	34.1	0.3	0.0	0.3	0.2	0.0	0.0
LnGrp LOS	D	A	C	D	A	C	A	A	A	A	A	A
Approach Vol, veh/h		1200			241			642			208	
Approach Delay, s/veh		38.5			34.8			0.3			0.2	
Approach LOS		D			C			A			A	
Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		98.4		56.0		98.4	28.8	27.2				
Change Period (Y+Rc), s		6.0		6.0		6.0	6.0	* 6				
Max Green Setting (Gmax), s		29.8		48.2		29.8	23.0	* 21				
Max Q Clear Time (g_c+I1), s		2.0		24.1		2.0	22.7	23.2				
Green Ext Time (p_c), s		5.1		3.5		1.4	0.1	0.0				

Intersection Summary

HCM 6th Ctrl Delay 23.9
HCM 6th LOS C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	230	186	20	334	394	15
Future Volume (vph)	230	186	20	334	394	15
Ideal Flow (vphpl)	1650	1650	0	1650	1765	1765
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.940				0.995	
Flt Protected				0.997	0.954	
Satd. Flow (prot)	1382	0	0	1516	1584	0
Flt Permitted				0.997	0.954	
Satd. Flow (perm)	1382	0	0	1516	1584	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	163.9			177.2	162.3	
Travel Time (s)	11.8			12.8	11.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	6%	20%	0%	9%	6%	0%
Adj. Flow (vph)	230	186	20	334	394	15
Shared Lane Traffic (%)						
Lane Group Flow (vph)	416	0	0	354	409	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 70.2%		ICU Level of Service C	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	29.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	230	186	20	334	394	15
Future Vol, veh/h	230	186	20	334	394	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	6	20	0	9	6	0
Mvmt Flow	230	186	20	334	394	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	416	0	697	323
Stage 1	-	-	-	-	323	-
Stage 2	-	-	-	-	374	-
Critical Hdwy	-	-	4.1	-	6.46	6.2
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	-	-	2.2	-	3.554	3.3
Pot Cap-1 Maneuver	-	-	1154	-	401	723
Stage 1	-	-	-	-	725	-
Stage 2	-	-	-	-	687	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1154	-	~ 393	723
Mov Cap-2 Maneuver	-	-	-	-	~ 393	-
Stage 1	-	-	-	-	725	-
Stage 2	-	-	-	-	673	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	83.6
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	400	-	-	1154	-
HCM Lane V/C Ratio	1.023	-	-	0.017	-
HCM Control Delay (s)	83.6	-	-	8.2	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	13	-	-	0.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	592	132	89	335	135	259
Future Volume (vph)	592	132	89	335	135	259
Ideal Flow (vphpl)	1650	1650	0	1650	1765	1765
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.975				0.911	
Flt Protected				0.990	0.983	
Satd. Flow (prot)	1529	0	0	1610	1560	0
Flt Permitted				0.990	0.983	
Satd. Flow (perm)	1529	0	0	1610	1560	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	91.2			171.5	132.1	
Travel Time (s)	6.6			12.3	9.5	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	15%	7%	0%	0%	2%
Adj. Flow (vph)	592	132	89	335	135	259
Shared Lane Traffic (%)						
Lane Group Flow (vph)	724	0	0	424	394	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization	140.9%	ICU Level of Service	H
Analysis Period (min)	15		

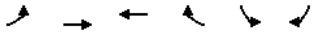
Intersection	
Int Delay, s/veh	47.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	592	132	89	335	135	259
Future Vol, veh/h	592	132	89	335	135	259
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	3	15	7	0	0	2
Mvmt Flow	592	132	89	335	135	259

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	725	0	1172	659
Stage 1	-	-	-	-	659	-
Stage 2	-	-	-	-	513	-
Critical Hdwy	-	-	4.17	-	6.4	6.22
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.263	-	3.5	3.318
Pot Cap-1 Maneuver	-	-	855	-	215	464
Stage 1	-	-	-	-	518	-
Stage 2	-	-	-	-	605	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	854	-	187	464
Mov Cap-2 Maneuver	-	-	-	-	187	-
Stage 1	-	-	-	-	517	-
Stage 2	-	-	-	-	528	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2	182.8
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	308	-	-	854	-
HCM Lane V/C Ratio	1.279	-	-	0.104	-
HCM Control Delay (s)	182.8	-	-	9.7	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	18.7	-	-	0.3	-



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	330	603	262	8	51	189
Future Volume (vph)	330	603	262	8	51	189
Ideal Flow (vphpl)	1650	1650	1650	1650	1765	1765
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.996		0.894	
Flt Protected		0.983			0.989	
Satd. Flow (prot)	0	1590	1643	0	1504	0
Flt Permitted		0.983			0.989	
Satd. Flow (perm)	0	1590	1643	0	1504	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		501.6	92.7		100.6	
Travel Time (s)		36.1	6.7		7.2	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	0%	0%	3%	4%
Adj. Flow (vph)	330	603	262	8	51	189
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	933	270	0	240	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 99.6%		ICU Level of Service F	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	14.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	330	603	262	8	51	189
Future Vol, veh/h	330	603	262	8	51	189
Conflicting Peds, #/hr	5	0	0	5	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	0	0	3	4
Mvmt Flow	330	603	262	8	51	189

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	275	0	-	0	1534	271
Stage 1	-	-	-	-	271	-
Stage 2	-	-	-	-	1263	-
Critical Hdwy	4.12	-	-	-	6.43	6.24
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.218	-	-	-	3.527	3.336
Pot Cap-1 Maneuver	1288	-	-	-	127	763
Stage 1	-	-	-	-	772	-
Stage 2	-	-	-	-	265	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1283	-	-	-	77	760
Mov Cap-2 Maneuver	-	-	-	-	77	-
Stage 1	-	-	-	-	472	-
Stage 2	-	-	-	-	264	-

Approach	EB	WB	SB
HCM Control Delay, s	3.1	0	76.5
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1283	-	-	-	263
HCM Lane V/C Ratio	0.257	-	-	-	0.913
HCM Control Delay (s)	8.8	0	-	-	76.5
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	1	-	-	-	8.2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	191	122	352	3	135	113	73	256	2	14	223	86
Future Volume (vph)	191	122	352	3	135	113	73	256	2	14	223	86
Ideal Flow (vphpl)	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550
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		0.929			0.939			0.999			0.964	
Flt Protected		0.986			0.999			0.989			0.998	
Satd. Flow (prot)	0	1372	0	0	1441	0	0	1474	0	0	1451	0
Flt Permitted		0.986			0.999			0.989			0.998	
Satd. Flow (perm)	0	1372	0	0	1441	0	0	1474	0	0	1451	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		72.9			55.4			112.0			136.8	
Travel Time (s)		5.2			4.0			8.1			9.8	
Confl. Peds. (#/hr)			1	1			2		2	2		2
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	3%	0%	5%	0%	0%	2%	0%	5%	0%	0%	4%	0%
Adj. Flow (vph)	191	122	352	3	135	113	73	256	2	14	223	86
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	665	0	0	251	0	0	331	0	0	323	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 121.5%		ICU Level of Service H	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	87.6
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	191	122	352	3	135	113	73	256	2	14	223	86
Future Vol, veh/h	191	122	352	3	135	113	73	256	2	14	223	86
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	3	0	5	0	0	2	0	5	0	0	4	0
Mvmt Flow	191	122	352	3	135	113	73	256	2	14	223	86
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	170.2	21	30.4	28
HCM LOS	F	C	D	D

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	22%	29%	1%	4%
Vol Thru, %	77%	18%	54%	69%
Vol Right, %	1%	53%	45%	27%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	331	665	251	323
LT Vol	73	191	3	14
Through Vol	256	122	135	223
RT Vol	2	352	113	86
Lane Flow Rate	331	665	251	323
Geometry Grp	1	1	1	1
Degree of Util (X)	0.714	1.298	0.539	0.684
Departure Headway (Hd)	8.636	7.025	8.503	8.505
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	420	519	427	430
Service Time	6.636	5.117	6.503	6.505
HCM Lane V/C Ratio	0.788	1.281	0.588	0.751
HCM Control Delay	30.4	170.2	21	28
HCM Lane LOS	D	F	C	D
HCM 95th-tile Q	5.5	27.7	3.1	5

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	748	408	39	700	175	13
Future Volume (vph)	748	408	39	700	175	13
Ideal Flow (vphpl)	1900	1750	1775	1900	1765	1765
Storage Length (m)		70.0	30.0		0.0	0.0
Storage Lanes		1	1		1	0
Taper Length (m)			85.0		7.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850			0.991	
Flt Protected			0.950		0.956	
Satd. Flow (prot)	1881	1458	1686	1863	1627	0
Flt Permitted			0.950		0.956	
Satd. Flow (perm)	1881	1458	1686	1863	1627	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	198.8			217.2	70.9	
Travel Time (s)	14.3			15.6	5.1	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	2%	0%	2%	3%	0%
Adj. Flow (vph)	748	408	39	700	175	13
Shared Lane Traffic (%)						
Lane Group Flow (vph)	748	408	39	700	188	0
Sign Control	Free			Free	Stop	

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

Intersection	
Int Delay, s/veh	28.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	748	408	39	700	175	13
Future Vol, veh/h	748	408	39	700	175	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	700	300	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	1	2	0	2	3	0
Mvmt Flow	748	408	39	700	175	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1156	0	1526	748
Stage 1	-	-	-	-	748	-
Stage 2	-	-	-	-	778	-
Critical Hdwy	-	-	4.1	-	6.43	6.2
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.2	-	3.527	3.3
Pot Cap-1 Maneuver	-	-	612	-	~ 129	416
Stage 1	-	-	-	-	466	-
Stage 2	-	-	-	-	451	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	612	-	~ 121	416
Mov Cap-2 Maneuver	-	-	-	-	~ 121	-
Stage 1	-	-	-	-	466	-
Stage 2	-	-	-	-	422	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	$ 316.2
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	127	-	-	612	-
HCM Lane V/C Ratio	1.48	-	-	0.064	-
HCM Control Delay (s)	$ 316.2	-	-	11.3	-
HCM Lane LOS	F	-	-	B	-
HCM 95th %tile Q(veh)	13	-	-	0.2	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	117	29	43	77	203	220
Future Volume (vph)	117	29	43	77	203	220
Ideal Flow (vphpl)	1765	1765	1650	1650	1650	1750
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.973				0.930	
Flt Protected	0.961			0.982		
Satd. Flow (prot)	1650	0	0	1460	1496	0
Flt Permitted	0.961			0.982		
Satd. Flow (perm)	1650	0	0	1460	1496	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	148.9			459.2	116.3	
Travel Time (s)	10.7			33.1	8.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	27%	2%	1%	4%
Adj. Flow (vph)	117	29	43	77	203	220
Shared Lane Traffic (%)						
Lane Group Flow (vph)	146	0	0	120	423	0
Sign Control	Stop			Free	Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 54.1%		ICU Level of Service A	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	117	29	43	77	203	220
Future Vol, veh/h	117	29	43	77	203	220
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	27	2	1	4
Mvmt Flow	117	29	43	77	203	220

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	476	313	423	0	-	0
Stage 1	313	-	-	-	-	-
Stage 2	163	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.37	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.443	-	-	-
Pot Cap-1 Maneuver	551	732	1014	-	-	-
Stage 1	746	-	-	-	-	-
Stage 2	871	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	527	732	1014	-	-	-
Mov Cap-2 Maneuver	527	-	-	-	-	-
Stage 1	713	-	-	-	-	-
Stage 2	871	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.7	3.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1014	-	558	-	-
HCM Lane V/C Ratio	0.042	-	0.262	-	-
HCM Control Delay (s)	8.7	0	13.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	1	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (vph)	26	9	114	11	45	15	156	84	3	18	159	45
Future Volume (vph)	26	9	114	11	45	15	156	84	3	18	159	45
Ideal Flow (vphpl)	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550
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		0.897			0.971			0.998			0.973	
Flt Protected		0.991			0.992			0.969			0.996	
Satd. Flow (prot)	0	1357	0	0	1493	0	0	1489	0	0	1481	0
Flt Permitted		0.991			0.992			0.969			0.996	
Satd. Flow (perm)	0	1357	0	0	1493	0	0	1489	0	0	1481	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		242.7			135.8			104.7			319.1	
Travel Time (s)		17.5			9.8			7.5			23.0	
Confl. Peds. (#/hr)	3		1	1		3	5					5
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	2%	0%	0%	0%	1%	0%	0%	0%	2%	0%
Adj. Flow (vph)	26	9	114	11	45	15	156	84	3	18	159	45
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	149	0	0	71	0	0	243	0	0	222	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 56.5%		ICU Level of Service B	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	6.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	26	9	114	11	45	15	156	84	3	18	159	45
Future Vol, veh/h	26	9	114	11	45	15	156	84	3	18	159	45
Conflicting Peds, #/hr	3	0	1	1	0	3	5	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	0	0	2	0	0	0	1	0	0	0	2	0
Mvmt Flow	26	9	114	11	45	15	156	84	3	18	159	45

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	654	622	188	678	643	89	209	0	0	87	0	0
Stage 1	223	223	-	398	398	-	-	-	-	-	-	-
Stage 2	431	399	-	280	245	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.22	7.1	6.5	6.2	4.11	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.318	3.5	4	3.3	2.209	-	-	2.2	-	-
Pot Cap-1 Maneuver	383	405	854	369	394	975	1368	-	-	1522	-	-
Stage 1	784	723	-	632	606	-	-	-	-	-	-	-
Stage 2	607	606	-	731	707	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	303	350	850	282	341	973	1362	-	-	1522	-	-
Mov Cap-2 Maneuver	303	350	-	282	341	-	-	-	-	-	-	-
Stage 1	687	711	-	556	533	-	-	-	-	-	-	-
Stage 2	480	533	-	616	695	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.8	16.6	5.1	0.6
HCM LOS	B	C		

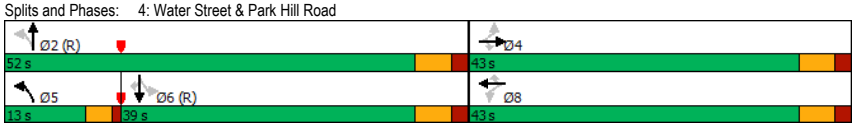
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1362	-	-	607	381	1522	-	-
HCM Lane V/C Ratio	0.115	-	-	0.245	0.186	0.012	-	-
HCM Control Delay (s)	8	0	-	12.8	16.6	7.4	0	-
HCM Lane LOS	A	A	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0.4	-	-	1	0.7	0	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	849	162	9	443	10	233	184	49	12	650	982
Future Volume (vph)	29	849	162	9	443	10	233	184	49	12	650	982
Ideal Flow (vphpl)	1775	1775	1750	1775	1650	1650	1775	1650	1650	1775	1900	1750
Storage Length (m)	0.0		10.0	0.0		15.0	22.0		0.0	38.0		0.0
Storage Lanes	0		1	0		1	1		0	1		1
Taper Length (m)	7.5			7.5			20.0			50.0		
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.968				0.850
Flt Protected		0.998			0.999		0.950			0.950		
Satd. Flow (prot)	0	3334	1473	0	1632	1402	1670	1585	0	1686	1863	1473
Flt Permitted		0.917			0.980		0.108			0.613		
Satd. Flow (perm)	0	3063	1473	0	1601	1402	190	1585	0	1088	1863	1473
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			80			80		20				239
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		179.1			108.9			140.9			142.0	
Travel Time (s)		12.9			7.8			10.1			10.2	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	1%	1%	0%	0%	2%	1%
Adj. Flow (vph)	29	849	162	9	443	10	233	184	49	12	650	982
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	878	162	0	452	10	233	233	0	12	650	982
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA		Perm	NA	Perm
Protected Phases		4			8		5	2			6	
Permitted Phases	4		4	8		8	2			6		6
Detector Phase	4	4	4	8	8	8	5	2		6	6	6
Switch Phase												
Minimum Initial (s)	24.4	24.4	24.4	24.4	24.4	24.4	5.0	32.4		31.0	31.0	31.0
Minimum Split (s)	30.4	30.4	30.4	30.4	30.4	30.4	9.0	38.4		37.0	37.0	37.0
Total Split (s)	43.0	43.0	43.0	43.0	43.0	43.0	13.0	52.0		39.0	39.0	39.0
Total Split (%)	45.3%	45.3%	45.3%	45.3%	45.3%	45.3%	13.7%	54.7%		41.1%	41.1%	41.1%
Maximum Green (s)	37.0	37.0	37.0	37.0	37.0	37.0	9.0	46.0		33.0	33.0	33.0
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)		-2.0	-2.0		-2.0	0.0	0.0	-2.0		-2.0	-2.0	-2.0
Total Lost Time (s)		4.0	4.0		4.0	6.0	4.0	4.0		4.0	4.0	4.0
Lead/Lag							Lead			Lag	Lag	Lag
Lead-Lag Optimize?							Yes			Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	Max	Max	Max	Max	Max	Max	None	C-Max		C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0		11.0		11.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0	0	0	0	0		0		0	0	0
Act Effct Green (s)		39.0	39.0		39.0	37.0	48.0	48.0		35.0	35.0	35.0
Actuated g/C Ratio		0.41	0.41		0.41	0.39	0.51	0.51		0.37	0.37	0.37
v/c Ratio		0.70	0.25		0.69	0.02	0.99	0.29		0.03	0.95	1.42
Control Delay		26.8	10.6		29.6	0.1	78.8	13.5		19.6	54.2	218.3
Queue Delay		0.0	0.0		14.6	0.0	0.0	0.0		0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		26.8	10.6		44.2	0.1	78.8	13.5		19.6	54.2	218.3
LOS		C	B		D	A	E	B		B	D	F
Approach Delay		24.3			43.2			46.2			152.0	
Approach LOS		C			D			D			F	
Queue Length 50th (m)		72.0	9.7		70.1	0.0	29.0	22.5		1.5	119.8	~227.7
Queue Length 95th (m)		94.8	23.3		106.6	0.0	#78.0	38.1		5.3	#191.7	#305.0
Internal Link Dist (m)		155.1			84.9			116.9			118.0	
Turn Bay Length (m)			10.0			15.0	22.0			38.0		
Base Capacity (vph)		1257	651		657	594	236	810		400	686	693
Starvation Cap Reductn		0	0		190	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		0.70	0.25		0.97	0.02	0.99	0.29		0.03	0.95	1.42

Intersection Summary			
Area Type:	Other		
Cycle Length: 95			
Actuated Cycle Length: 95			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.42			
Intersection Signal Delay: 87.7		Intersection LOS: F	
Intersection Capacity Utilization 117.3%		ICU Level of Service H	
Analysis Period (min) 15			
~ Volume exceeds capacity, queue is theoretically infinite.			
Queue shown is maximum after two cycles.			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 4: Water Street & Park Hill Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	849	162	9	443	10	233	184	49	12	650	982
Future Volume (veh/h)	29	849	162	9	443	10	233	184	49	12	650	982
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1775	1761	1736	1775	1637	1650	1761	1637	1650	1775	1870	1736
Adj Flow Rate, veh/h	29	849	162	9	443	10	233	184	49	12	650	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	1	1	0	1	0	1	1	0	0	2	1
Cap, veh/h	60	1202	604	43	657	545	243	629	168	477	689	
Arrive On Green	0.39	0.41	0.41	0.41	0.41	0.39	0.09	0.51	0.48	0.37	0.37	0.00
Sat Flow, veh/h	47	2928	1471	11	1600	1398	1677	1246	332	1089	1870	1471
Grp Volume(v), veh/h	430	448	162	452	0	10	233	0	233	12	650	0
Grp Sat Flow(s),veh/h/ln	1453	1523	1471	1611	0	1398	1677	0	1577	1089	1870	1471
Q Serve(g_s), s	4.9	23.4	6.9	0.0	0.0	0.4	8.4	0.0	8.2	0.7	32.0	0.0
Cycle Q Clear(g_c), s	26.2	23.4	6.9	21.4	0.0	0.4	8.4	0.0	8.2	0.7	32.0	0.0
Prop In Lane	0.07		1.00	0.02		1.00	1.00		0.21	1.00		1.00
Lane Grp Cap(c), veh/h	606	625	604	700	0	545	243	0	797	477	689	
V/C Ratio(X)	0.71	0.72	0.27	0.65	0.00	0.02	0.96	0.00	0.29	0.03	0.94	
Avail Cap(c_a), veh/h	606	625	604	700	0	545	243	0	797	477	689	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.42	0.00	0.42	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.8	23.4	18.5	22.8	0.0	17.8	22.8	0.0	13.8	19.2	29.0	0.0
Incr Delay (d2), s/veh	6.9	6.9	1.1	1.9	0.0	0.0	46.5	0.0	0.9	0.1	22.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	4.4	1.1	3.5	0.0	0.1	4.1	0.0	0.9	0.1	10.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.7	30.3	19.6	24.7	0.0	17.9	69.3	0.0	14.7	19.3	51.9	0.0
LnGrp LOS	C	C	B	C	A	B	E	A	B	B	D	
Approach Vol, veh/h		1040			462			466			662	A
Approach Delay, s/veh		28.4			24.6			42.0			51.3	
Approach LOS		C			C			D			D	
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		52.0		43.0	13.0	39.0		43.0				
Change Period (Y+Rc), s		6.0		6.0	4.0	6.0		6.0				
Max Green Setting (Gmax), s		46.0		37.0	9.0	33.0		37.0				
Max Q Clear Time (g_c+I1), s		10.2		28.2	10.4	34.0		23.4				
Green Ext Time (p_c), s		1.8		4.6	0.0	0.0		2.9				
Intersection Summary												
HCM 6th Ctrl Delay			35.9									
HCM 6th LOS			D									

Notes

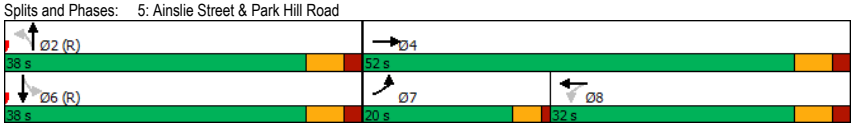
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	514	325	50	29	405	23	43	611	14	10	403	32
Future Volume (vph)	514	325	50	29	405	23	43	611	14	10	403	32
Ideal Flow (vphpl)	1775	1650	1650	1650	1650	1650	1775	1650	1650	1550	1550	1550
Storage Length (m)	50.0		0.0	0.0		0.0	30.0		0.0	10.0		0.0
Storage Lanes	2		0	1		0	0		0	0		0
Taper Length (m)	15.0			7.5			7.5			7.5		
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	0.99	0.99		0.99	1.00			1.00			1.00	
Frt		0.980			0.992			0.997			0.990	
Flt Protected	0.950			0.950				0.997			0.999	
Satd. Flow (prot)	3239	1586	0	1568	1620	0	0	2893	0	0	1484	0
Flt Permitted	0.950			0.539				0.887			0.982	
Satd. Flow (perm)	3212	1586	0	877	1620	0	0	2572	0	0	1459	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			3			3			5	
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		108.9			106.9			99.2			139.1	
Travel Time (s)		7.8			7.7			7.1			10.0	
Confl. Peds. (#/hr)	6		9	9		6	12		7	7		12
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	1%	1%	4%	0%	1%	0%	5%	8%	0%	0%	3%	3%
Adj. Flow (vph)	514	325	50	29	405	23	43	611	14	10	403	32
Shared Lane Traffic (%)												
Lane Group Flow (vph)	514	375	0	29	428	0	0	668	0	0	445	0
Turn Type	Prot	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases	7	4			8			2			6	
Permitted Phases				8			2			6		
Detector Phase	7	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	5.0	22.8		22.8	22.8		30.8	30.8		30.8	30.8	
Minimum Split (s)	9.0	28.8		28.8	28.8		36.8	36.8		36.8	36.8	
Total Split (s)	20.0	52.0		32.0	32.0		38.0	38.0		38.0	38.0	
Total Split (%)	22.2%	57.8%		35.6%	35.6%		42.2%	42.2%		42.2%	42.2%	
Maximum Green (s)	16.0	46.0		26.0	26.0		32.0	32.0		32.0	32.0	
Yellow Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lost Time Adjust (s)	0.0	-2.0		0.0	-2.0			-2.0			-2.0	
Total Lost Time (s)	4.0	4.0		6.0	4.0			4.0			4.0	
Lead/Lag	Lead			Lag	Lag							
Lead-Lag Optimize?	Yes			Yes	Yes							
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	Max		Max	Max		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)		7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0		0	0		0	0		0	0	
Act Effct Green (s)	15.9	48.0		26.1	28.1			34.0			34.0	
Actuated g/C Ratio	0.18	0.53		0.29	0.31			0.38			0.38	
v/c Ratio	0.90	0.44		0.11	0.84			0.69			0.80	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Control Delay	56.9	14.4		25.1	45.9			27.8			37.8	
Queue Delay	0.0	2.0		0.0	0.0			0.0			0.0	
Total Delay	56.9	16.4		25.1	45.9			27.8			37.8	
LOS	E	B		C	D			C			D	
Approach Delay		39.8			44.5			27.8			37.8	
Approach LOS		D			D			C			D	
Queue Length 50th (m)	47.6	37.8		3.9	71.9			52.5			70.2	
Queue Length 95th (m)	#76.3	59.7		10.9	#124.9			73.1			#122.5	
Internal Link Dist (m)		84.9			82.9			75.2			115.1	
Turn Bay Length (m)	50.0											
Base Capacity (vph)	575	851		254	507			973			554	
Starvation Cap Reductn	0	325		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.89	0.71		0.11	0.84			0.69			0.80	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 37.1		Intersection LOS: D	
Intersection Capacity Utilization 95.3%		ICU Level of Service F	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 5: Ainslie Street & Park Hill Road



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	514	325	50	29	405	23	43	611	14	10	403	32
Future Volume (veh/h)	514	325	50	29	405	23	43	611	14	10	403	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1761	1637	1599	1650	1637	1650	1706	1547	1650	1550	1514	1514
Adj Flow Rate, veh/h	514	325	50	29	405	23	43	611	14	10	403	32
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	1	1	4	0	1	0	5	8	0	0	3	3
Cap, veh/h	576	738	114	335	478	27	85	967	22	45	513	40
Arrive On Green	0.18	0.53	0.51	0.29	0.31	0.29	0.36	0.38	0.36	0.36	0.38	0.36
Sat Flow, veh/h	3254	1384	213	881	1533	87	106	2560	58	12	1359	106
Grp Volume(v), veh/h	514	0	375	29	0	428	330	0	338	445	0	0
Grp Sat Flow(s),veh/h/ln	1627	0	1597	881	0	1620	1328	0	1396	1477	0	0
Q Serve(g_s), s	13.9	0.0	13.0	2.2	0.0	22.2	0.0	0.0	17.9	4.3	0.0	0.0
Cycle Q Clear(g_c), s	13.9	0.0	13.0	2.2	0.0	22.2	18.0	0.0	17.9	24.6	0.0	0.0
Prop In Lane	1.00		0.13	1.00		0.05	0.13		0.04	0.02		0.07
Lane Grp Cap(c), veh/h	576	0	852	335	0	505	517	0	527	566	0	0
V/C Ratio(X)	0.89	0.00	0.44	0.09	0.00	0.85	0.64	0.00	0.64	0.79	0.00	0.00
Avail Cap(c_a), veh/h	578	0	852	335	0	505	517	0	527	566	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.66	0.00	0.66	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	36.2	0.0	12.9	23.5	0.0	29.0	22.6	0.0	23.0	25.1	0.0	0.0
Incr Delay (d2), s/veh	11.4	0.0	1.1	0.5	0.0	16.0	5.9	0.0	5.9	10.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	0.0	0.8	0.3	0.0	6.1	3.2	0.0	3.1	5.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.6	0.0	14.0	24.0	0.0	45.0	28.5	0.0	28.9	35.7	0.0	0.0
LnGrp LOS	D	A	B	C	A	D	C	A	C	D	A	A
Approach Vol, veh/h		889			457			668			445	
Approach Delay, s/veh		33.4			43.7			28.7			35.7	
Approach LOS		C			D			C			D	
Timer - Assigned Phs		2		4		6	7	8				
Phs Duration (G+Y+Rc), s		38.0		52.0		38.0	19.9	32.1				
Change Period (Y+Rc), s		6.0		6.0		6.0	4.0	6.0				
Max Green Setting (Gmax), s		32.0		46.0		32.0	16.0	26.0				
Max Q Clear Time (g_c+I1), s		20.0		15.0		26.6	15.9	24.2				
Green Ext Time (p_c), s		3.8		3.0		1.5	0.0	0.6				

Intersection Summary		
HCM 6th Ctrl Delay	34.5	
HCM 6th LOS	C	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	329	381	24	286	226	26
Future Volume (vph)	329	381	24	286	226	26
Ideal Flow (vphpl)	1650	1650	0	1650	1765	1765
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.928				0.986	
Flt Protected				0.996	0.957	
Satd. Flow (prot)	1452	0	0	1599	1541	0
Flt Permitted				0.996	0.957	
Satd. Flow (perm)	1452	0	0	1599	1541	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	163.9			177.2	162.3	
Travel Time (s)	11.8			12.8	11.7	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	6%	5%	0%	3%	9%	0%
Adj. Flow (vph)	329	381	24	286	226	26
Shared Lane Traffic (%)						
Lane Group Flow (vph)	710	0	0	310	252	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 68.6%		ICU Level of Service C	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	9.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	329	381	24	286	226	26
Future Vol, veh/h	329	381	24	286	226	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	6	5	0	3	9	0
Mvmt Flow	329	381	24	286	226	26

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	710	0	854	520
Stage 1	-	-	-	-	520	-
Stage 2	-	-	-	-	334	-
Critical Hdwy	-	-	4.1	-	6.49	6.2
Critical Hdwy Stg 1	-	-	-	-	5.49	-
Critical Hdwy Stg 2	-	-	-	-	5.49	-
Follow-up Hdwy	-	-	2.2	-	3.581	3.3
Pot Cap-1 Maneuver	-	-	899	-	320	560
Stage 1	-	-	-	-	583	-
Stage 2	-	-	-	-	710	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	899	-	310	560
Mov Cap-2 Maneuver	-	-	-	-	310	-
Stage 1	-	-	-	-	583	-
Stage 2	-	-	-	-	687	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	45.7
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	325	-	-	899	-
HCM Lane V/C Ratio	0.775	-	-	0.027	-
HCM Control Delay (s)	45.7	-	-	9.1	0
HCM Lane LOS	E	-	-	A	A
HCM 95th %tile Q(veh)	6.2	-	-	0.1	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	468	147	267	642	142	154
Future Volume (vph)	468	147	267	642	142	154
Ideal Flow (vphpl)	1650	1650	0	1650	1765	1765
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.968				0.930	
Flt Protected				0.986	0.977	
Satd. Flow (prot)	1597	0	0	1600	1604	0
Flt Permitted				0.986	0.977	
Satd. Flow (perm)	1597	0	0	1600	1604	0
Link Speed (k/h)	50			50	50	
Link Distance (m)	91.2			171.5	132.1	
Travel Time (s)	6.6			12.3	9.5	
Confl. Peds. (#/hr)		1	1			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	1%	2%	0%	0%
Adj. Flow (vph)	468	147	267	642	142	154
Shared Lane Traffic (%)						
Lane Group Flow (vph)	615	0	0	909	296	0
Sign Control	Free			Free	Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 334.8%		ICU Level of Service H	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	145.1

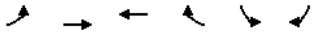
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	468	147	267	642	142	154
Future Vol, veh/h	468	147	267	642	142	154
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	1	2	0	0
Mvmt Flow	468	147	267	642	142	154

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	616	0	1719	543
Stage 1	-	-	-	-	543	-
Stage 2	-	-	-	-	1176	-
Critical Hdwy	-	-	4.11	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.209	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	969	-	~ 100	544
Stage 1	-	-	-	-	586	-
Stage 2	-	-	-	-	296	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	968	-	~ 57	544
Mov Cap-2 Maneuver	-	-	-	-	~ 57	-
Stage 1	-	-	-	-	585	-
Stage 2	-	-	-	-	169	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3	$ 883.1
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	107	-	-	968	-
HCM Lane V/C Ratio	2.766	-	-	0.276	-
HCM Control Delay (s)	$ 883.1	-	-	10.1	0
HCM Lane LOS	F	-	-	B	A
HCM 95th %tile Q(veh)	27.6	-	-	1.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	227	455	631	31	45	381
Future Volume (vph)	227	455	631	31	45	381
Ideal Flow (vphpl)	1650	1650	1650	1650	1765	1765
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.994		0.879	
Flt Protected		0.984			0.995	
Satd. Flow (prot)	0	1592	1640	0	1486	0
Flt Permitted		0.984			0.995	
Satd. Flow (perm)	0	1592	1640	0	1486	0
Link Speed (k/h)		50	50		50	
Link Distance (m)		501.6	92.7		100.6	
Travel Time (s)		36.1	6.7		7.2	
Confl. Peds. (#/hr)	5			5		
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	2%	2%	0%	0%	3%	4%
Adj. Flow (vph)	227	455	631	31	45	381
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	682	662	0	426	0
Sign Control		Free	Free		Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 120.5%		ICU Level of Service H	
Analysis Period (min) 15			

Intersection	
Int Delay, s/veh	54.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	227	455	631	31	45	381
Future Vol, veh/h	227	455	631	31	45	381
Conflicting Peds, #/hr	5	0	0	5	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	0	0	3	4
Mvmt Flow	227	455	631	31	45	381

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	667	0	-	0	1561	652
Stage 1	-	-	-	-	652	-
Stage 2	-	-	-	-	909	-
Critical Hdwy	4.12	-	-	-	6.43	6.24
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.218	-	-	-	3.527	3.336
Pot Cap-1 Maneuver	923	-	-	-	123	464
Stage 1	-	-	-	-	517	-
Stage 2	-	-	-	-	391	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	919	-	-	-	82	462
Mov Cap-2 Maneuver	-	-	-	-	82	-
Stage 1	-	-	-	-	344	-
Stage 2	-	-	-	-	389	-

Approach	EB	WB	SB
HCM Control Delay, s	3.4	0	220.3
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	919	-	-	-	310
HCM Lane V/C Ratio	0.247	-	-	-	1.374
HCM Control Delay (s)	10.2	0	-	-	220.3
HCM Lane LOS	B	A	-	-	F
HCM 95th %tile Q(veh)	1	-	-	-	21.8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	138	97	257	5	308	131	156	204	5	11	391	205
Future Volume (vph)	138	97	257	5	308	131	156	204	5	11	391	205
Ideal Flow (vphpl)	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550	1550
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		0.929			0.960			0.998			0.954	
Flt Protected		0.986			0.999			0.979			0.999	
Satd. Flow (prot)	0	1412	0	0	1473	0	0	1485	0	0	1477	0
Flt Permitted		0.986			0.999			0.979			0.999	
Satd. Flow (perm)	0	1412	0	0	1473	0	0	1485	0	0	1477	0
Link Speed (k/h)		50			50			50			50	
Link Distance (m)		72.9			55.4			112.0			136.8	
Travel Time (s)		5.2			4.0			8.1			9.8	
Confl. Peds. (#/hr)	2		3	3		2	4		5	5		4
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles (%)	0%	0%	1%	0%	0%	3%	2%	2%	0%	0%	0%	0%
Adj. Flow (vph)	138	97	257	5	308	131	156	204	5	11	391	205
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	492	0	0	444	0	0	365	0	0	607	0
Sign Control		Stop			Stop			Stop			Stop	

Intersection Summary			
Area Type:	Other		
Control Type: Unsignalized			
Intersection Capacity Utilization 144.0%		ICU Level of Service H	
Analysis Period (min) 15			

Intersection	
Intersection Delay, s/veh	189.6
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	138	97	257	5	308	131	156	204	5	11	391	205
Future Vol, veh/h	138	97	257	5	308	131	156	204	5	11	391	205
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	0	0	1	0	0	3	2	2	0	0	0	0
Mvmt Flow	138	97	257	5	308	131	156	204	5	11	391	205
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	176.7	137	87.9	299.8
HCM LOS	F	F	F	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	43%	28%	1%	2%
Vol Thru, %	56%	20%	69%	64%
Vol Right, %	1%	52%	30%	34%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	365	492	444	607
LT Vol	156	138	5	11
Through Vol	204	97	308	391
RT Vol	5	257	131	205
Lane Flow Rate	365	492	444	607
Geometry Grp	1	1	1	1
Degree of Util (X)	0.983	1.27	1.157	1.577
Departure Headway (Hd)	12.958	11.546	12.02	10.673
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	285	320	306	346
Service Time	10.958	9.546	10.02	8.673
HCM Lane V/C Ratio	1.281	1.538	1.451	1.754
HCM Control Delay	87.9	176.7	137	299.8
HCM Lane LOS	F	F	F	F
HCM 95th-tile Q	9.8	18.5	14.7	30.8

Junctions 8

ARCADY 8 - Roundabout Module

Version: 8.0.6.541 [19821,26/11/2015]

For sales and distribution information, program advice and maintenance, contact TRL:
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Filename: Blenheim & Bismark.arc8
Path: C:\Users\AdamMorrison\Paradigm\Projects - 180312 Westwood\C5 - Analysis and Evaluation\Arcady
Report generation date: 2021-04-22 10:42:31 AM

Summary of intersection performance

	AM					
	Queue (Veh)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS
	A1 - 2030 Total					
Leg North	0.09	5.10	0.09	A	6.34	A
Leg West	0.77	5.52	0.44	A		
Leg South	1.15	7.62	0.54	A		
Leg East	0.44	5.62	0.31	A		

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages.

"D1 - 2030 Background, AM" model duration: 8:00 AM - 9:30 AM
"D2 - 2030 Background, PM" model duration: 4:00 PM - 5:30 PM
"D3 - 2030 Total, AM " model duration: 8:00 AM - 9:30 AM
"D4 - 2030 Total, PM" model duration: 4:00 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2021-04-22 10:42:30 AM

File summary

Title	Blenheim & Bismark / Street H
Location	Cambridge
Site Number	
Date	2016-05-05
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	100210
Analyst	Matt
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	V/C Ratio Threshold	Average Delay Threshold (s)	Queue Threshold (PCE)
7.50	✓		N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	Veh	Veh	perHour	s	-Min	perMin

(Default Analysis Set) - 2030 Total, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set (s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relationship
2030 Total, AM	2030 Total	AM		ONE HOUR	08:00	09:30	90	15				✓		

Intersection Network

Intersections

Intersection	Name	Intersection Type	Leg Order	Grade Separated	Large Roundabout	Do Geometric Delay	Intersection Delay (s)	Intersection LOS
1	(untitled)	Roundabout	North,West,South,East				6.34	A

Intersection Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Bismark Drive SB	
West	West	Blenheim Road EB	
South	South	Street G NB	
East	East	Blenheim Road WB	

Capacity Options

Leg	Minimum Capacity (PCE/hr)	Maximum Capacity (PCE/hr)	Assume Flat Start Profile	Initial Queue (PCE)
North	0.00	99999.00		0.00
West	0.00	99999.00		0.00
South	0.00	99999.00		0.00
East	0.00	99999.00		0.00

Roundabout Geometry

Leg	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
North	3.50	4.50	30.00	20.00	40.00	25.00	
West	3.50	4.50	30.00	20.00	40.00	25.00	
South	3.50	4.50	30.00	20.00	40.00	25.00	
East	3.50	4.50	30.00	20.00	40.00	25.00	

Slope / Intercept / Capacity

Leg Intercept Adjustments

Leg	Type	Reason	Direct Intercept Adjustment (PCE/hr)	Percentage Intercept Adjustment (%)
North	Percentage	Region of Waterloo Requirement		90.00
West	Percentage	Region of Waterloo Requirement		90.00
South	Percentage	Region of Waterloo Requirement		90.00
East	Percentage	Region of Waterloo Requirement		90.00

Roundabout Slope and Intercept used in model

Leg	Enter slope and intercept directly	Entered slope	Entered intercept (PCE/hr)	Final Slope	Final Intercept (PCE/hr)
North		(calculated)	(calculated)	0.579	1221.701
West		(calculated)	(calculated)	0.579	1221.701
South		(calculated)	(calculated)	0.579	1221.701
East		(calculated)	(calculated)	0.579	1221.701

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCE Factor for a Truck (PCE)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	Truck Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Leg	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
North	ONE HOUR	✓	60.00	100.000
West	ONE HOUR	✓	459.00	100.000
South	ONE HOUR	✓	496.00	100.000
East	ONE HOUR	✓	257.00	100.000

Turning Proportions

Turning Counts / Proportions (Veh/hr) - Intersection 1 (for whole period)

		To			
		North	**West**	**South**	**East**
From	**North**	0.000	31.000	17.000	12.000
	West	10.000	0.000	190.000	259.000
	South	5.000	415.000	0.000	76.000
	East	4.000	218.000	35.000	0.000

Turning Proportions (Veh) - Intersection 1 (for whole period)

		To			
		North	**West**	**South**	**East**
From	**North**	0.00	0.52	0.28	0.20
	West	0.02	0.00	0.41	0.56
	South	0.01	0.84	0.00	0.15
	East	0.02	0.85	0.14	0.00

Vehicle Mix

Average PCE Per Vehicle - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	1.020	1.020	1.020	1.020
	West	1.020	1.020	1.020	1.020
	South	1.020	1.020	1.020	1.020
	East	1.020	1.020	1.020	1.020

Truck Percentages - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	2.0	2.0	2.0	2.0
	West	2.0	2.0	2.0	2.0
	South	2.0	2.0	2.0	2.0
	East	2.0	2.0	2.0	2.0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Intersection Arrivals (Veh)	Total Queueing Delay (Veh-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (Veh-min/min)	Inclusive Total Queueing Delay (Veh-min)	Inclusive Average Queueing Delay (s)
North	0.09	5.10	0.09	~1	A	55.06	82.59	6.37	4.63	0.07	6.37	4.63
West	0.44	5.52	0.77	1.00	A	421.19	631.78	51.79	4.92	0.58	51.79	4.92
South	0.54	7.62	1.15	?	A	455.14	682.71	71.55	6.29	0.80	71.56	6.29
East	0.31	5.62	0.44	1.00	A	235.83	353.74	29.41	4.99	0.33	29.42	4.99

Main Results for each time segment

Main results: (08:00-08:15)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	45.17	11.29	44.96	14.23	500.22	0.00	908.24	357.69	0.050	0.00	0.05	4.169	A
West	345.56	86.39	343.89	497.22	47.95	0.00	1169.99	1035.41	0.295	0.00	0.42	4.349	A
South	373.41	93.35	371.31	181.31	210.53	0.00	1075.90	805.15	0.347	0.00	0.53	5.094	A
East	193.48	48.37	192.54	259.94	321.91	0.00	1011.44	790.11	0.191	0.00	0.24	4.392	A

Main results: (08:15-08:30)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	53.94	13.48	53.88	17.06	599.56	0.00	850.75	357.69	0.063	0.05	0.07	4.517	A
West	412.63	103.16	412.12	595.97	57.47	0.00	1164.49	1035.41	0.354	0.42	0.54	4.782	A
South	445.89	111.47	445.09	217.28	252.30	0.00	1051.72	805.15	0.424	0.53	0.73	5.927	A
East	231.04	57.76	230.74	311.52	385.87	0.00	974.42	790.11	0.237	0.24	0.31	4.838	A

Main results: (08:30-08:45)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	66.06	16.52	65.96	20.88	733.61	0.00	773.16	357.69	0.085	0.07	0.09	5.090	A
West	505.37	126.34	504.48	729.23	70.35	0.00	1157.03	1035.41	0.437	0.54	0.77	5.508	A
South	546.11	136.53	544.48	265.98	308.84	0.00	1019.00	805.15	0.536	0.73	1.13	7.561	A
East	282.96	70.74	282.45	381.28	472.04	0.00	924.55	790.11	0.306	0.31	0.44	5.601	A

Main results: (08:45-09:00)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	66.06	16.52	66.06	20.92	735.44	0.00	772.10	357.69	0.086	0.09	0.09	5.098	A
West	505.37	126.34	505.35	731.03	70.46	0.00	1156.96	1035.41	0.437	0.77	0.77	5.524	A
South	546.11	136.53	546.07	266.44	309.38	0.00	1018.69	805.15	0.536	1.13	1.15	7.616	A
East	282.96	70.74	282.95	382.04	473.40	0.00	923.76	790.11	0.306	0.44	0.44	5.617	A

Main results: (09:00-09:15)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	53.94	13.48	54.04	17.12	602.35	0.00	849.13	357.69	0.064	0.09	0.07	4.529	A
West	412.63	103.16	413.50	598.74	57.65	0.00	1164.38	1035.41	0.354	0.77	0.55	4.799	A
South	445.89	111.47	447.49	218.01	253.14	0.00	1051.24	805.15	0.424	1.15	0.74	5.980	A
East	231.04	57.76	231.54	312.70	387.94	0.00	973.22	790.11	0.237	0.44	0.31	4.856	A

Main results: (09:15-09:30)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	45.17	11.29	45.23	14.33	503.90	0.00	906.11	357.69	0.050	0.07	0.05	4.181	A
West	345.56	86.39	346.08	500.88	48.25	0.00	1169.82	1035.41	0.295	0.55	0.42	4.372	A
South	373.41	93.35	374.25	182.47	211.87	0.00	1075.12	805.15	0.347	0.74	0.54	5.144	A
East	193.48	48.37	193.78	261.68	324.44	0.00	1009.97	790.11	0.192	0.31	0.24	4.413	A

Queueing Delay Results for each time segment

Queueing Delay results: (08:00-08:15)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	0.76	0.05	4.169	A	A
West	6.08	0.41	4.349	A	A
South	7.65	0.51	5.094	A	A
East	3.44	0.23	4.392	A	A

Queueing Delay results: (08:15-08:30)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	0.99	0.07	4.517	A	A
West	8.00	0.53	4.782	A	A
South	10.63	0.71	5.927	A	A
East	4.54	0.30	4.838	A	A

Queueing Delay results: (08:30-08:45)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	1.37	0.09	5.090	A	A
West	11.21	0.75	5.508	A	A
South	16.37	1.09	7.561	A	A
East	6.41	0.43	5.601	A	A

Queueing Delay results: (08:45-09:00)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	1.40	0.09	5.098	A	A
West	11.55	0.77	5.524	A	A
South	17.12	1.14	7.616	A	A
East	6.58	0.44	5.617	A	A

Queueing Delay results: (09:00-09:15)

	Queueing Total Delay (Veh-	Queueing Rate Of Delay (Veh-	Average Delay Per Arriving	Unsignalised Level Of	Signalised Level Of

Leg	min)	min/min)	Vehicle (s)	Service	Service
North	1.04	0.07	4.529	A	A
West	8.50	0.57	4.799	A	A
South	11.54	0.77	5.980	A	A
East	4.80	0.32	4.856	A	A

Queueing Delay results: (09:15-09:30)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	0.80	0.05	4.181	A	A
West	6.46	0.43	4.372	A	A
South	8.25	0.55	5.144	A	A
East	3.64	0.24	4.413	A	A

Queue Variation Results for each time segment

Queue Variation results: (08:00-08:15)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.05	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.42	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.53	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.24	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (08:15-08:30)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.07	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.54	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.73	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.31	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (08:30-08:45)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.09	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.77	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	1.13	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.44	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (08:45-09:00)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.09	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.77	0.00	0.00	0.00	1.00			N/A	N/A

South	1.15	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.44	0.00	0.00	0.00	1.00			N/A	N/A

Queue Variation results: (09:00-09:15)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.07	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.55	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.74	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.31	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (09:15-09:30)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.05	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.42	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.54	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.24	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Junctions 8

ARCADY 8 - Roundabout Module

Version: 8.0.6.541 [19821,26/11/2015]

Filename: Blenheim & Bismark.arc8
Path: C:\Users\AdamMorrison\Paradigm\Projects - 180312 Westwood\C5 - Analysis and Evaluation\Arcady
Report generation date: 2021-04-22 10:42:47 AM

Summary of intersection performance

	PM					
	Queue (Veh)	Delay (s)	V/C Ratio	LOS	Intersection Delay (s)	Intersection LOS
	A1 - 2030 Total					
Leg North	0.05	4.95	0.05	A	8.69	A
Leg West	2.48	11.35	0.72	B		
Leg South	0.80	6.35	0.45	A		
Leg East	0.73	6.47	0.42	A		

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle. Intersection LOS and Intersection Delay are demand-weighted averages.

"D1 - 2030 Background, AM" model duration: 8:00 AM - 9:30 AM
"D2 - 2030 Background, PM" model duration: 4:00 PM - 5:30 PM
"D3 - 2030 Total, AM" model duration: 8:00 AM - 9:30 AM
"D4 - 2030 Total, PM " model duration: 4:00 PM - 5:30 PM

Run using Junctions 8.0.6.541 at 2021-04-22 10:42:46 AM

File summary

Title	Blenheim & Bismark / Street H
Location	Cambridge
Site Number	
Date	2016-05-05
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	100210
Analyst	Matt
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	V/C Ratio Threshold	Average Delay Threshold (s)	Queue Threshold (PCE)
7.50	✓		N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	Veh	Veh	perHour	s	-Min	perMin

(Default Analysis Set) - 2030 Total, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Include In Report	Use Specific Demand Set(s)	Specific Demand Set (s)	Locked	Network Flow Scaling Factor (%)	Network Capacity Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	ARCADY		✓				100.000	100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Results For Central Hour Only	Single Time Segment Only	Locked	Run Automatically	Use Relationship	Relationship
2030 Total, PM	2030 Total	PM		ONE HOUR	16:00	17:30	90	15				✓		

Intersection Network

Intersections

Intersection	Name	Intersection Type	Leg Order	Grade Separated	Large Roundabout	Do Geometric Delay	Intersection Delay (s)	Intersection LOS
1	(untitled)	Roundabout	North,West,South,East				8.69	A

Intersection Network Options

Driving Side	Lighting
Right	Normal/unknown

Legs

Legs

Leg	Leg	Name	Description
North	North	Bismark Drive SB	
West	West	Blenheim Road EB	
South	South	Street G NB	
East	East	Blenheim Road WB	

Capacity Options

Leg	Minimum Capacity (PCE/hr)	Maximum Capacity (PCE/hr)	Assume Flat Start Profile	Initial Queue (PCE)
North	0.00	99999.00		0.00
West	0.00	99999.00		0.00
South	0.00	99999.00		0.00
East	0.00	99999.00		0.00

Roundabout Geometry

Leg	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
North	3.50	4.50	30.00	20.00	40.00	25.00	
West	3.50	4.50	30.00	20.00	40.00	25.00	
South	3.50	4.50	30.00	20.00	40.00	25.00	
East	3.50	4.50	30.00	20.00	40.00	25.00	

Slope / Intercept / Capacity

Leg Intercept Adjustments

Leg	Type	Reason	Direct Intercept Adjustment (PCE/hr)	Percentage Intercept Adjustment (%)
North	Percentage	Region of Waterloo Requirement		90.00
West	Percentage	Region of Waterloo Requirement		90.00
South	Percentage	Region of Waterloo Requirement		90.00
East	Percentage	Region of Waterloo Requirement		90.00

Roundabout Slope and Intercept used in model

Leg	Enter slope and intercept directly	Entered slope	Entered intercept (PCE/hr)	Final Slope	Final Intercept (PCE/hr)
North		(calculated)	(calculated)	0.579	1221.701
West		(calculated)	(calculated)	0.579	1221.701
South		(calculated)	(calculated)	0.579	1221.701
East		(calculated)	(calculated)	0.579	1221.701

The slope and intercept shown above include any corrections and adjustments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCE Factor for a Truck (PCE)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	Truck Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Leg	Profile Type	Use Turning Counts	Average Demand Flow (Veh/hr)	Flow Scaling Factor (%)
North	ONE HOUR	✓	35.00	100.000
West	ONE HOUR	✓	727.00	100.000
South	ONE HOUR	✓	417.00	100.000
East	ONE HOUR	✓	371.00	100.000

Turning Proportions

Turning Counts / Proportions (Veh/hr) - Intersection 1 (for whole period)

		To			
		North	**West**	**South**	**East**
From	**North**	0.000	18.000	10.000	7.000
	West	30.000	0.000	465.000	232.000
	South	17.000	318.000	0.000	82.000
	East	11.000	250.000	110.000	0.000

Turning Proportions (Veh) - Intersection 1 (for whole period)

		To			
		North	**West**	**South**	**East**
From	**North**	0.00	0.51	0.29	0.20
	West	0.04	0.00	0.64	0.32
	South	0.04	0.76	0.00	0.20
	East	0.03	0.67	0.30	0.00

Vehicle Mix

Average PCE Per Vehicle - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	1.020	1.020	1.020	1.020
	West	1.020	1.020	1.020	1.020
	South	1.020	1.020	1.020	1.020
	East	1.020	1.020	1.020	1.020

Truck Percentages - Intersection 1 (for whole period)

		To			
		North	West	South	East
From	North	2.0	2.0	2.0	2.0
	West	2.0	2.0	2.0	2.0
	South	2.0	2.0	2.0	2.0
	East	2.0	2.0	2.0	2.0

Results

Results Summary for whole modelled period

Leg	Max V/C Ratio	Max Delay (s)	Max Queue (Veh)	Max 95th percentile Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Intersection Arrivals (Veh)	Total Queueing Delay (Veh-min)	Average Queueing Delay (s)	Rate Of Queueing Delay (Veh-min/min)	Inclusive Total Queueing Delay (Veh-min)	Inclusive Average Queueing Delay (s)
North	0.05	4.95	0.05	~1	A	32.12	48.17	3.63	4.52	0.04	3.63	4.52
West	0.72	11.35	2.48	5.00	B	667.11	1000.66	139.56	8.37	1.55	139.58	8.37
South	0.45	6.35	0.80	1.00	A	382.65	573.97	52.40	5.48	0.58	52.41	5.48
East	0.42	6.47	0.73	1.00	A	340.44	510.65	47.33	5.56	0.53	47.33	5.56

Main Results for each time segment

Main results: (16:00-16:15)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	26.35	6.59	26.23	43.41	507.78	0.00	903.86	366.29	0.029	0.00	0.03	4.102	A
West	547.32	136.83	543.69	438.89	95.12	0.00	1142.69	969.27	0.479	0.00	0.91	5.975	A
South	313.94	78.48	312.31	437.63	201.18	0.00	1081.31	953.18	0.290	0.00	0.41	4.672	A
East	279.31	69.83	277.85	240.16	273.34	0.00	1039.55	731.41	0.269	0.00	0.36	4.718	A

Main results: (16:15-16:30)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	31.46	7.87	31.43	52.03	608.60	0.00	845.51	366.29	0.037	0.03	0.04	4.421	A
West	653.56	163.39	651.82	526.03	114.01	0.00	1131.76	969.27	0.577	0.91	1.34	7.474	A
South	374.87	93.72	374.32	524.64	241.19	0.00	1058.15	953.18	0.354	0.41	0.54	5.259	A
East	333.52	83.38	333.02	287.90	327.61	0.00	1008.14	731.41	0.331	0.36	0.49	5.329	A

Main results: (16:30-16:45)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	38.54	9.63	38.48	63.61	744.81	0.00	766.68	366.29	0.050	0.04	0.05	4.943	A
West	800.44	200.11	796.10	643.76	139.52	0.00	1116.99	969.27	0.717	1.34	2.43	11.067	B
South	459.13	114.78	458.11	641.03	294.60	0.00	1027.24	953.18	0.447	0.54	0.80	6.313	A
East	408.48	102.12	407.54	351.83	400.88	0.00	965.73	731.41	0.423	0.49	0.72	6.439	A

Main results: (16:45-17:00)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	38.54	9.63	38.53	63.85	746.46	0.00	765.73	366.29	0.050	0.05	0.05	4.950	A
West	800.44	200.11	800.25	645.17	139.82	0.00	1116.82	969.27	0.717	2.43	2.48	11.351	B
South	459.13	114.78	459.10	643.97	296.10	0.00	1026.37	953.18	0.447	0.80	0.80	6.345	A
East	408.48	102.12	408.46	353.36	401.85	0.00	965.17	731.41	0.423	0.72	0.73	6.465	A

Main results: (17:00-17:15)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	31.46	7.87	31.52	52.39	611.16	0.00	844.03	366.29	0.037	0.05	0.04	4.430	A
West	653.56	163.39	657.89	528.21	114.47	0.00	1131.50	969.27	0.578	2.48	1.39	7.671	A
South	374.87	93.72	375.87	528.96	243.40	0.00	1056.88	953.18	0.355	0.80	0.55	5.295	A
East	333.52	83.38	334.44	290.16	329.11	0.00	1007.27	731.41	0.331	0.73	0.50	5.357	A

Main results: (17:15-17:30)

Leg	Total Demand (Veh/hr)	Intersection Arrivals (Veh)	Entry Flow (Veh/hr)	Exit Flow (Veh/hr)	Circulating Flow (Veh/hr)	Pedestrian Demand (Ped/hr)	Capacity (Veh/hr)	Saturation Capacity (Veh/hr)	V/C Ratio	Start Queue (Veh)	End Queue (Veh)	Delay (s)	LOS
North	26.35	6.59	26.38	43.78	511.37	0.00	901.79	366.29	0.029	0.04	0.03	4.113	A
West	547.32	136.83	549.17	441.97	95.78	0.00	1142.31	969.27	0.479	1.39	0.93	6.090	A
South	313.94	78.48	314.51	441.76	203.19	0.00	1080.15	953.18	0.291	0.55	0.41	4.706	A
East	279.31	69.83	279.82	242.37	275.32	0.00	1038.40	731.41	0.269	0.50	0.37	4.748	A

Queueing Delay Results for each time segment

Queueing Delay results: (16:00-16:15)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	0.44	0.03	4.102	A	A
West	13.06	0.87	5.975	A	A
South	5.92	0.39	4.672	A	A
East	5.32	0.35	4.718	A	A

Queueing Delay results: (16:15-16:30)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	0.57	0.04	4.421	A	A
West	19.34	1.29	7.474	A	A
South	7.98	0.53	5.259	A	A
East	7.19	0.48	5.329	A	A

Queueing Delay results: (16:30-16:45)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	0.78	0.05	4.943	A	A
West	33.91	2.26	11.067	B	B
South	11.62	0.77	6.313	A	A
East	10.54	0.70	6.439	A	A

Queueing Delay results: (16:45-17:00)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	0.79	0.05	4.950	A	A
West	36.85	2.46	11.351	B	B
South	12.03	0.80	6.345	A	A
East	10.91	0.73	6.465	A	A

Queueing Delay results: (17:00-17:15)

	Queueing Total Delay (Veh-	Queueing Rate Of Delay (Veh-	Average Delay Per Arriving	Unsignalised Level Of	Signalised Level Of

Leg	min)	min/min)	Vehicle (s)	Service	Service
North	0.59	0.04	4.430	A	A
West	21.96	1.46	7.671	A	A
South	8.54	0.57	5.295	A	A
East	7.69	0.51	5.357	A	A

Queueing Delay results: (17:15-17:30)

Leg	Queueing Total Delay (Veh-min)	Queueing Rate Of Delay (Veh-min/min)	Average Delay Per Arriving Vehicle (s)	Unsignalised Level Of Service	Signalised Level Of Service
North	0.46	0.03	4.113	A	A
West	14.45	0.96	6.090	A	A
South	6.32	0.42	4.706	A	A
East	5.67	0.38	4.748	A	A

Queue Variation Results for each time segment

Queue Variation results: (16:00-16:15)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.03	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.91	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.41	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.36	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (16:15-16:30)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.04	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	1.34	0.00	0.00	2.00	3.00			N/A	N/A
South	0.54	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.49	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (16:30-16:45)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.05	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	2.43	0.00	0.00	0.00	5.00			N/A	N/A
South	0.80	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.72	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (16:45-17:00)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.05	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	2.48	?	?	?	?	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
South	0.80	0.00	0.00	0.00	1.00			N/A	N/A

East	0.73	0.00	0.00	0.00	1.00			N/A	N/A

Queue Variation results: (17:00-17:15)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.04	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	1.39	0.00	0.00	2.00	4.00			N/A	N/A
South	0.55	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.50	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Queue Variation results: (17:15-17:30)

Leg	Mean (Veh)	Q05 (Veh)	Q50 (Veh)	Q90 (Veh)	Q95 (Veh)	Percentile Message	Marker Message	Probability Of Reaching Or Exceeding Marker	Probability Of Exactly Reaching Marker
North	0.03	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
West	0.93	0.00	0.00	1.00	2.00			N/A	N/A
South	0.41	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A
East	0.37	~1	~1	~1	~1	Percentiles could not be calculated. This may be because the mean queue is very small or very big.		N/A	N/A

Appendix E

Signal Justification Warrants

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

Horizon Year: 2031
Region/City/Township: Cambridge

Major Street: George Street N
Minor Street: Blair Road

North/South?: N

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

	Major Street						Minor Street						
	George Street N						Blair Road						
	Eastbound			Westbound			Northbound			Southbound			Peds Crossing
Time Period	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	Main Road
AM Peak Hour	0	500	128	17	800	0	362	0	14	0	0	0	0
PM Peak Hour	0	748	408	39	700	0	175	0	13	0	0	0	0
Average Hourly Volume	0	312	134	14	375	0	134	0	7	0	0	0	0

Warrant	AHV
1A - All	976
1B - Minor	141
2A - Major	835
2B - Cross	134

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	976
					% Fulfilled	135.6%

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Minor Street Approaches	180	255	180	255	141
					% Fulfilled	55.3%

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	835
					% Fulfilled	116.0%

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	134
					% Fulfilled	179.0%

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

Horizon Year: 2031
Region/City/Township: Cambridge

Major Street: Roseville Road
Minor Street: Edworthy Side Road
North/South?: N

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

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

	Major Street						Minor Street						
	Roseville Road						Edworthy Side Road						
	Eastbound			Westbound			Northbound			Southbound			Peds Crossing
Time Period	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	Main Road
AM Peak Hour	0	230	186	20	334	0	394	0	15	0	0	0	0
PM Peak Hour	0	329	381	24	286	0	226	0	26	0	0	0	0
Average Hourly Volume	0	140	142	11	155	0	155	0	10	0	0	0	0

Warrant	AHV
1A - All	613
1B - Minor	165
2A - Major	448
2B - Cross	155

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	613
					% Fulfilled	127.7%

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
		X				
	Minor Street Approaches	180	255	180	255	165
					% Fulfilled	91.8%

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	448
					% Fulfilled	93.2%

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	155
					% Fulfilled	310.0%

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

Horizon Year: 2031
Region/City/Township: Cambridge

Major Street: Blenheim Road
Minor Street: Parkwood Drive

North/South?: N

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

	Major Street						Minor Street						
	Blenheim Road						Parkwood Drive						
	Eastbound			Westbound			Northbound			Southbound			Peds Crossing
Time Period	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	Main Road
AM Peak Hour	0	592	132	89	335	0	135	0	259	0	0	0	0
PM Peak Hour	0	468	147	267	642	0	142	0	154	0	0	0	0
Average Hourly Volume	0	265	70	89	244	0	69	0	103	0	0	0	0

Warrant	AHV
1A - All	841
1B - Minor	173
2A - Major	668
2B - Cross	69

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	841
					% Fulfilled	116.7%

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Minor Street Approaches	180	255	180	255	173
					% Fulfilled	67.6%

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	668
					% Fulfilled	92.8%

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	69
					% Fulfilled	92.3%

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

Horizon Year: 2031
Region/City/Township: Cambridge

Major Street: Blenheim Road
Minor Street: Blair Road

North/South?: N

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

	Major Street						Minor Street						
	Blenheim Road						Blair Road						
	Eastbound			Westbound			Northbound			Southbound			Peds Crossing
Time Period	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	Main Road
AM Peak Hour	330	603	0	0	262	8	0	0	0	51	0	189	0
PM Peak Hour	227	455	0	0	631	31	0	0	0	45	0	381	0
Average Hourly Volume	139	265	0	0	223	10	0	0	0	24	0	143	0

Warrant	AHV
1A - All	803
1B - Minor	167
2A - Major	637
2B - Cross	24

Warrant 1 - Minimum Vehicular Volume

	Approach Lanes	1		2 or more		Average Hourly Volume
1A	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	All Approaches	480	720	600	900	803
					% Fulfilled	111.6%

	Approach Lanes	1		2 or more		Average Hourly Volume
1B	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Minor Street Approaches	180	255	180	255	167
					% Fulfilled	65.3%

Warrant 2 - Delay To Cross Traffic

	Approach Lanes	1		2 or more		Average Hourly Volume
2A	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Major Street Approaches	480	720	600	900	637
					% Fulfilled	88.4%

	Approach Lanes	1		2 or more		Average Hourly Volume
2B	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Traffic Crossing Major Street	50	75	50	75	24
					% Fulfilled	32.0%

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

Horizon Year: 2031
Region/City/Township: Cambridge

Major Street: George Street N
Minor Street: Blair Road

North/South?: Y

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	Yes	Justification for existing intersections with forecast traffic

	Major Street						Minor Street						
	George Street N						Blair Road						
	Northbound			Southbound			Eastbound			Westbound			Peds Crossing
Time Period	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right	Main Road
AM Peak Hour	73	256	2	14	223	86	191	122	352	3	135	113	0
PM Peak Hour	156	204	5	11	391	205	138	97	257	5	308	131	0
Average Hourly Volume	57	115	2	6	154	73	82	55	152	2	111	61	0

Warrant	AHV
1A - All	870
1B - Minor	463
2A - Major	407
2B - Cross	195

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	870
					% Fulfilled	120.8%

1B	Approach Lanes	1		2 or more		Average Hourly Volume
	Flow Conditions	Free	Restricted	Free	Restricted	
			X			
	Minor Street Approaches	120	170	120	170	463
					% Fulfilled	272.4%

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	407
					% Fulfilled	56.5%

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	195
					% Fulfilled	260.0%