

GLOUCESTER COSTCO BUSINESS CENTRE GAS BAR ADDITION TRAFFIC IMPACT ASSESSMENT

Gloucester, ON

October 2025



Gloucester Costco Business Centre Gas Bar Addition Traffic Impact Assessment Report

Gloucester, ON

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Section 1

Screening Form & Scoping

SCOPING & FORECASTING

Kittelson Canada, LLC (Kittelson) has prepared this report to satisfy the traffic impact assessment report requirement for the proposed gas bar addition (Project) at the existing Costco Business Centre located at 1900 Cyrville Road. The project team has confirmed with the Ministry of Transportation Ontario (MTO) that this project does not fall within the MTO's permit control area. As such, the materials presented in this report have been coordinated exclusively with the City of Ottawa.

1.0 TIA SCREENING FORM

Kittelson completed a TIA screening form and determined the project satisfies the trip generation and safety triggers as included in **Appendix A**. The trip generation trigger was met based on the Project's proposed number of trips generated; the location trigger was not met; the safety trigger was met based the proposed driveway location within the area of influence of a traffic signal and the Project's drive through facility.

2.1 EXISTING & PLANNED CONDITIONS

The elements of this section characterize the site conditions, proposed development plan, existing conditions, and planned conditions associated with the implementation of the Project.

2.1.1 Proposed Development

Costco Wholesale Canada LTD (Costco) is proposing to construct a new gas bar addition with 24 fueling positions in the northeast corner of the existing Costco Business Centre located at 1900 Cyrville Road in Ottawa, Ontario. The gas bar addition will be contained on the existing Costco Business Centre parcel and proposes no change to the existing by-law 2008-250 as zoning GM12 (General Mixed Use).

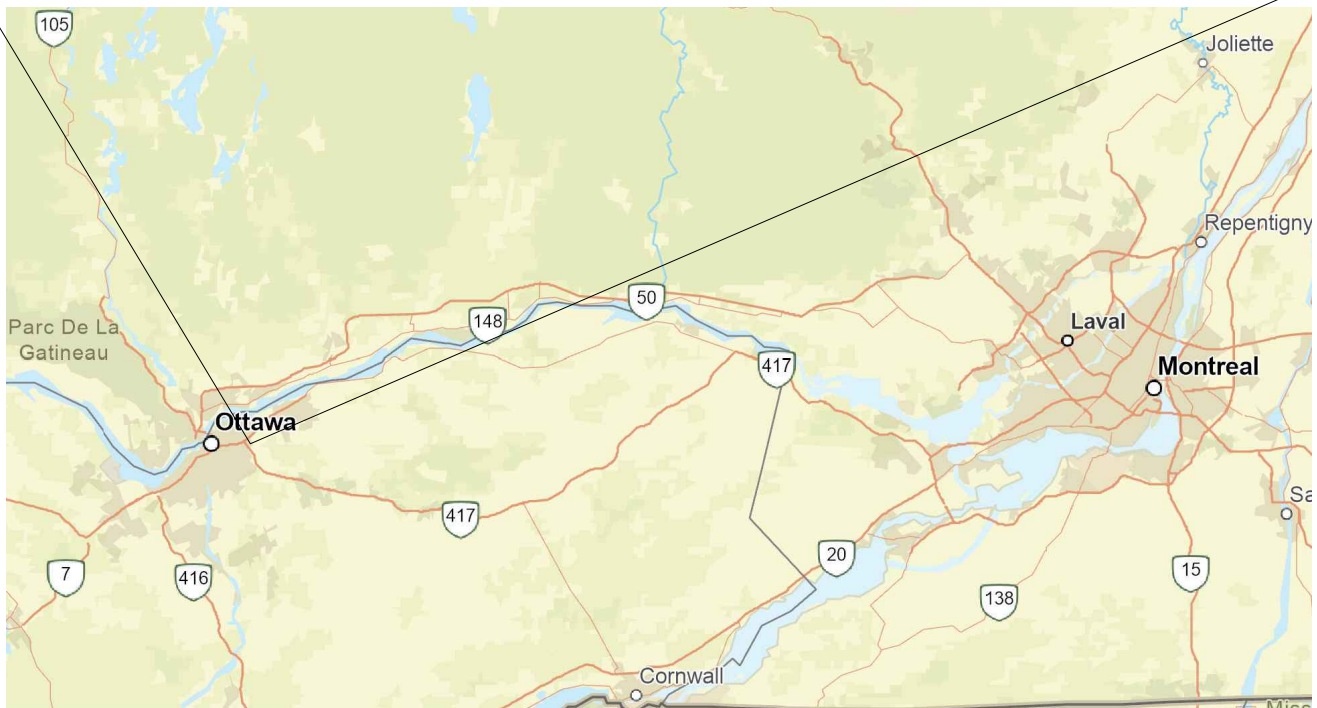
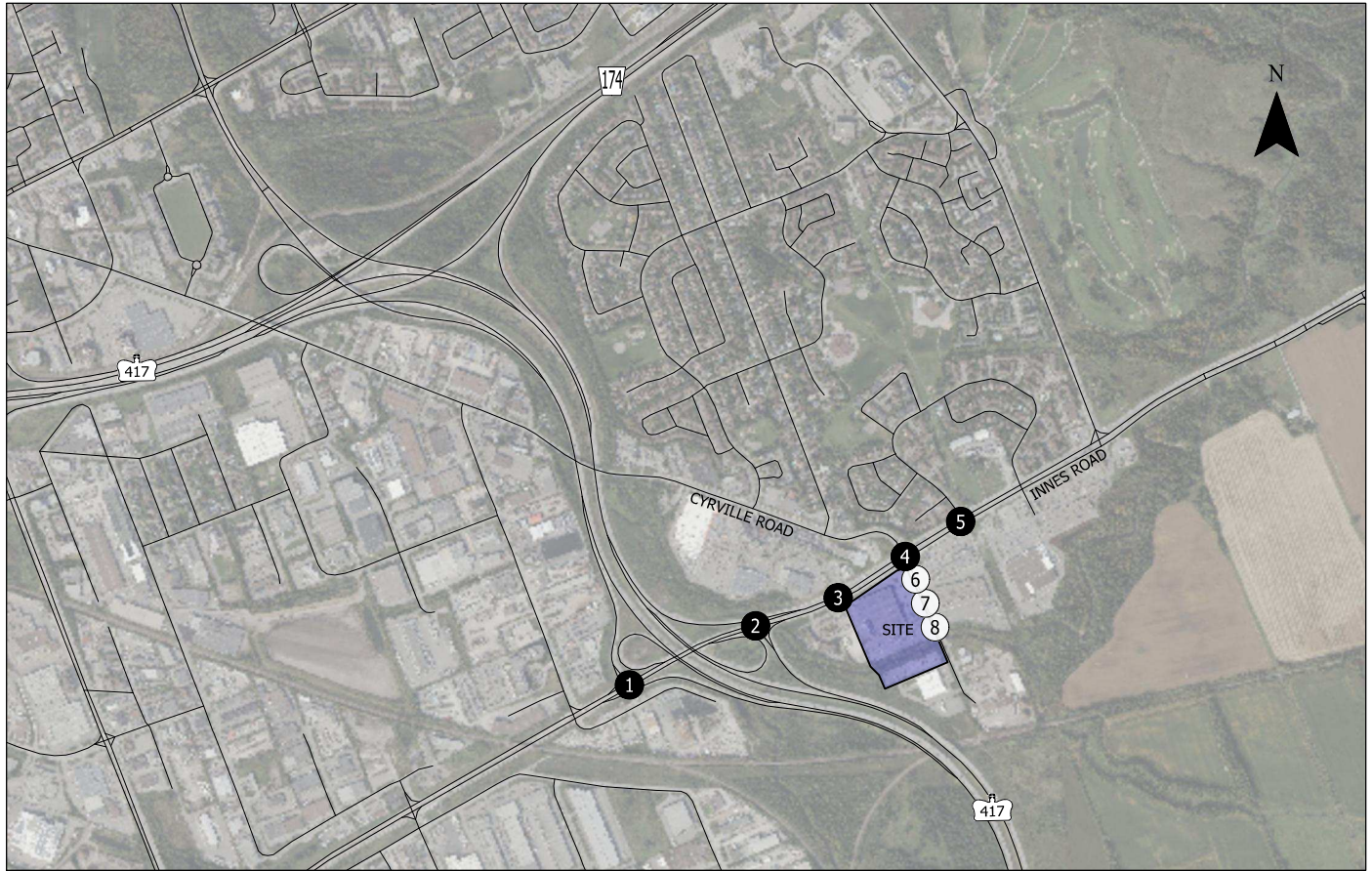
The proposed build-out for the gas bar addition is to be constructed in a single phase and completed in year 2027. To accommodate the gas bar on the existing site the Project is proposing to remove a total of 125 parking stalls (2 loading stalls, and 123 standard parking stalls) while maintaining the existing accessible and delivery stalls. The resulting number of parking spaces is expected to be 478, which should be sufficient based on current parking utilization observed on the site. The final number of spaces will be finalized through the SPA process and on-going coordination with the City regarding a right-of-way taking per the City's "1900 Cyrville Road" plan. No new parking stalls are proposed to be provided.

Access to the gas bar addition is proposed from the following locations:

- A. Costco Business Centre N Driveway / Cyrville Road (Full Movement, Future)
 - a. This is a future relocation of the existing Costco Business Centre N Driveway currently restricted to right-in, right-out (RIRO).
- B. Costco Business Centre Central Driveway / Cyrville Road (Full Movement, Existing)

Figure 1 includes a site vicinity map. **Figure 2** includes the current draft conceptual¹ site plan.

¹ The site plan depicted is conceptual. Additional, minor modifications are still being incorporated with respect to a small section of sidewalk along Cyrville Road. These minor adjustments are the only item still under review.



- - Study Intersection
- - Study Site Access

Site Vicinity Map
Ottawa, Ontario

Figure
1

2.1.2 Existing Conditions

This section identifies the site conditions and current geometric characteristics of the roadways within the study area. Information regarding site conditions, adjacent land uses, existing traffic operations, and transportation facilities in the study area were reviewed.

SITE CONDITIONS & ADJACENT LAND USES

The existing Costco Business Centre has three driveways on Cyrville Road. The northern access (intersection 6, approximately 55 metres south of Innes Road) is currently restricted to right-in movements by a raised median on Cyrville Road. The other two driveways provide full access – one located approximately 190 metres south of Cyrville Road (intersection 8), and the southernmost (serving the parking area south of the creek) approximately 300 metres south of Cyrville Road. Along Cyrville Road there are private driveways that provide direct access to the Innes Plaza retail center and the Dufresne Furniture Store. Ottawa Fire Station No. 36 is just south of the southern-most Costco Business Centre parking area. **Figure 3** shows the existing access configuration for the Costco along Cyrville Road.

TRANSPORTATION FACILITIES

The transportation system inventory identifies the current characteristics of roadways within the study area. Major roadways within the study area were identified and catalogued, including transit facilities and pedestrian and bicycle infrastructure.

ROADWAY FACILITIES

Innes Road is a City-owned east-west arterial roadway with a six-lane divided cross-section within the study area. It has a posted speed limit is 60 km/h with auxiliary turn lanes provided at major intersections.

Cyrville Road is a City-owned north-south collector street in the vicinity of the site. It has a posted speed limit is 50 km/h with auxiliary turn lanes provided at Innes Road.

Table 1 provides a summary of the existing roadway facilities proposed to be included in the study within the site vicinity.

Table 1. Existing Study Transportation Facilities and Roadways

Roadway	Jurisdiction	Functional Classification	Number of Travel Lanes	ROW Protection	Posted Speed (KPH)	Sidewalks	Bicycle Lanes	On-Street Parking
Highway 417	Province	Highway	Six	-	110	No	No	No
Innes Road	City of Ottawa	Arterial	Six	44.5 to 94.6 ¹	60	Yes	Yes	No
Cyrville Road	City of Ottawa	Collector	Two	37.5 ²	50	Partial ³	Partial ⁴	No
Stonehenge Crescent	City of Ottawa	Local	Two	-	40	Partial ⁵	No	No

¹Varies and subject to unequal widening requirements of Hospital Link and Cumberland Transitway Westerly EA per Schedule C16 of City of Ottawa Official Plan.

²Protected ROW reported for Cyrville Road between 100 m north of Maxime and Innes Road, no Protected ROW provided south of Innes Road per Schedule C16 of City of Ottawa Official Plan.

³Sidewalks are present on both sides of Cyrville Road north of the Innes Road / Cyrville Road intersection and on the south side only to the first private driveways on either side. The sidewalk on the western side provides pedestrian access to the Costco Business Centre to Innes Road.

⁴Bicycle lanes are present on both sides of Cyrville Road to the north of the Innes Road / Cyrville Road intersection and not provided on the south side of the intersection. ⁵ Sidewalks provided only on the W side of Stonehenge Crescent north of Innes Road.

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- - Study Intersection
- - Study Site Access

NOT TO SCALE

Existing Costco Business Centre
Access Configuration
Ottawa, Ontario

Figure
3

PEDESTRIAN & BICYCLE FACILITIES

Within the project vicinity, sidewalks are provided along both sides of Innes Road. Along Cyrville Road, sidewalks are provided on both sides of the corridor north of the Innes Road / Cyrville Road intersection, and south of the intersection sidewalks are only provided to the first private driveways on either side.

Dedicated bike lane facilities are provided along both sides of Innes Road, where all bike lanes are at grade striped facilities except for the eastbound bike lane on the east leg of the intersection which is a raised bike lane facility. Bike lane facilities are provided on both sides of Cyrville Road north of the Innes Road / Cyrville Road intersection, and no bike lane facilities are provided south of the Innes Road / Cyrville Road intersection. Further, Cyrville Road north of Innes Road and Innes Road east of Cyrville Road are part of Ottawa's Crosstown Bikeways Network.

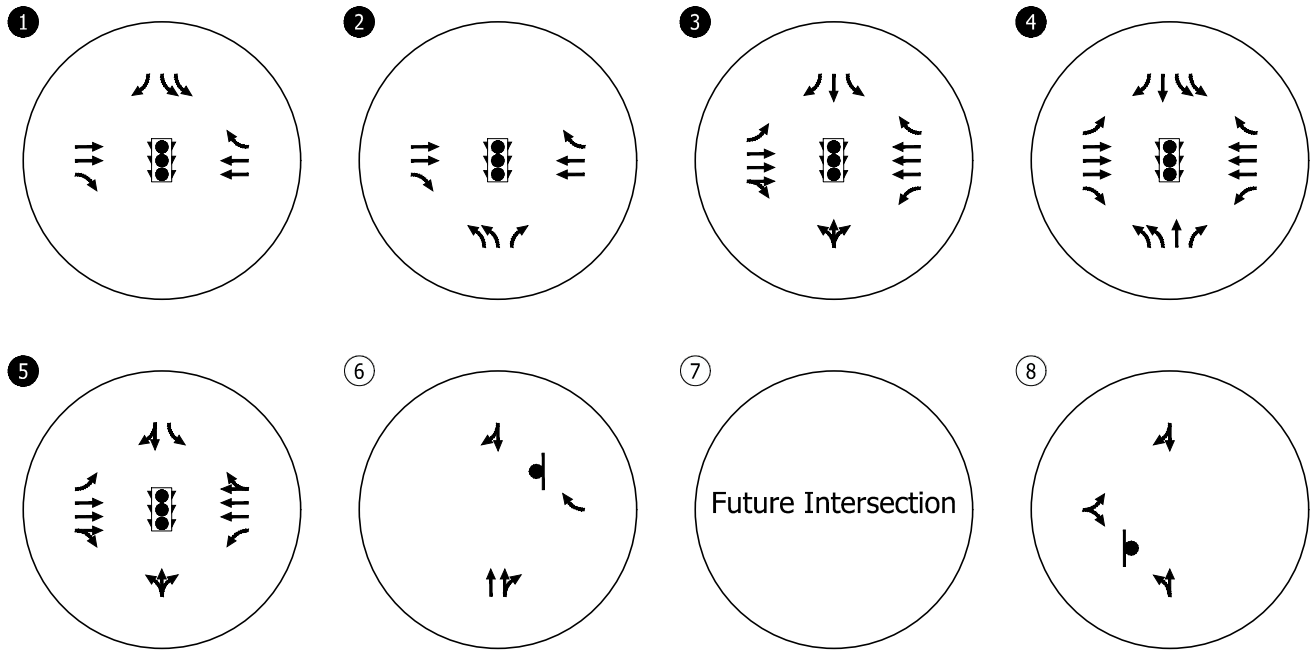
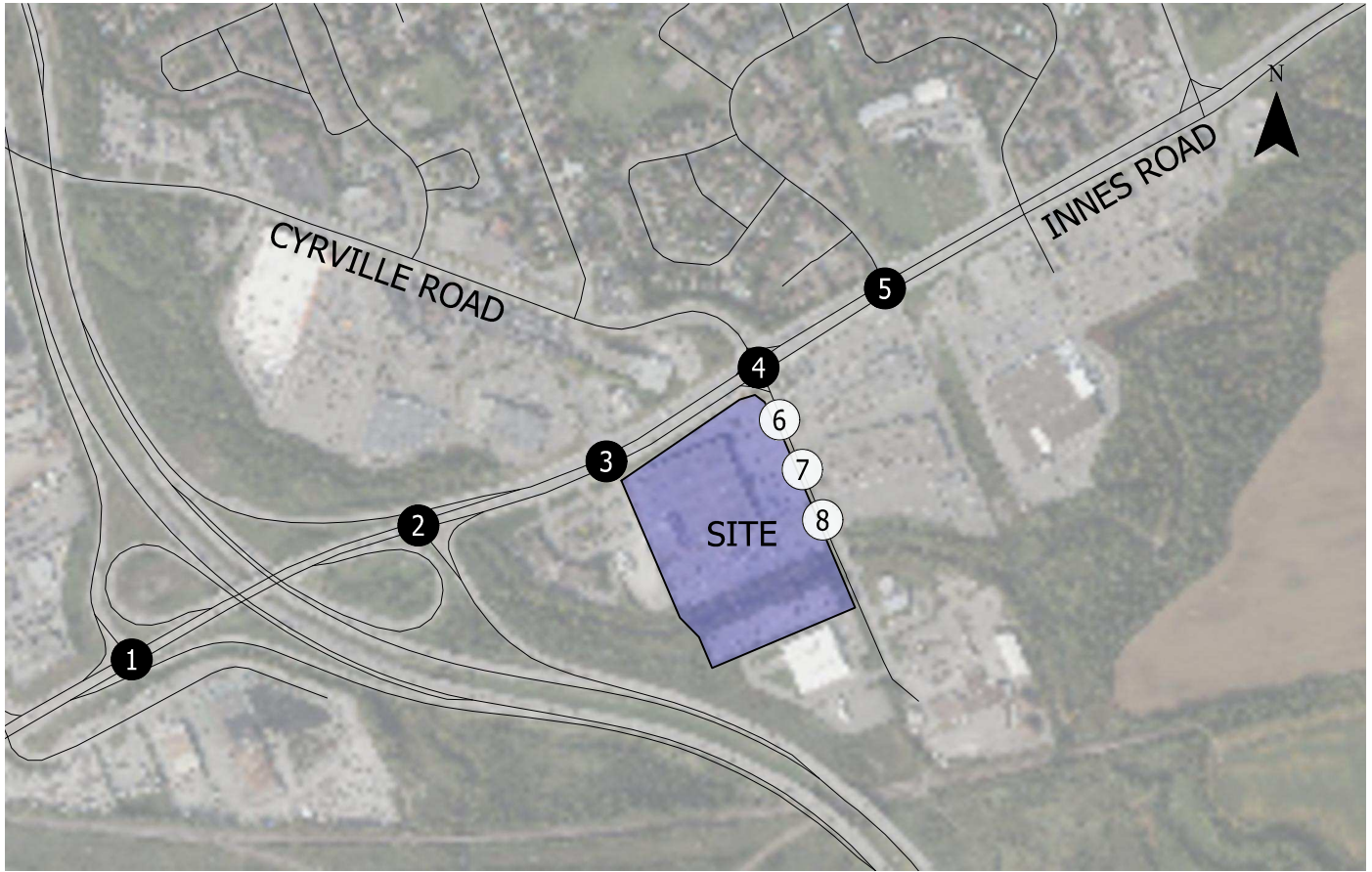
TRANSIT FACILITIES

OC Transpo provides transit services across Ottawa, including train and bus services. Within the study area transit facilities provided include an existing bus stop provided in the eastbound direction on the east leg of the Innes Road / Cyrville Road. Bus routes through this stop include local routes 26 and 42. A bus stop is also provided in each direction on the north leg of the Innes Road / Cyrville Road intersection served by local routes 26 and 42.

EXISTING TRAFFIC CONDITIONS & VOLUMES

Peak hour turning movement counts were collected for the Gloucester Costco Business Centre gas bar addition in June 2025 during the weekday AM (7:00 AM – 9:00 AM), weekday PM (4:00 PM – 6:00 PM), and Saturday midday (11:00 AM – 2:00 PM) peak periods. The peak hour intersection turning movement counts included total vehicle volumes by movement, calculated heavy vehicle percentages, as well as pedestrian and bicycle volumes recorded in 15-minute intervals. **Appendix B** contains the traffic count data.

Figure 4 includes the existing lane configuration and traffic control devices at the proposed study intersections. **Figure 5** includes the existing, balanced vehicle traffic volumes at the proposed study intersections. **Figure 6** includes the existing pedestrian traffic volumes at the proposed study intersections.

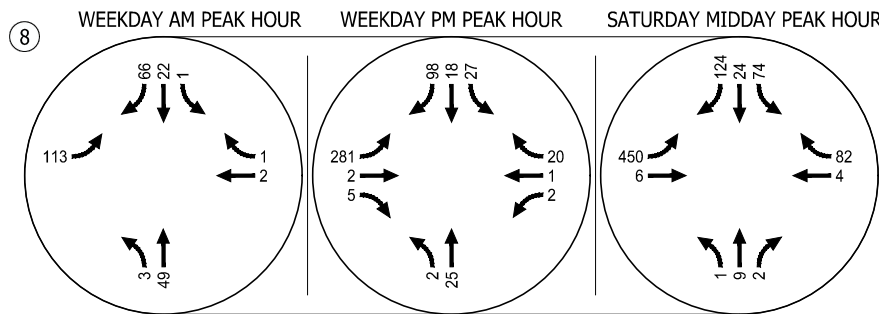
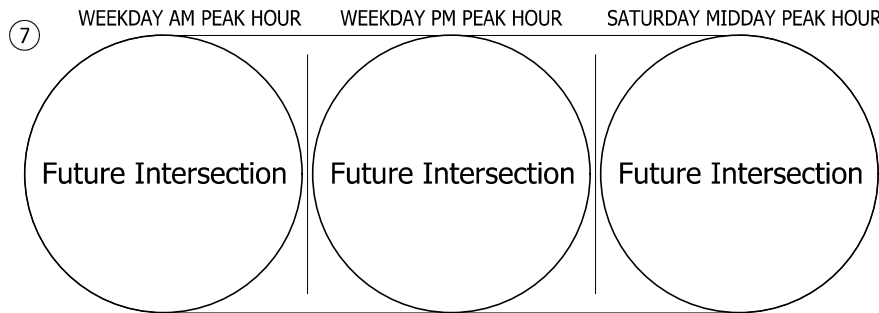
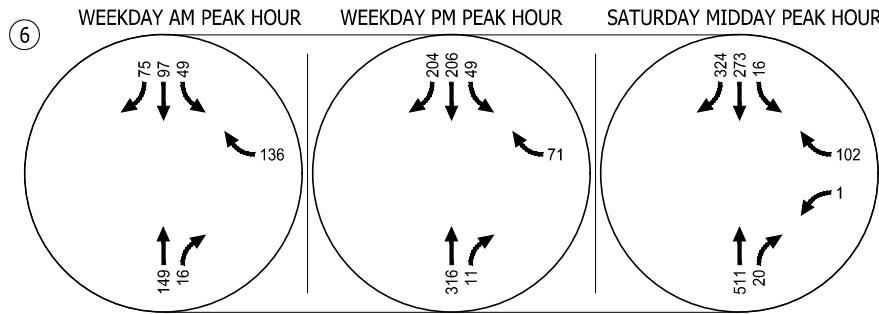
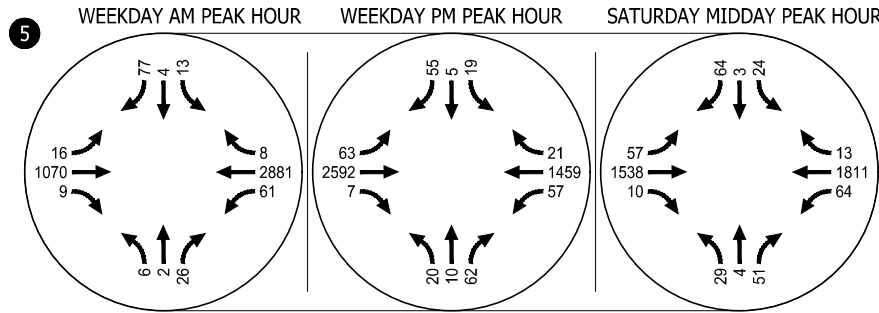
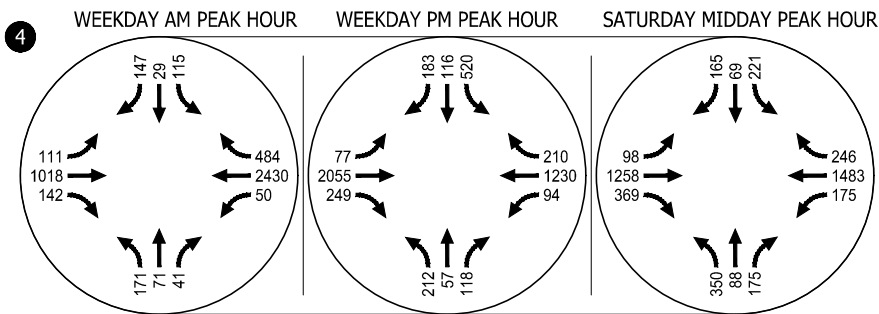
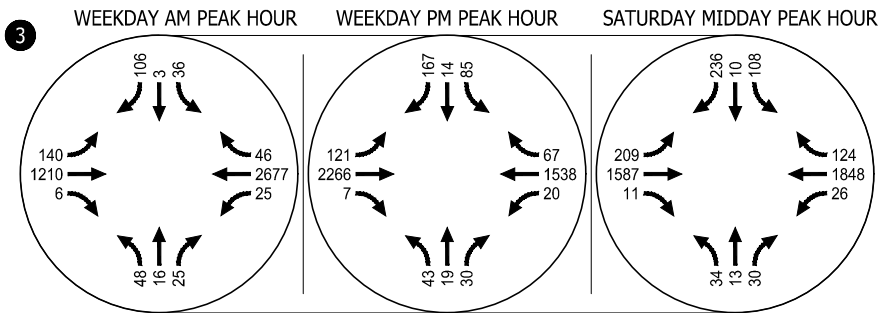
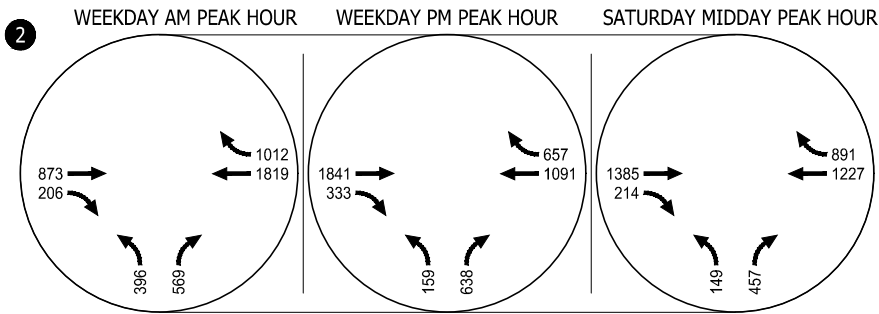
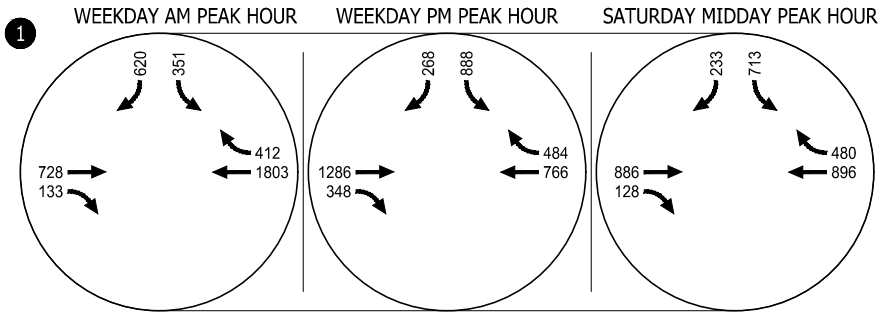
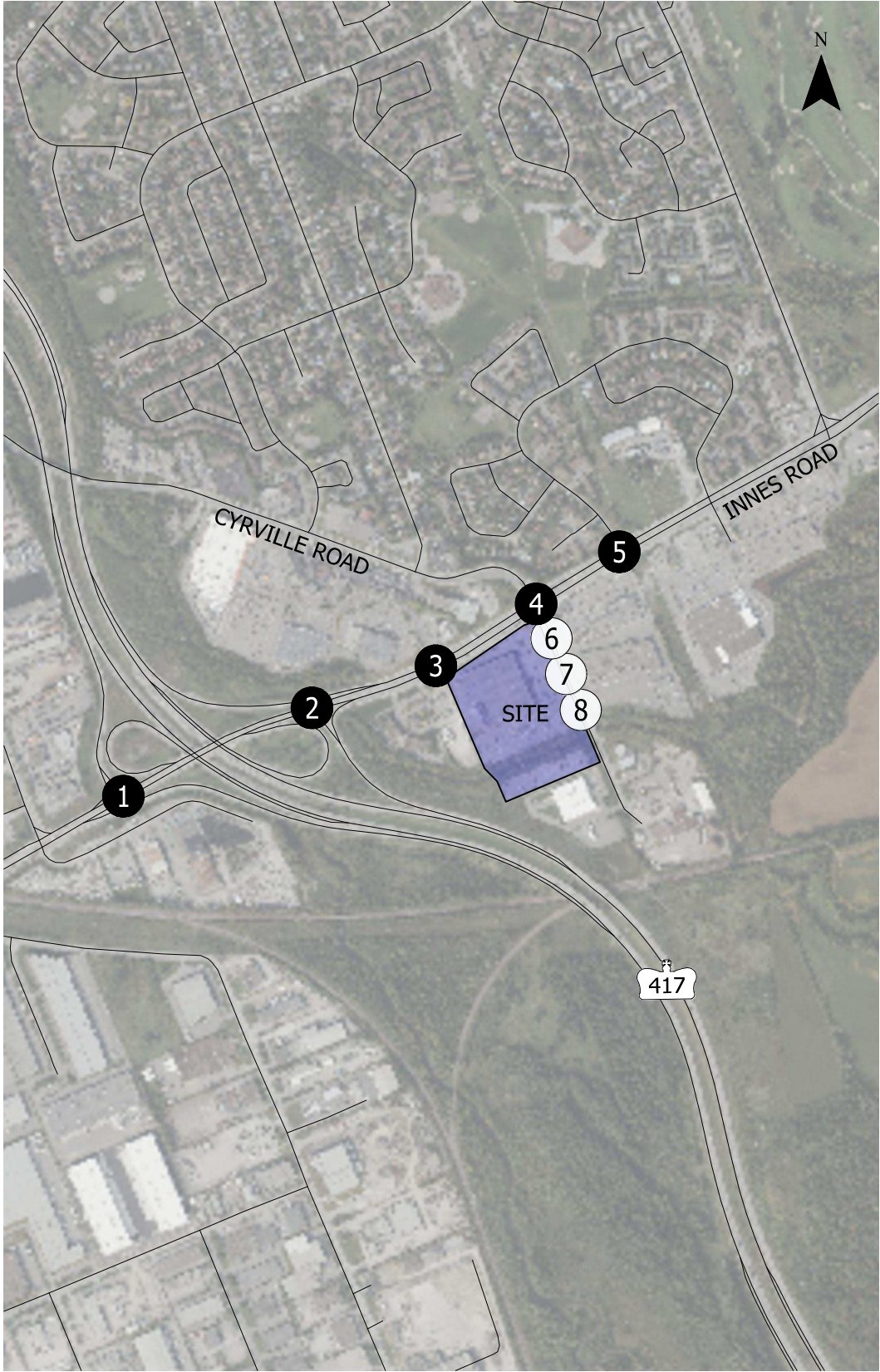


- - Study Intersection
- - Study Site Access
- 🚦 - Traffic Signal
- 🛑 - Stop Sign

Existing Lane Configurations
& Traffic Control Devices
Ottawa, Ontario

Figure
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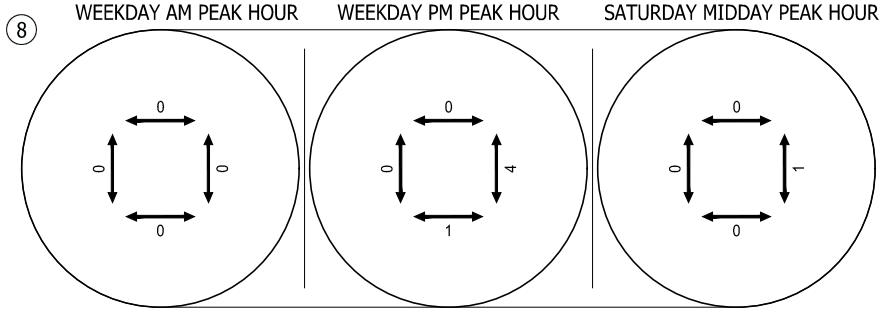
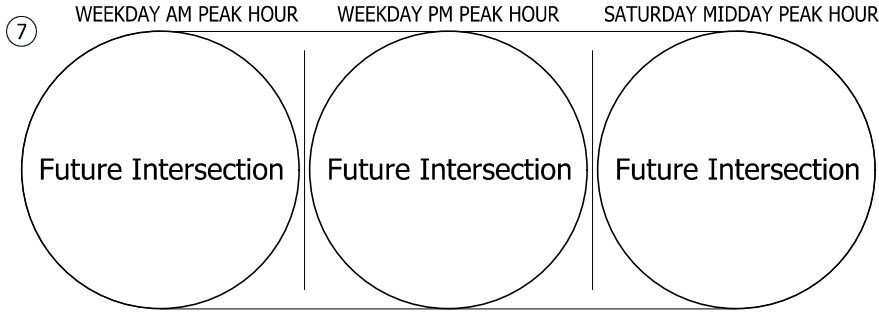
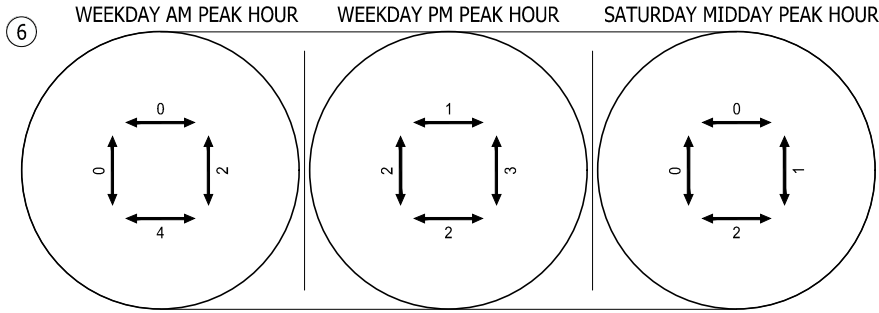
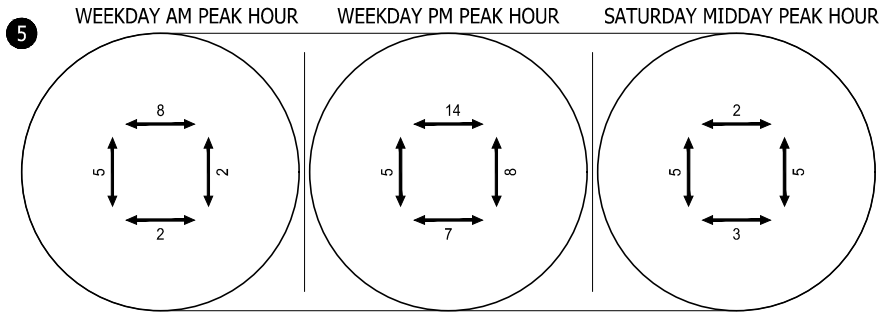
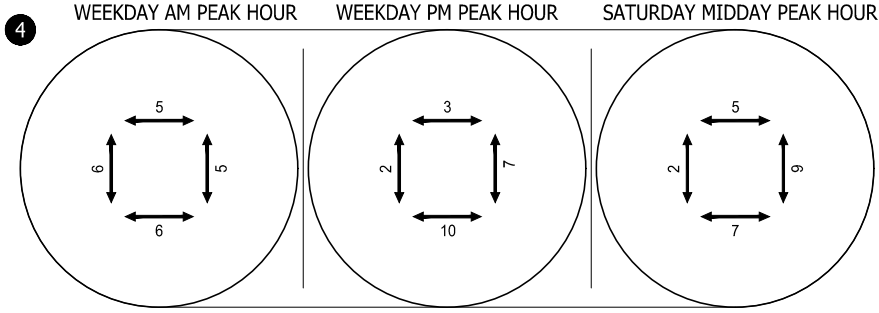
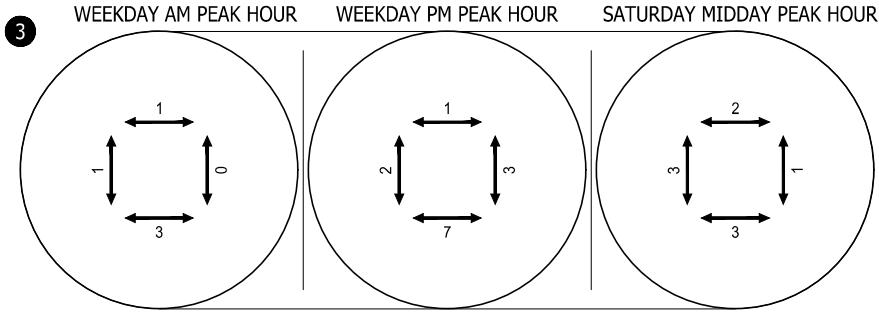
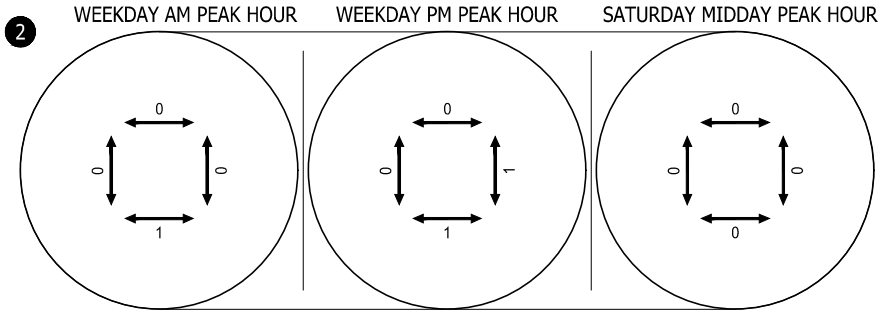
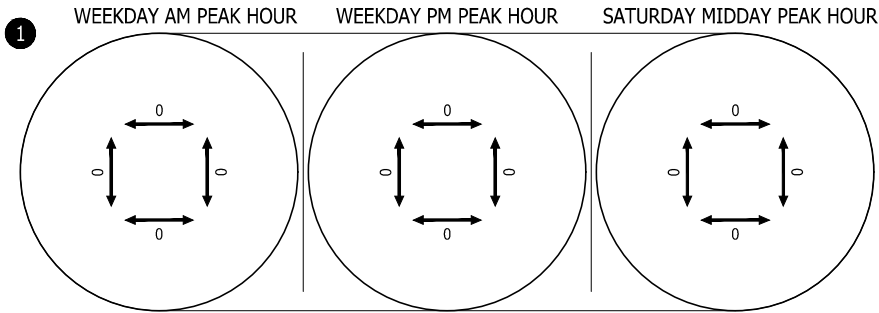
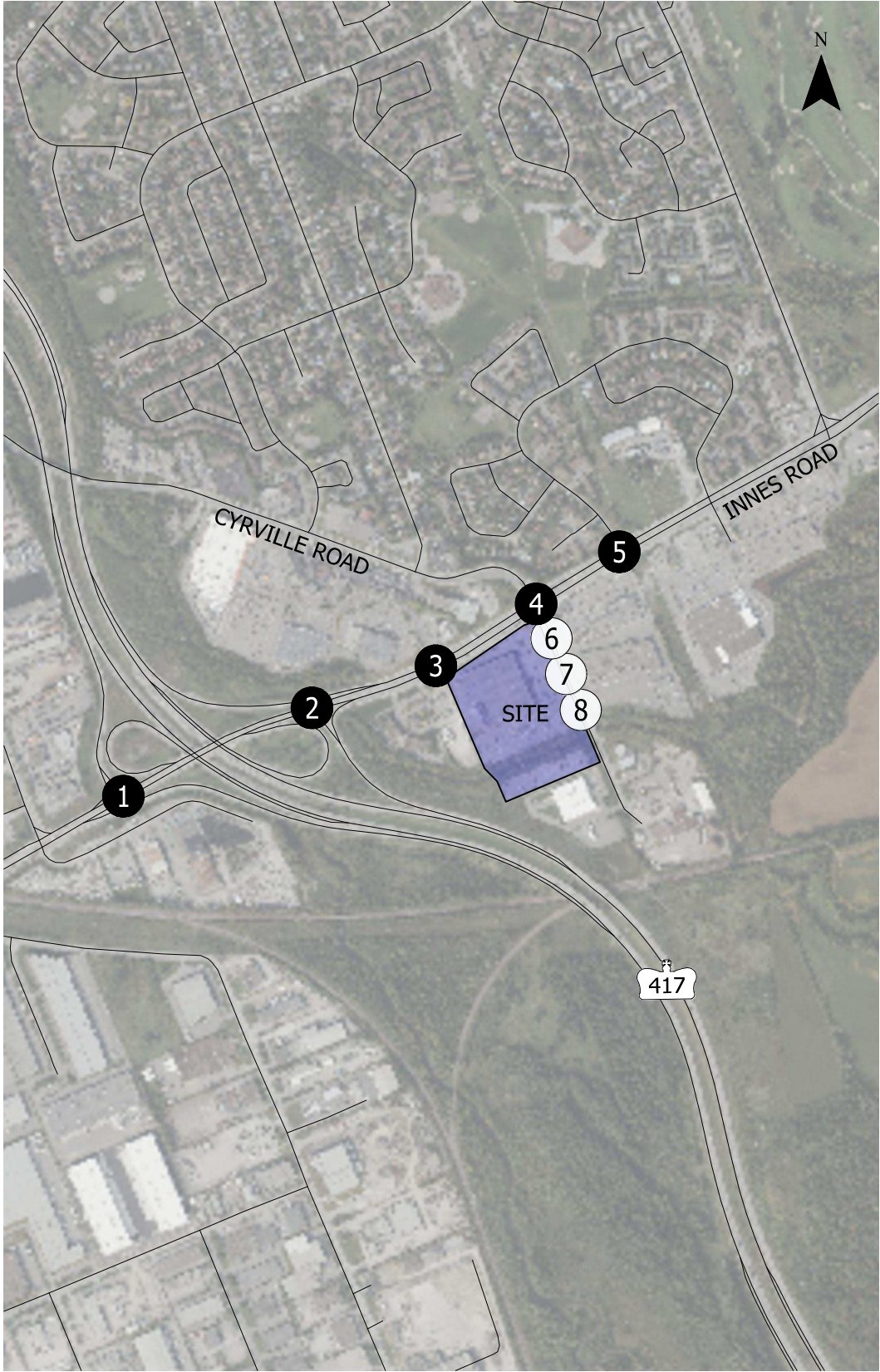


- Study Intersection
- Study Site Access

Year 2025 Existing Vehicle Traffic Volumes
Weekday AM, Weekday PM, Saturday Midday Peak Hours
Ottawa, Ontario

Figure 5

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- Study Intersection
- Study Site Access

Year 2025 Existing Pedestrian Traffic Volumes
Weekday AM, Weekday PM, Saturday Midday Peak Hours
Ottawa, Ontario

Figure
6

CRASH HISTORY

Crash data for the proposed study intersections was provided by the City of Ottawa for the previous five (5) years on record for which data was available (2018 – 2022). This data was used to evaluate and document any crash trends occurring at proposed study intersections. **Table 2** presents the number of crashes, by crash type and severity, at each study intersection. **Appendix C** includes the crash data provided by the City of Ottawa.

Table 2. Study Intersection Crash Type & Severity Summary, 2018 – 2022

Intersection	Crash Type						Total	Severity		
	Rear-End	SMV ¹ Other	Turning	Side Swipe	Angle	Other		PDO ²	Injury	Fatality
Intersection										
Innes Road / Highway 417 SB Ramp	14	2	-	8	10	-	34	28	6	-
Innes Road / Highway 417 NB Ramp	15	2	-	7	5	-	29	25	4	-
Innes Road / Innes Crossing	8	2	2	3	1	-	16	12	4	-
Innes Road / Cyrville Road	61	4	7	25	17	3	117	94	21	-
Innes Road / Stonehenge Crescent	10	3	2	4	6	-	25	15	10	-
Segment										
Cyrville Road S of Innes Road	-	2	-	-	-	-	2	1	-	1

¹ SMV = single motor vehicle

² PDO = property damage only

As shown in **Table 2**, the most common crash types in the study area were rear-end and side swipe crashes, and most of the crashes resulted in property damage only. The number of crashes at each intersection in the study area indicates the presence of a trend at each location as more than six (6) collisions occurred over five (5) years.

At the intersections of Innes Road and the Highway 417 Northbound and Southbound Ramps the most common crash types were rear-end and angle crashes. At the interchange, between 2018 and 2022 both intersections there were a total of 63 crashes – 34 occurring at the southbound ramp and 29 occurring at the northbound ramp – where 53 resulted in property damage only and ten (10) resulted in a non-fatal

injury. The rear-end crashes occurring at the interchange typically occurred under clear conditions between two vehicles where one was stopped or slowing.

The intersection of Innes Road / Innes Crossing experienced most commonly rear-end crashes. Between 2018 and 2022 this intersection experienced a total of 16 crashes, where 12 resulted in property damage only and four (4) resulted in a non-fatal injury. The rear-end crashes occurring at this location typically occurred under clear conditions between two (2) vehicles where one was stopped or slowing. Further, at this location there was one (1) crash that occurred involving a pedestrian where a slow-moving vehicle traveling southbound making a left-turn under clear conditions resulted in a non-fatal injury.

The intersection that experienced the most crashes was Innes Road / Cyrville Road where the common crash types were rear-end and side swipe crashes. At this intersection, between 2018 and 2022 there were a total of 117 crashes, where 94 of the crashes resulted in property damage only, 21 of the crashes resulted in a non-fatal injury, and no crashes resulted in a fatality. The rear-end crashes occurring at this location typically occurred under daylight conditions between two (2) vehicles where the first vehicle was traveling eastbound or westbound and slowed or stopped into the second vehicle. The side swipe crashes occurring at this intersection typically occurred under daylight conditions between two (2) vehicles traveling in the same direction, primarily eastbound or westbound, where one vehicle was attempting to change lanes. In addition to the most common rear-end and side swipe crashes at the intersection of Innes Road / Cyrville Road there were three (3) crashes that involved a single vehicle and a pedestrian. All three (3) pedestrian crashes resulted in a non-fatal injury between a vehicle traveling eastbound (2) and a vehicle making a northbound right-turn (1) under either dark or freezing rain conditions.

The intersection of Innes Road / Stonehenge Crescent most commonly experienced rear-end crashes. Between 2018 and 2022 this intersection experienced a total of 25 crashes, where 15 resulted in property damage only and ten (10) resulted in a non-fatal injury. The rear-end crashes occurring at this location typically occurred under clear conditions between two (2) vehicles stopping or slowing. Further, at this location there was one (1) crash that occurred involving a pedestrian where a slow-moving vehicle traveling southbound making a left-turn under clear conditions resulted in a non-fatal injury.

South of Innes Road, along Cyrville road only two (2) crashes occurred between 2018 and 2022, both involving a slow-moving object. One of these crashes resulted in property damage only, while the other resulted in the fatality of a pedestrian. The fatal crash occurred between an open truck moving slowly in the northbound direction and a pedestrian under dry conditions in August 2019.

2.1.3 Planned Conditions

A review of planned and proposed changes to the study area transportation network was conducted.

PLANNED INTERSECTION & ROADWAY IMPROVEMENTS

Based on a review of the City of Ottawa's Transportation Master Plan (TMP), and Cycling Plan the following improvements are planned in the area:

CITY OF OTTAWA TRANSPORTATION MASTER PLAN

The City of Ottawa's current 2025 Transportation Master Plan (TMP) was reviewed to identify any roadway projects in the study area.

Roadway

The 2025 TMP identifies the following efforts to completed in support of year 2046 conditions:

- Needs-Based Road Network Projects
 - Blackburn Hamlet Bypass Widening (Navan Road to Innes Road): Roadway widening
 - Eastern Connectivity in the Innes-Walkley Area: Update to new four-lane road between Innes Road and Walkley Road.
- Priority Road Network Projects
 - Phase 2 Capacity Projects
 - Eastern Connectivity in the Innes-Walkley Area: Update to new four-lane road between Innes Road and Walkley Road.

Innes Road along the site frontage is included in the Brian Coburn Boulevard Extension/Cumberland Transitway Environmental Assessment Study².

Resurfacing of Cyrville Road south of Innes Road is planned in 2027. The applicant acknowledges that coordination with the construction of the proposed new access will be required.

Pedestrian & Bicycle

The TMP Pedestrian and Cycling Project List was approved by City Council in 2023. It includes:

- A cycling feasibility project on Innes Road from Star Top Road to Cyrville Road, the Prescott-Russell Recreational Trail terminating at Innes Road east of the site.
- Bike lanes on Meadowbrook Road between Cyrville Road and Telesat Court.

Additionally, the 2025 TMP identifies:

- Cyrville Road north of Innes Road and Innes Road east of Cyrville Road are both designated as Cross-Town Bikeways.
- Innes Road over Highway 417 for a feasibility study focused on improving pedestrian and cycling facilities to avoid the overpass, between Startop Road and Cyrville Road.
- Meadowbrook Road for at grade bike lanes, installed through pavement markings and signage, where feasible from Cyrville Road to Telesat Court.
- Prescott-Russell Recreational Trail for bike lane connections to Cyrville Road through infrastructure improvements.

Transit

The Rapid Transit and Transit Priority (RTTP) Network identifies 2031 Affordable Network and 2031 Network Concepts. The RTTP 2031 Affordable Network identifies Blair Road and Innes Road east of Blair Road as Transit Priority Corridors with isolated measures. The RTTP 2031 Network Concepts identifies Innes Road /

² Morrison Hershfield. *Brian Coburn Boulevard Extension/Cumberland Transitway (Navan Road to Blair Road at Innes Road) Environmental Assessment Study*. February 2024.

https://documents.ottawa.ca/sites/default/files/brian_coburn_esr_en.pdf

Blair Road from Millennium Station to Blair Station for transit signal priority and queue jump lanes at select intersections.

Construction of a transit priority corridor on Innes Road east of Blair Road is planned for completion in 2027 and will include roadway widening for Transit/HOV and transit queue jump lanes.

The 2025 TMP Transit Network identifies Blair Road (between Blair Station and Cumberland Transitway) as a completed project to provide continuous bus lanes in the priority transit network. As an identified priority transit network project, the Blair Road project aims to improve traveling speeds and reliability by connecting communities to the Transitway network. In contrast, projects identified in the Needs-Based network are expected to pair with transit services.

CITY OF OTTAWA CYCLING PLAN & PEDESTRIAN PLAN

The City of Ottawa 2013 Cycling Plan identifies a feasibility study project to evaluate improving pedestrian and bicycle facilities such that they avoid the Highway 417 interchange along Innes Road between Startop Road and Cyrville Road.

IN-PROCESS DEVELOPMENTS

In addition to the identified planned improvements in the study area and proposed annual growth rate, the following developments were identified in the study area:

- Application #D07-12-14-020 (1599 St Laurent Boulevard): A post approval application that includes a Site Plan Control application for the development of a new truck terminal proposed to include a single story warehouse with loading bays.
- Application #D07-12-16-0071 (2012 Ogilvie Road): A post approval application that includes a property revision to a previously approved development plan with the intention of adding a warehouse club retail store and gas bar.

Both of the identified post approval applications are located further than one (1) kilometre away from the proposed Gloucester Costco Business Centre gas bar addition. As such, these identified applications are not included as in-process, vested trips in the development of future year 2027 build out conditions.

2.2 STUDY AREA & TIME PERIODS

This section identifies study area and study scenario characteristics.

2.2.1 Study Area

Based on the ancillary nature of Costco gas bars to Business Centres and the anticipated trip generation, the following study intersections are proposed:

1. Innes Road / Highway 417 SB Ramp
2. Innes Road / Highway 417 NB Ramp
3. Innes Road / Innes Crossing
4. Innes Road / Cyrville Road
5. Innes Road / Stonehenge Crescent

- A. Costco Business Centre N Driveway / Cyrville Road (Right-In Restricted, Existing)
 - a. This access is currently right-in restricted and will be closed as part of this Project.
- B. Costco Business Centre New Driveway / Cyrville Road (Full Movement, Future)
 - a. This is a future driveway to be constructed as part of this Project.
- C. Costco Business Centre Central Driveway / Cyrville Road (Full Movement, Existing)

2.2.2 Study Time Periods

The proposed study time periods for analysis are as follows:

- Weekday AM Peak Hour (7:00 AM – 9:00 AM)
- Weekday PM Peak Hour (4:00 PM – 6:00 PM)
- Saturday Midday Peak Hour (11:00 AM – 2:00 PM)
 - Given the nature of Costco operations, the Saturday midday peak hour has been identified as critical peak hour to be included in analysis.

2.2.3 Horizon Years

An evaluation of the impact of traffic generated by the Project during the weekday AM, weekday PM, and Saturday midday peak hours is proposed as follows:

- Transportation improvements planned in the site vicinity were identified.
- Background peak hour conditions for year 2027 are to be developed by applying the identified annual growth rate on roadways, excluding the southern leg of the Innes Road / Cyrville Road intersection where no potential growth is identified.
- Background peak hour conditions for build-out year 2027 are to be analyzed at the identified study intersections.
- Site-generated trips are to be estimated for the build-out of the Project.
- Site trip distribution patterns are to be estimated for the site-generated trips based on the existing traffic patterns and the major trip origins and destinations in the City of Ottawa.
- The build-out year 2027 total traffic conditions are to be analyzed at each identified study intersection and site access point during the peak hours.
- Post build-out year 2032 (build out + five (5) years) background peak hour conditions are to be analyzed at the identified study intersections.
- Post build-out year 2032 (build out + five (5) years) total traffic conditions are to be analyzed at each identified intersection and site access point during the peak hours.

2.3 EXEMPTION REVIEW

Based on the proposed development and the review of potential analysis exemptions set forth in the TIA Guidelines, the following elements summarized in **Table 3** are exempted from this TIA.

Table 3. Exemption Review Summary

Module	Element	Exemption Notes
4.1 Development Design	4.1.3 New Street Networks	Not required for applications involving a site plan.

4.2 Parking	4.2.2 Spillover Parking	The site's parking space rate meets the City's By-Law requirement for parking.
4.5 Transportation Demand Management	All Elements	Project is non-residential and does not have more than 60 employees on site at any given time. Further, the gas bar is an ancillary use to the Costco Business Centre and the primary function of the facility is to provide gasoline to Costco members for their vehicles.
4.6 Neighborhood Traffic Management	All Elements	The gas bar is contained entirely within the existing Costco Business Centre site and will not change the site's reliance on Cyrville Road as its sole access to the transportation network.
4.7 Transit	4.7.1 Route Capacity	No transit trips to be generated by the Project.
4.8 Network Concept	All Elements	The gas bar is not expected to generate more than 200 person-trips during any peak hour in excess of the equivalent volume permitted by the GM12 zoning for the site.



Section 2

Forecasting

3.1 DEVELOPMENT GENERATED TRAVEL DEMAND

This section details the proposed assumptions and characteristics to develop the Gloucester Costco Business Centre gas bar addition trip generation estimate.

3.1.1 Trip Generation & Mode Shares

This section details the trip generation assumptions and estimates for the proposed Gloucester Business Centre gas bar addition. Kittelson proposes to utilize a trip generation estimate prepared based on a Kittelson Costco Database encompassing Costco-specific trip generation data and characteristics.

COSTCO TRIP GENERATION

For over 25 years, Kittelson has maintained a database of traffic data and travel characteristics for Costco Wholesale. The database contains transportation information such as trip rates, trip type percentages, gas bar queue lengths, and parking demand for Costco locations in North America, including the United States and Canada. The database is updated and refined each time new Costco traffic counts or information become available to Kittelson. To best evaluate the anticipated characteristics of the Gloucester Costco Business Centre gas bar addition, the Costco database was used to develop a trip generation estimate since it provides use-specific data that more accurately represents the anticipated traffic characteristics of the unique development type.

Costco has invested significant effort into developing and maintaining this use-specific database for its warehouses, fuel facilities, and carwashes to enable better planning, design, and operation of their facilities. The Costco transportation database contains a large quantity of data specifically related to Costco gas bars, including trip generation, trip type, and queue length information for a total of 99 Costco gas bars of various sizes located throughout North America. Within the available data encompassed within the database, there is limited data available for gas bars at Costco Business Centres. As such, the trip generation estimate for the Gloucester Costco Business Centre gas bar addition has been estimated by averaging the trip generation information for gas bars with 24 fueling positions at standard Costco Warehouse locations in North America, then adjusting the resulting trip generation results to reflect business centre operations as discussed later in this memorandum.

Due to the nature of Costco membership requirements and Costco sales, Costco members have unique travel characteristics and patterns which are different from customers of other retailers. These unique characteristics and patterns exist in the trip generation for Costco Warehouses/Business Centres, Costco Gasoline facilities, and the trip interaction between the two. The Costco-specific data presented herein follows nationally accepted practices for trip generation data collection as recommended by the Institute of Transportation Engineers (ITE) and presents a robust dataset upon which to confidently predict the fuel facility trip generation and queues of the Gloucester Costco Business Centre fuel facility.

When comparing available Canadian Business Centre site data to US data, there is not a substantial difference. Canadian sites are found to generate similar levels of traffic and lie well within the overall distribution of trip rates. This comparison confirms the homogeneity of Costco trip generation characteristics regardless of geographic location.

COSTCO GAS BAR TRIP CHARACTERISTICS AND REDUCTION FACTORS

The unique nature of Costco's members-only operations results in different trip characteristics than those observed at typical gas/service stations summarized in the *Trip Generation Manual*, published by the Institute of Transportation Engineers (ITE). The percentages of pass-by or diverted trips at Costco gas bars are considerably lower than those documented in the ITE *Trip Generation Manual* for typical gas/service stations. In addition, the members-only access requirement also has a significant effect on trip internalization (or sharing of trips) between the warehouse and the gas bar. Fewer people exclusively visit a Costco gas bar (in comparison to a typical standalone gas/service station) because they have another primary purpose for visiting the site (that being a trip to the Warehouse/Business Centre).

Internal Trips

Internal capture trips account for those members who patronize both the Business Centre and the gas bar during a single visit to the Costco site. As such, although they account for a trip to both the Business Centre and the gas bar, they only account for one overall vehicle trip to the site and on the surrounding transportation system. **Table 4** outlines the percentage of internalized trips (trips frequenting both the Business Centre and gas bar) for each time period at three existing Costco Business Centre locations with gas bars. The percentages presented in **Table 4** are calculated based on proprietary member transaction data collected at existing Costco Business Centres with gas bars.

Table 4. Costco Business Centre with Fuel Facility Internal Trip Characteristics

Site	Weekday Daily	Weekday AM Peak Hour	Weekday PM Peak Hour	Saturday Daily	Saturday Midday Peak Hour
Hawthorne, CA	14.2%	11.4%	12.6%	17.9%	17.5%
Hayward, CA	20.5%	16.2%	16.5%	23.7%	24.5%
Commerce, CA	21.0%	16.0%	17.9%	26.6%	29.4%
Average	18.5%	14.5%	15.7%	22.7%	23.8%

Source: Kittelson Canada, LLC., 2025

Pass-By Trips

Pass-by trips represent members (and trips) that are currently traveling on the surrounding street network immediately adjacent to the site for some other primary purpose (such as a trip from work to home) and stop into the site enroute during their normal trip. As such, pass-by trips do not result in a net increase in traffic on the surrounding transportation system and their only effect occurs at the immediate intersections and site access driveways where they become turning movements.

Diverted Trips

Diverted trips are similar to pass-by trips in that they represent members (and trips) that are currently traveling on the surrounding street network for some other primary purpose and stop into the site enroute during their travel. However, as the name indicates, diverted trips divert from roadways that are not immediately adjacent to the Costco site.

Member Intercept Survey Methodology (Pass-By & Diverted Trips)

Member surveys in Warehouses or Business Centres and at the gas bar are conducted by trained data collection professionals who ask members to answer a short survey. The survey provides important information about trip type (which route(s) members used to visit Costco) and allows us to clearly differentiate and quantify pass-by and diverted trips (and inversely, net new trips after adjustments for internalization which is calculated using transaction data from the warehouse and gas bar during the same time periods). These intercept surveys are conducted during key peak time periods (most often weekday 4-7 PM, Saturday 11 AM – 2 PM) and are conducted quickly/efficiently while a member is checking out or pumping gas.

Two people are stationed both in the warehouse and at the gas bar. For those three-hour time periods, they “intercept” as many members as they can and document the survey results. In general, surveys typically record 200-300 responses for each time period at both the gas bar and in the warehouse, which is a significant amount of data.

COSTCO BUSINESS CENTRE ADJUSTMENT FACTORS

Fuel facilities at Costco Business Centres generally generate fewer trips compared to traditional Costco Warehouse fuel facilities, particularly on a daily basis. This is because Business Centres provide a different business/operational model that is targeted toward small business owners that is less applicable/desirable to the general Costco member. When considering peak hour activity, Business Centre gas bar trip generation is generally similar to that of a Warehouse gas bar – the exception being the weekday AM peak hour. A Costco Business Centre (and its gas bar) generally generate more traffic than traditional warehouse/gas bar locations because the Business Centre is open during the weekday AM peak hour while a traditional Warehouse is not.

Table 5 compares the average trip generation for fuel facilities at Costco Business Centres with the average trip generation for fuel facilities at standard Costco Warehouses with the same number of fueling positions based on the data available in the trip generation database.

Table 5. Costco Business Centre & Warehouse Gas Bar Trip Generation Comparison

Site Type	Weekday Daily	Weekday AM Peak Hour	Weekday PM Peak Hour	Saturday Daily	Saturday Midday Peak Hour
Business Centre Trips	6,049	482	520	5,224	536
Warehouse Average Trips	6,372	416	502	6,595	549
% Difference WH to BC	-5.1%	15.9%	3.6%	-20.8%	-2.4%

Source: Kittelson Canada, LLC, 2025

Comparing the trip generation data collected for Costco Warehouse fuel facilities and Costco Business Centre gas bars, the gas bars at Business Centres generate 5.1% less traffic on a weekday than a Costco Warehouse, 15.9% more traffic during the weekday AM peak hour, and 3.6% more traffic during the weekday PM peak hour. Additionally, the gas bars at Business Centres generate 20.8% less traffic on a Saturday than a Costco Warehouse, and 2.4% less traffic during the Saturday midday peak hour.

In addition to the difference in trip generation, the addition of a gas bar to the Gloucester Business Centre is likely to result in a below-average increase in traffic because of the presence of another nearby 24-position gas bar at the Gloucester Warehouse location (1415 Blair Towers Place) located just three (3) km to the north. As such, this analysis can be considered conservative as no attempt to adjust for this specific contextual factor is assumed.

GLoucester COSTCO GAS BAR ADDITION TRIP GENERATION ESTIMATE

To estimate the trip generation for the Gloucester Costco Business Centre gas bar, trip generation data at five (5) Costco gas bars that have 24 fueling positions across North America were reviewed and averaged.

Table 6 presents a summary of the trip type characteristics for the proposed Gloucester Costco Business Centre gas bar as previously discussed. **Table 7** presents the trip generation estimate for the proposed 24 position Gloucester Costco Business Centre fuel facility for the weekday AM, weekday PM, and Saturday midday peak hours, as well as the weekday and Saturday daily periods.

Table 6. Gloucester Costco Business Centre Gas Bar Trip Generation Trip Type Characteristics

Land Use	Weekday Daily	Weekday AM Peak Hour	Weekday PM Peak Hour	Saturday Daily	Saturday Midday Peak Hour
Business Centre Adjustment	94.90%	115.90%	103.60%	79.20%	97.60%
Internal Trips	18.54%	14.54%	15.67%	22.72%	23.80%
Pass-By Trips ¹	31.91%	36.20%	31.91%	30.46%	30.46%
Diverted Trips ¹	39.83%	39.73%	39.83%	35.28%	35.28%
Net New Trips	28.26%	24.07%	28.26%	34.26%	34.26%

Source: Kittelson Canada, LLC, 2025

¹ Weekday PM and Saturday Midday percentages have been applied to Weekday Daily and Saturday Daily, respectively.

Table 7. Gloucester Costco Business Centre Gas Bar Trip Generation Estimate

Trip Type	Size (FP)	Weekday Daily Trips	Weekday AM Peak Hour			Weekday PM Peak Hour			Saturday Daily Trips	Saturday Midday Peak Hour		
			Total	In	Out	Total	In	Out		Total	In	Out
Total Trips	24 FP	6,076	324	162	162	522	261	261	6,080	626	313	313
Business Centre Adjustment		-310	+52	+26	+26	+20	+10	+10	-1,264	-14	-7	-7
Business Centre Total Trips		5,766	376	188	188	542	271	271	4,816	612	306	306
Internal Trips		(1,070)	(54)	(27)	(27)	(86)	(43)	(43)	(1,094)	(146)	(73)	(73)
Total External Trips		4,696	322	161	161	456	228	228	3,722	466	233	233
Pass-By Trips		(1,498)	(118)	(59)	(59)	(146)	(73)	(73)	(1,134)	(142)	(71)	(71)
Diverted Trips		(1,872)	(128)	(64)	(64)	(182)	(91)	(91)	(1,314)	(164)	(82)	(82)
Net New Trips		1,326	76	38	38	128	64	64	1,274	160	80	80

Source: Kittelson Canada, LLC, 2025

As shown in **Table 7**, the Gloucester Costco Business Centre gas bar is estimated to generate approximately 76 net new weekday AM peak hour trips (38 inbound / 38 outbound), approximately 128 net new weekday

PM peak hour trips (64 inbound / 64 outbound), and 160 net new Saturday midday peak hour trips (80 inbound / 80 outbound). Additionally, the Gloucester Costco Business Centre fuel facility is estimated to generate approximately 1,326 net new weekday daily trips and 1,274 net new Saturday daily trips.

COSTCO BUSINESS CENTRE GAS BAR QUEUING

Similar to the trip generation estimate, anticipated queues at the Gloucester Costco Business Centre gas bar were forecast by averaging the available data in the Costco Database for sites with 24 fueling positions. **Table 8** presents the estimated 95th percentile queue expressed in number of vehicles for a gas bar with 24 fueling positions at a standard Costco Warehouse based on data available in the trip generation database.

Table 8. Forecasted 95th Percentile Queue (Number of Vehicles) for Standard Costco Warehouse

Number of Fueling Positions	Weekday AM Peak Hour	Weekday PM Peak Hour	Saturday Midday Peak Hour
24	4	13	21

Source: Kittelson Canada, LLC, 2025

To most accurately reflect Costco Business Centre operations as compared to operations at a standard Costco Warehouse, an adjustment factor was applied for each peak hour condition. **Table 9** compares the average 95th percentile queues expressed in number of vehicles for gas bars at Costco Business Centres with the average 95th percentile queue for gas bars at standard Costco Warehouses (with the same number of fueling positions) based on the data available in the trip generation database.

Table 9. Costco Business Centre & Warehouse Gas Bar 95th Percentile Queue Comparison

Site Type	Weekday AM Peak Hour	Weekday PM Peak Hour	Saturday Midday Peak Hour
Business Centre Average Queue	13	14	47
Warehouse Average Queue	7	26	32
% Difference WH to BC	86.6%	-45.1%	48.3%

Source: Kittelson Canada, LLC, 2025

This comparison suggests that Business Centres generate 86.6% more vehicles in the 95th percentile queue during the weekday AM peak hour, 45.1% fewer vehicles in the 95th percentile queue during the weekday PM peak hour, and 48.3% more vehicles in the 95th percentile queue during the Saturday midday peak hour relative to traditional Costco Warehouses.

These adjustments were applied to the estimated 95th percentile queues presented for a standard Costco Warehouse gas bar with 24 fueling positions to forecast the Business Centre queues. The resulting forecast 95th percentile queue in number of vehicles for the Gloucester Costco Business Centre are presented in **Table 10**.

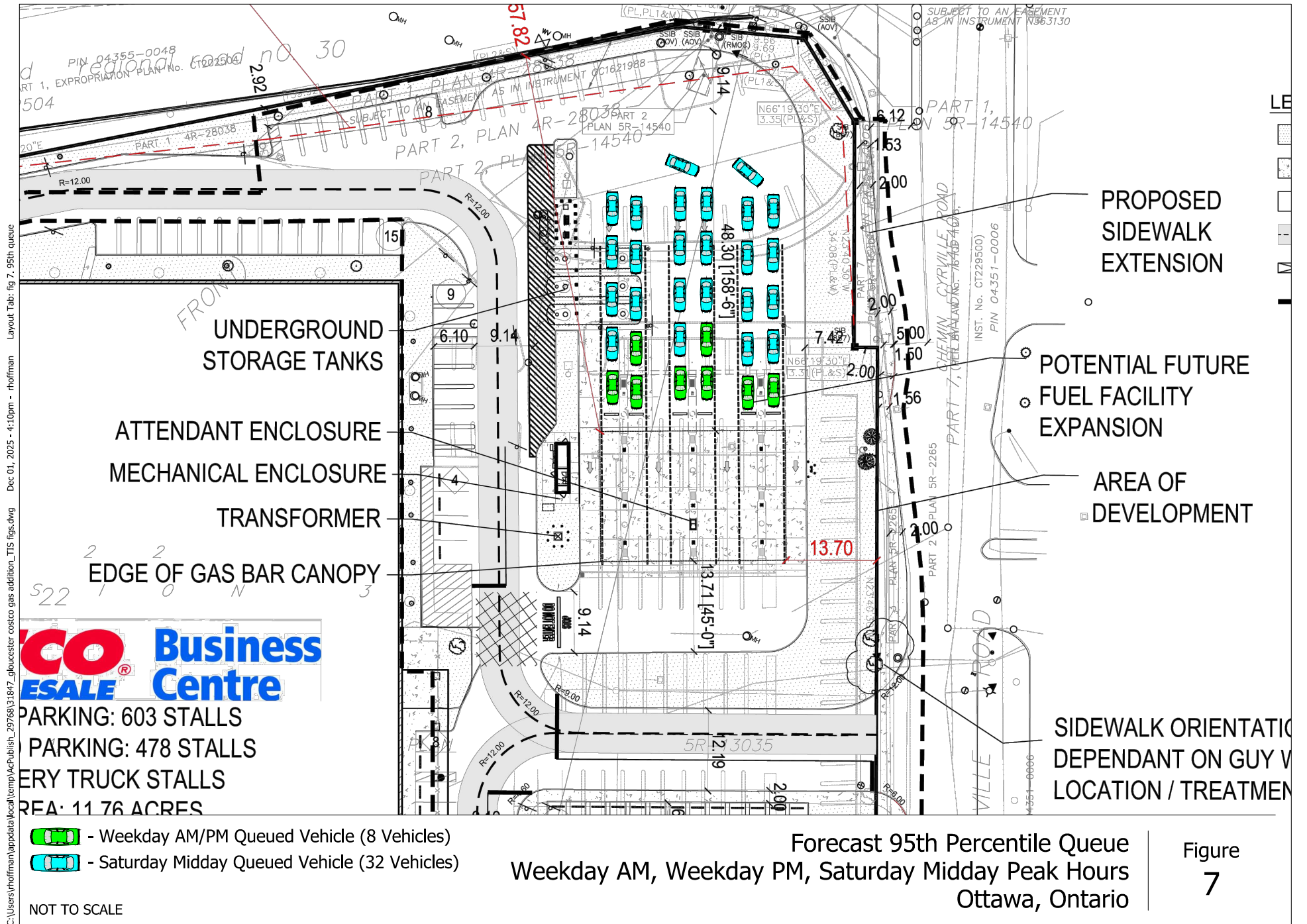
Table 10. Forecast Gloucester Costco Business Centre Gas Bar 95th Percentile Queue (Number of Vehicles)

Site Type	Weekday AM Peak Hour	Weekday PM Peak Hour	Saturday Midday Peak Hour
Standard Costco Warehouse	4	13	21
<i>WH to BC Adjustment</i>	<i>86.6%</i>	<i>-45.1%</i>	<i>48.3%</i>
Business Centre	8	8	32

Source: Kittelson Canada, LLC, 2025

As shown, the Gloucester Costco Business Centre gas bar is estimated to generate eight (8) weekday AM 95th percentile queues, eight (8) weekday PM 95th percentile queues, and 32 Saturday midday 95th percentile queues. **Figure 7** provides a visual representation of these estimated queues in the available queue storage area as shown on the site plan presented in Figure 2.

As shown, peak 95th percentile queues will be contained entirely within the designated queue storage area of the gas bar.



Forecast 95th Percentile Queue
Weekday AM, Weekday PM, Saturday Middy Peak Hours
Ottawa, Ontario

Figure
7

DEVELOPMENT GENERATED PERSON TRIPS

The most accurate/reliable estimate of trip generation for this commercial use is Costco-specific trip data presented above. Because a gas bar exclusively generates vehicular traffic, no conversion of development-generated trips to “person trips” is assumed or made. The gas bar itself is not a primary generator of trips but ancillary (secondary) to the Costco Business Centre and is only available to Costco members. As such, additional data collection regarding mode share/travel characteristics was not conducted.

For reference purposes, the Costco Business Centre Gas Bar site falls within the Alta Vista District. Per Table 13 of the 2020 *TRANS Trip Generation Manual Summary Report*³, the following mode shares are identified below in **Table 11**.

Table 11. Future Mode Share Targets for Development (Commercial)

Travel Mode	Mode Share - AM Peak Period	Mode Share - PM Peak Period
Transit	12%	9%
Walking	14%	11%
Cycling	1%	0%
Auto Passenger	9%	20%
Auto Driver	64%	60%

The gas bar is an ancillary use to an existing commercial business (Costco Business Centre) intended to provide an additional service/convenience to members. It is recognized that the gas bar itself will not generate trips other than vehicles, but note the site is already well served by transit, pedestrian, and bicycle facilities. Therefore, assuming no mode split or vehicular trip reduction for the gas bar will produce both realistic and conservative results in this TIA.

3.1.2 Trip Distribution

Based on current traffic patterns, anticipated future development, and Costco’s established market and trade area, the proposed net new trip distribution pattern is as follows:

- 60% west on Innes Road
- 30% east on Innes Road
- 10% north on Cyrville Road

For assignment purposes, Costco pass-by trips will be assumed to originate exclusively from Innes Road and the north leg of Cyrville Road. Diverted trips will be assumed to originate from the Trans-Canada Highway (Highway 417) and since the highway is not a part of the study area, diverted trips will effectively be modeled as net new trips at the study intersections.

³ WSP. *TRANS Trip Generation Manual Summary Report*. October 2020.

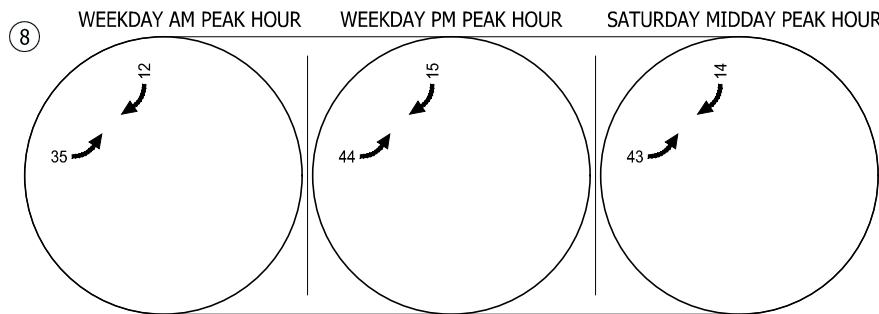
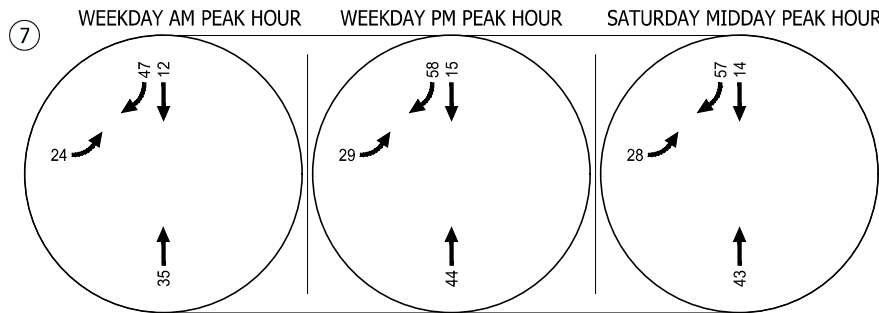
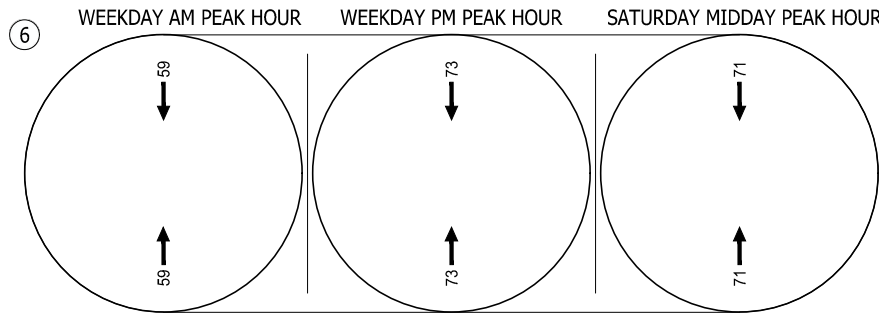
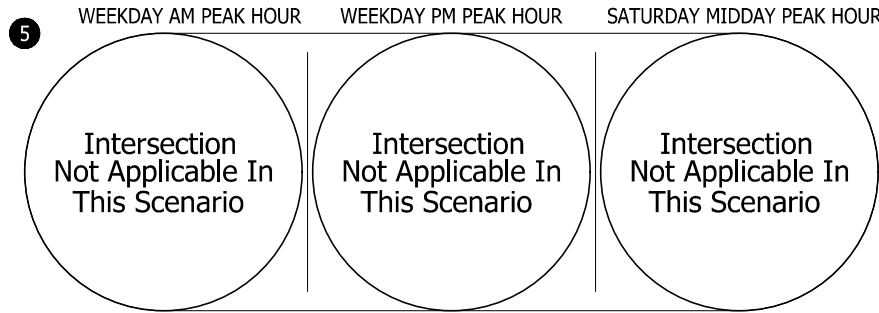
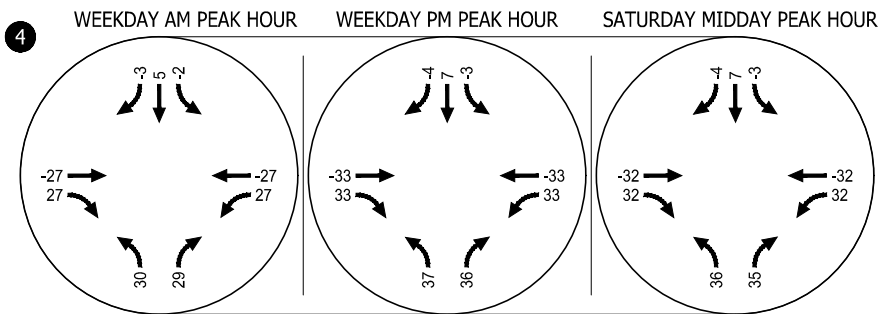
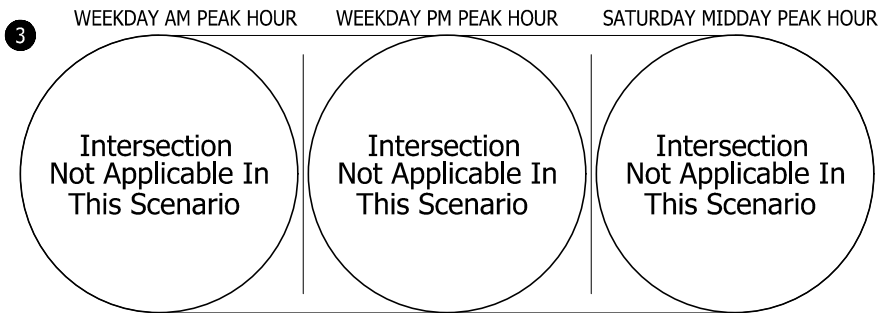
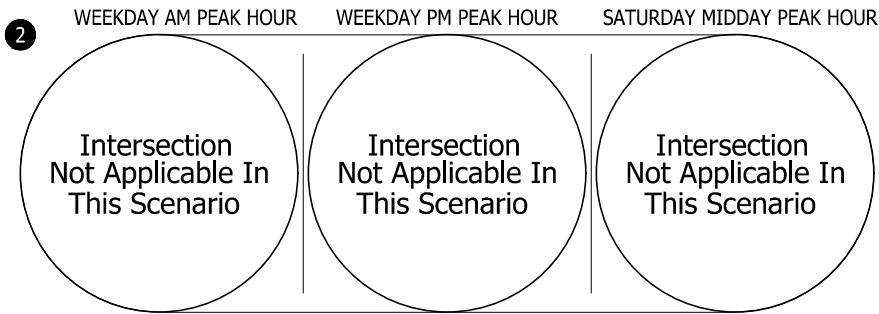
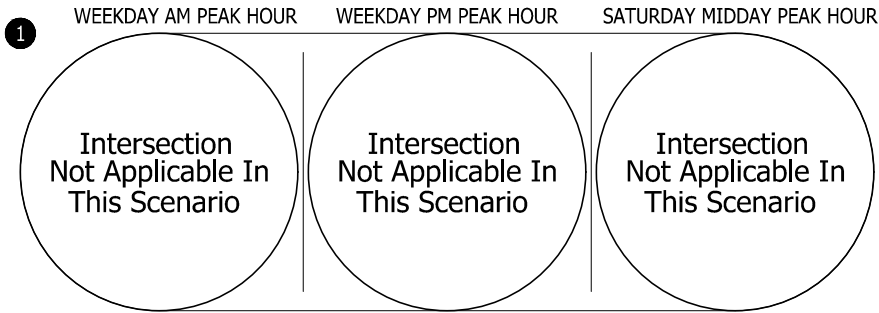
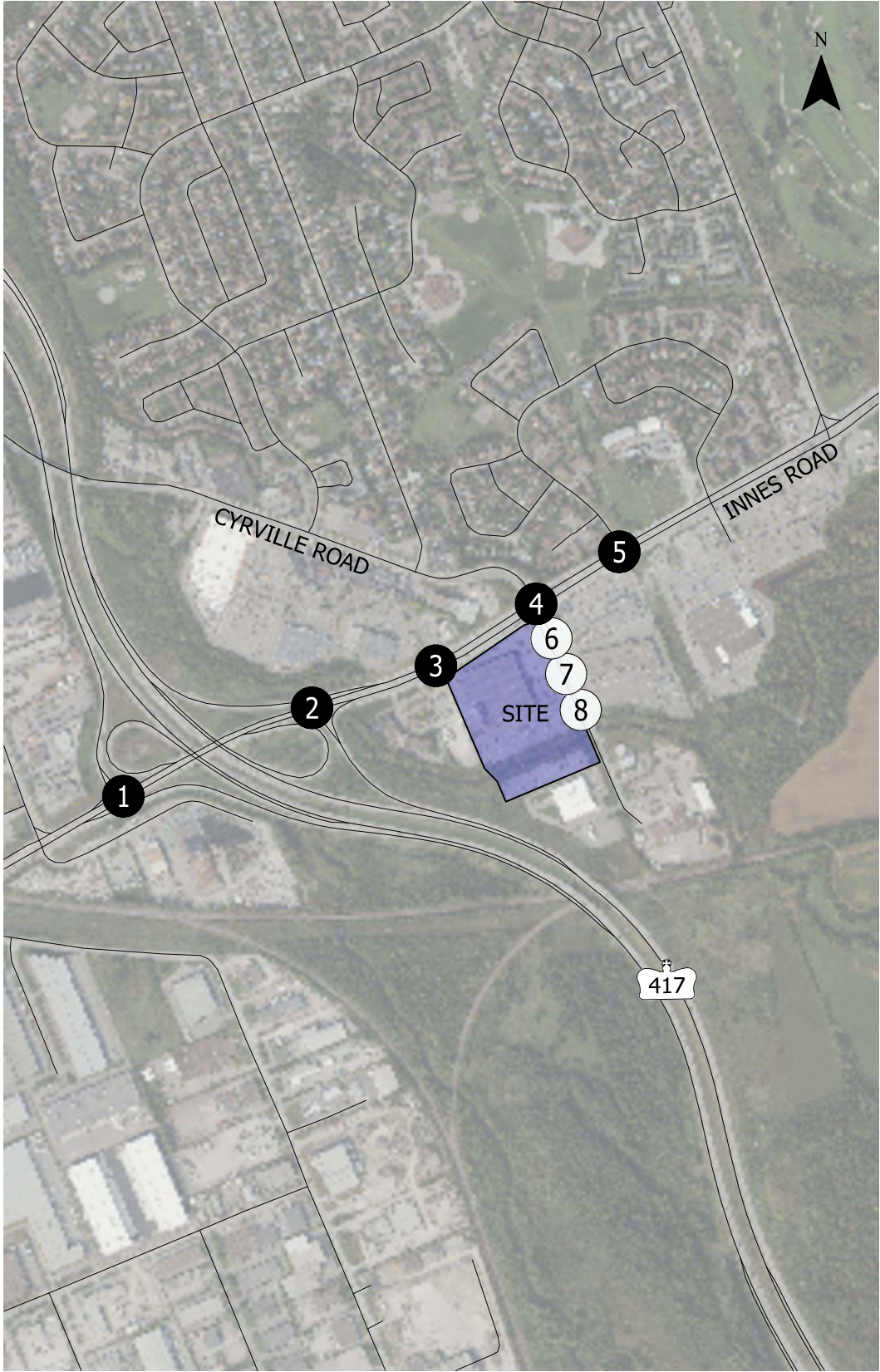
3.1.3 Trip Assignment

Pass-by, diverted, and net new site trips were assigned to the proposed study area according to the distribution assumptions outlined above. **Figure 8** depicts the pass-by trip assignment for the weekday AM, weekday PM, and Saturday midday peak hours, respectively. **Figure 9** depicts the diverted trip assignment for the weekday AM, weekday PM, and Saturday midday peak hours, respectively. **Figure 10** depicts the primary trip assignment for the weekday AM, weekday PM, and Saturday midday peak hours, respectively.

In addition to the assignment of new trips associated with the Project, given the closure of the northernmost Costco access (intersection 6) a trip redistribution was conducted to reassign existing Gloucester Costco Business Centre Warehouse trips to the new full movement access (intersection 7). **Figure 11** depicts the existing trip reassignment.

Figure 12 depicts the total external trip assignment, calculating by summing the pass-by, diverted, and net new trips, for the weekday AM, weekday PM, and Saturday midday peak hours, respectively.

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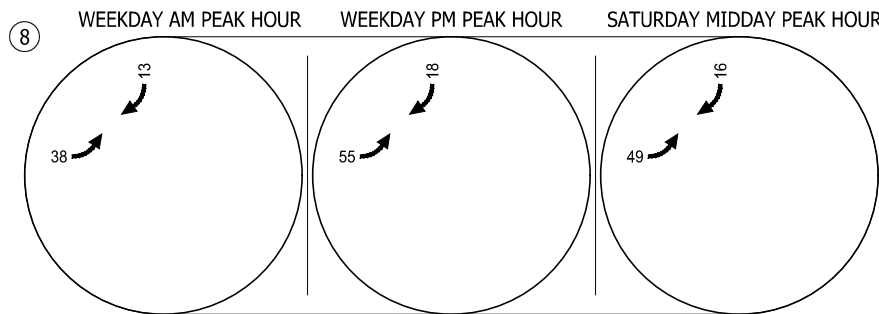
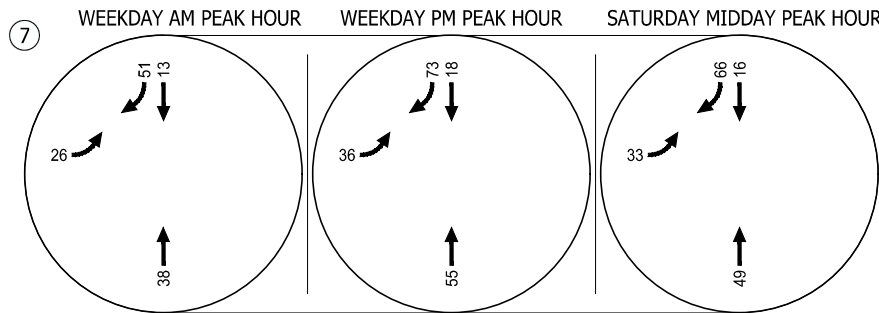
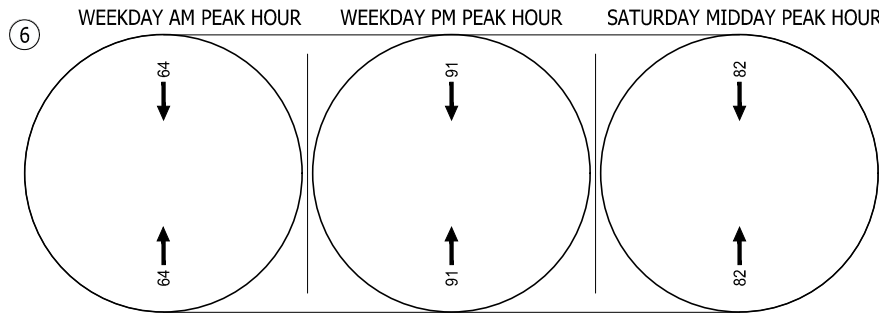
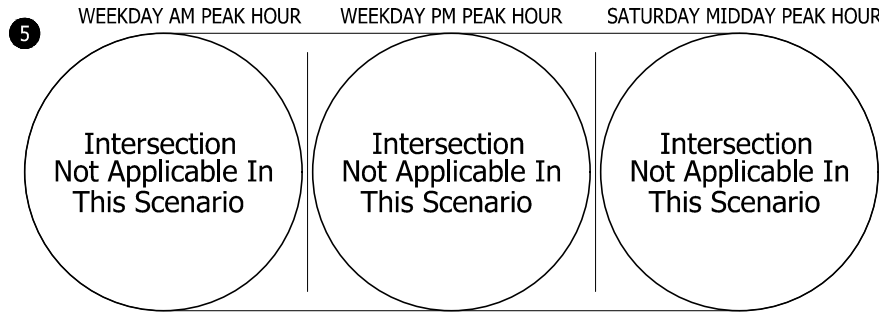
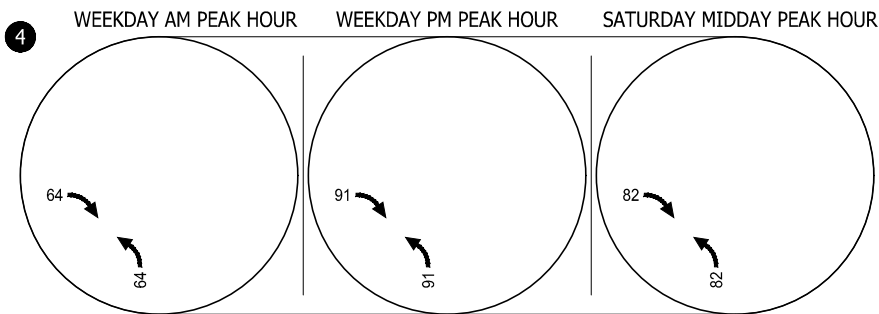
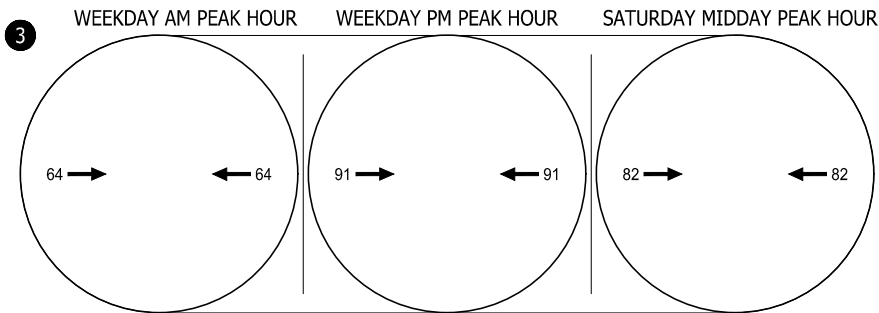
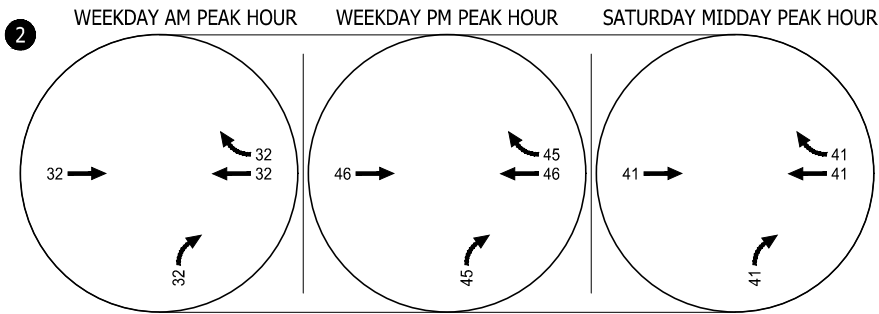
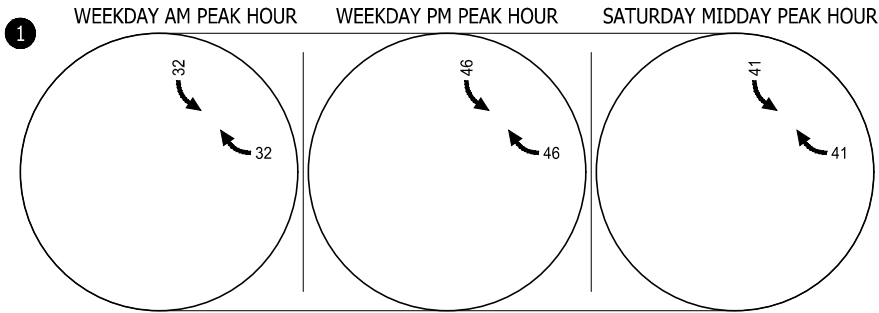
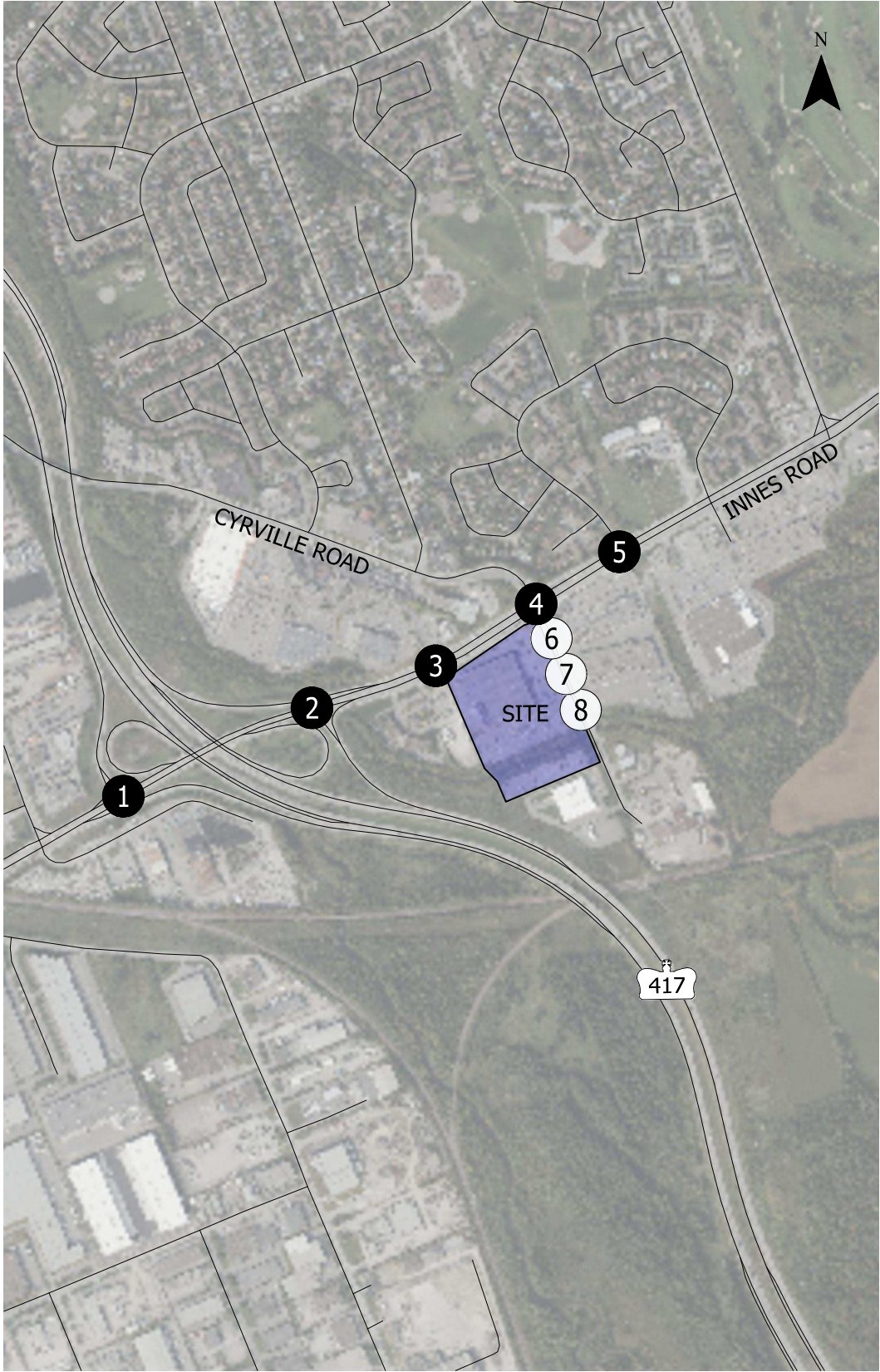


- Study Intersection
- Study Site Access

Trip Assignment: Pass-By Trips
Weekday AM, Weekday PM, Saturday Midday Peak Hours
Ottawa, Ontario

Figure
8

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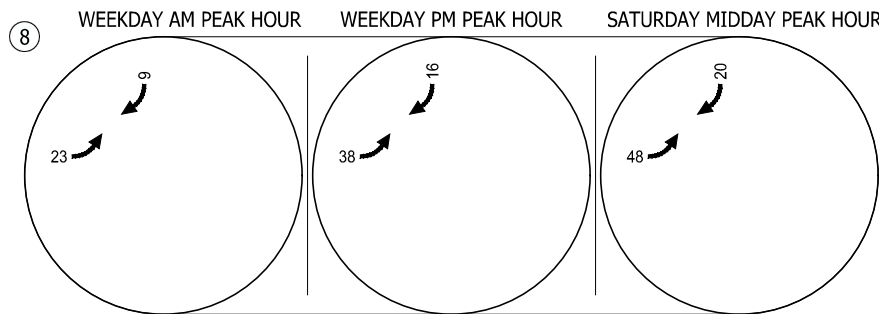
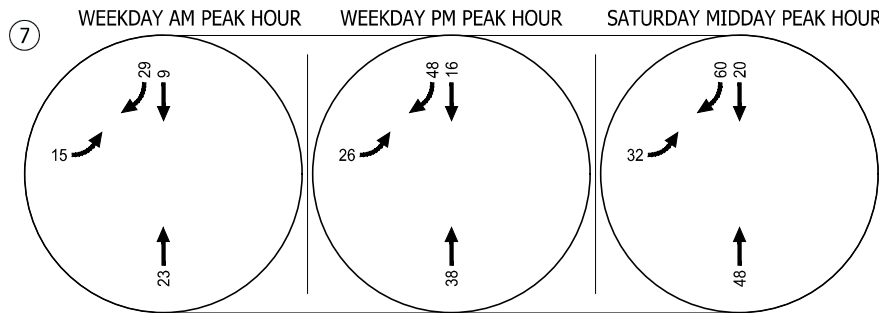
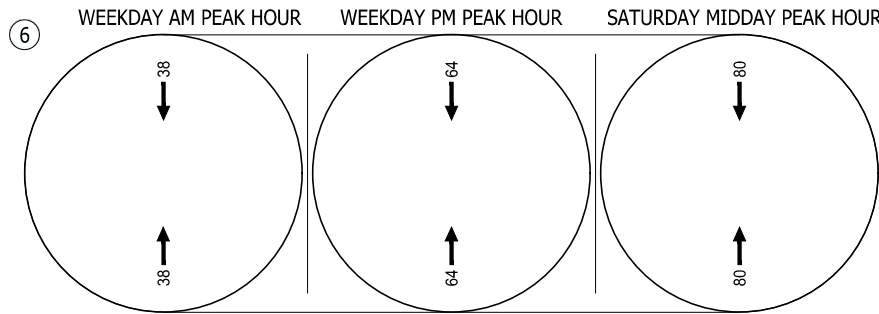
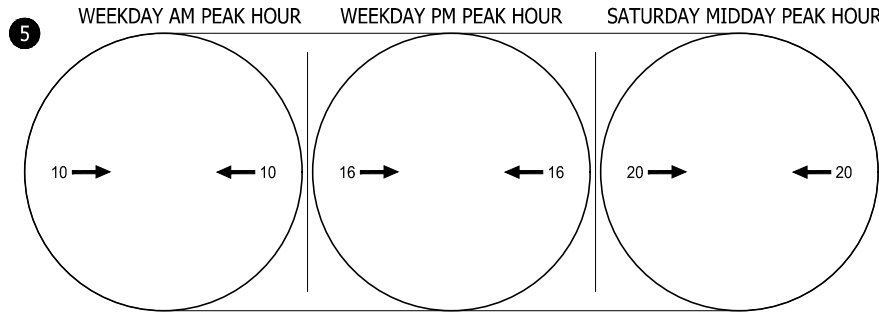
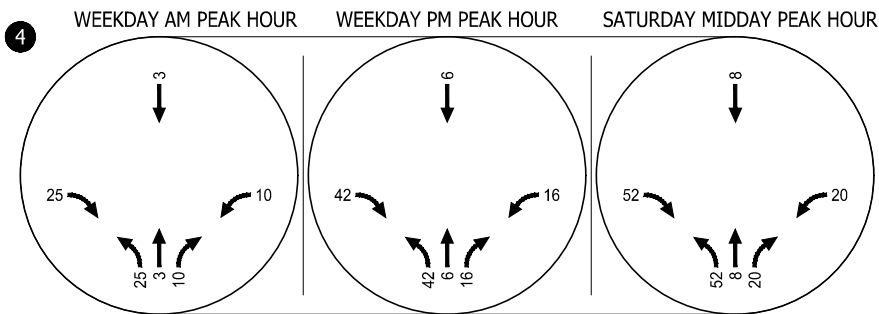
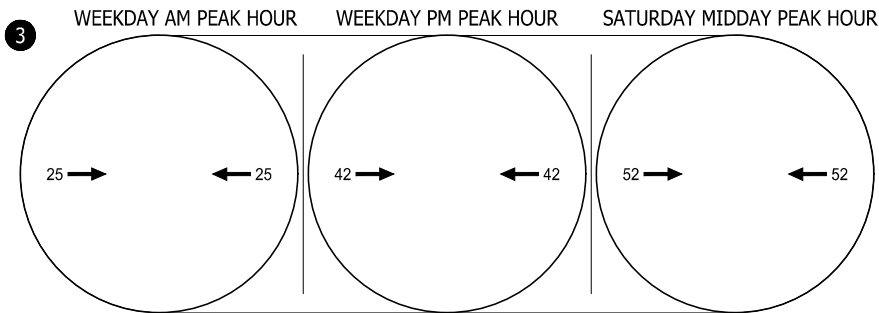
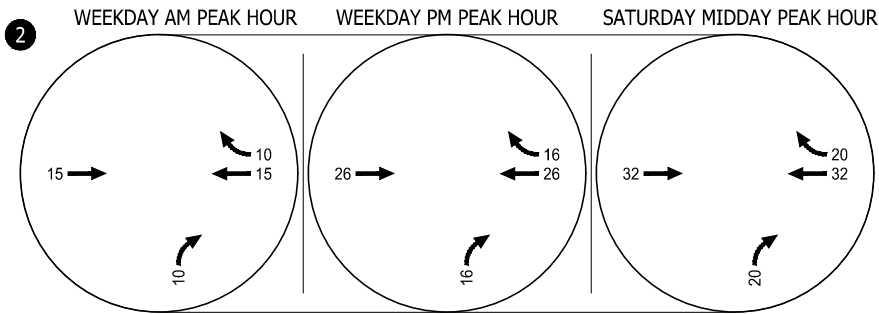
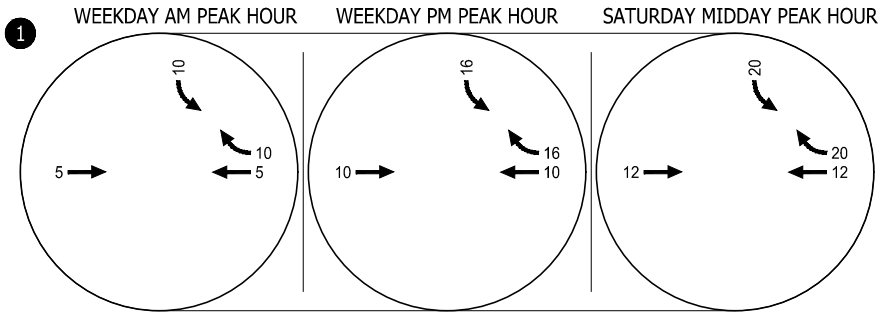
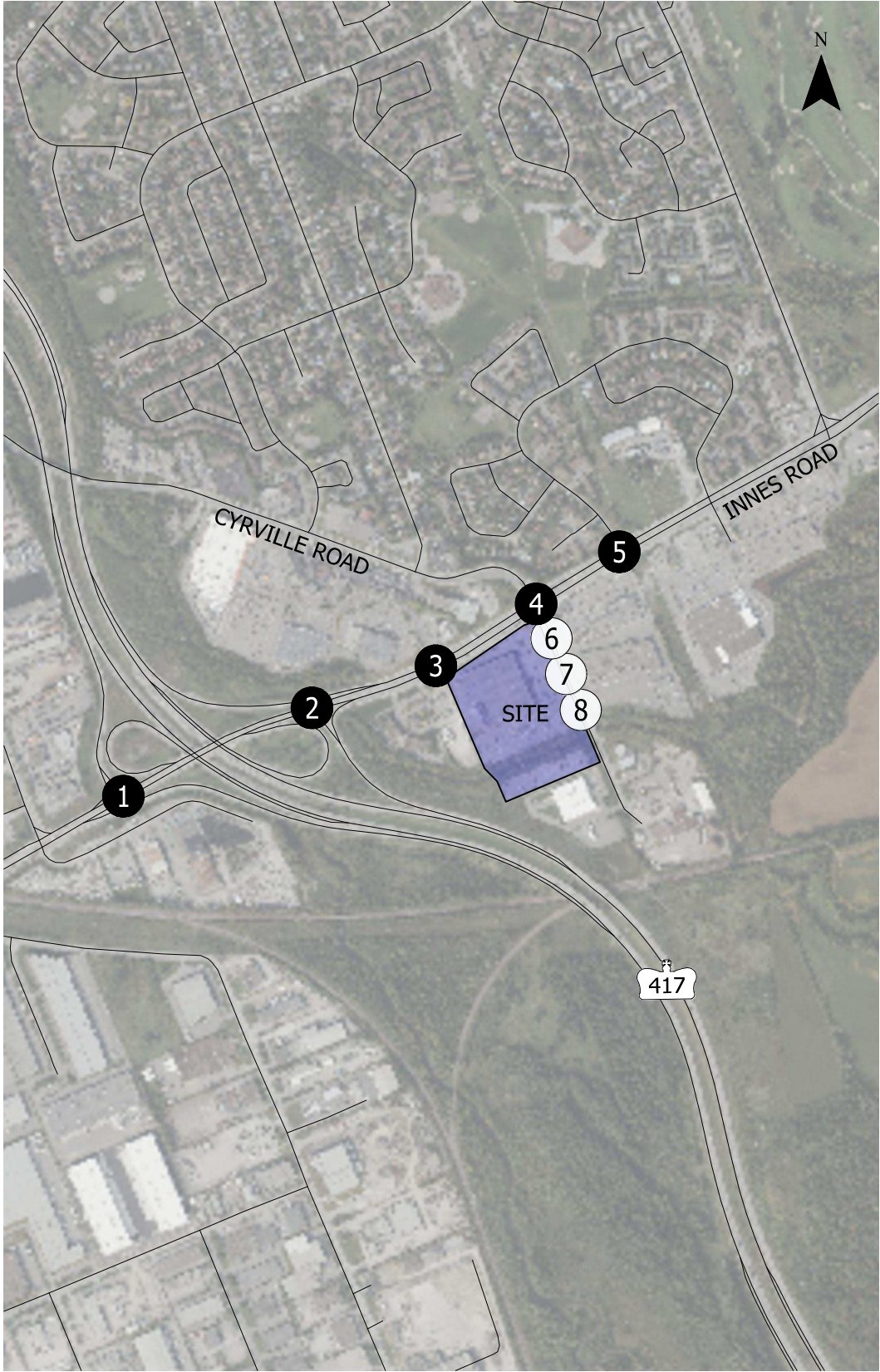


- Study Intersection
- Study Site Access

Trip Assignment: Diverted Trips
Weekday AM, Weekday PM, Saturday Midday Peak Hours
Ottawa, Ontario

Figure
9

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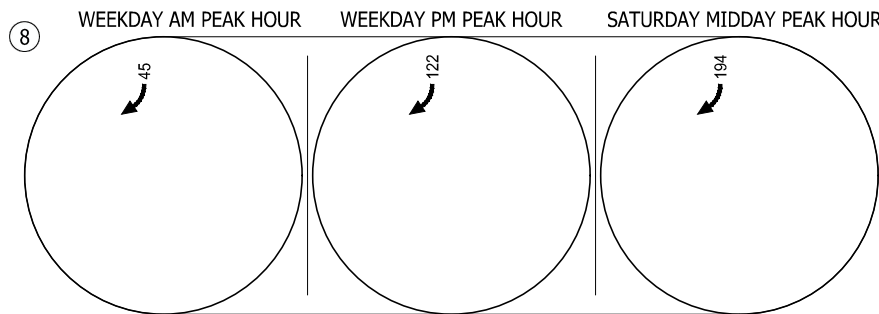
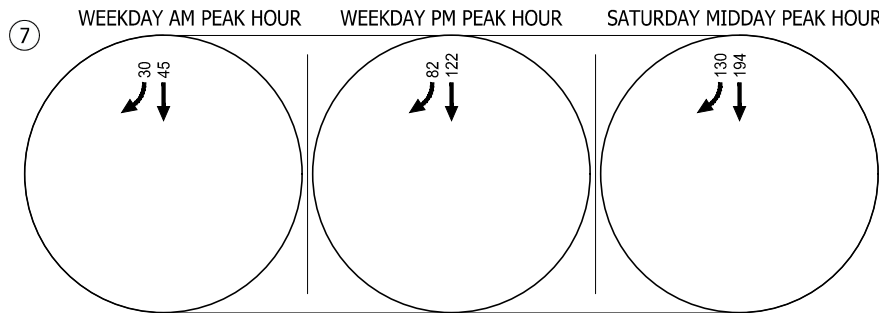
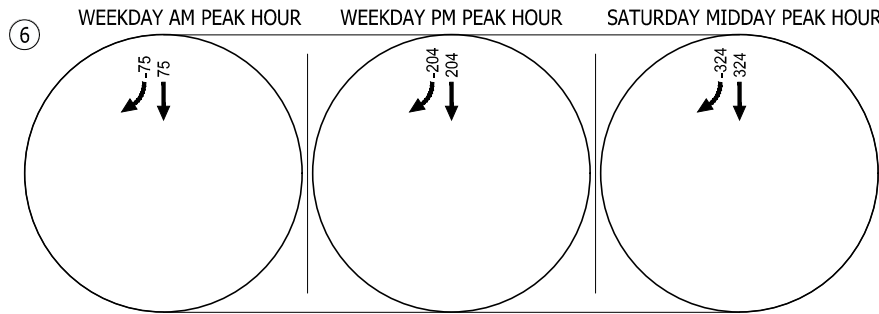
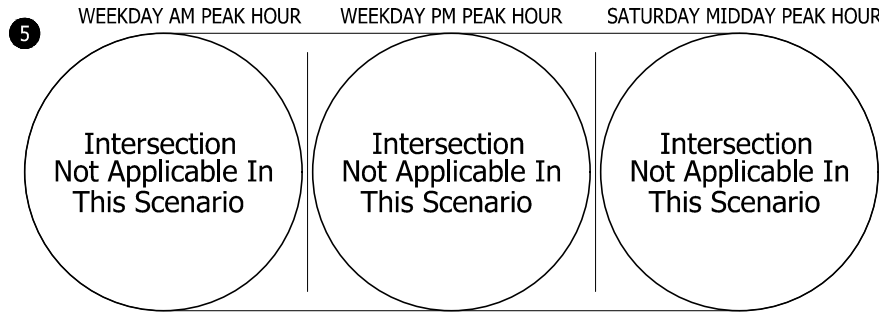
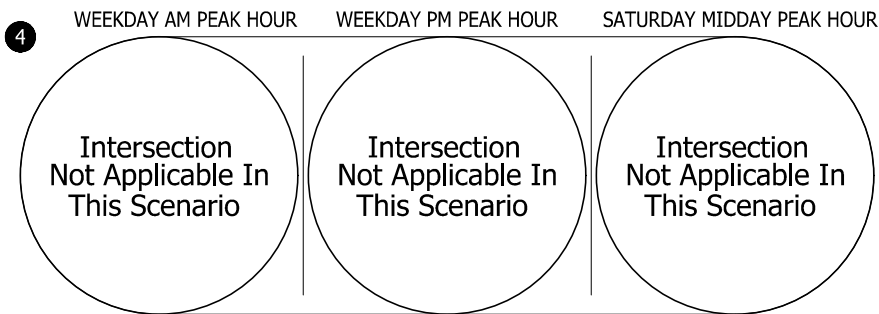
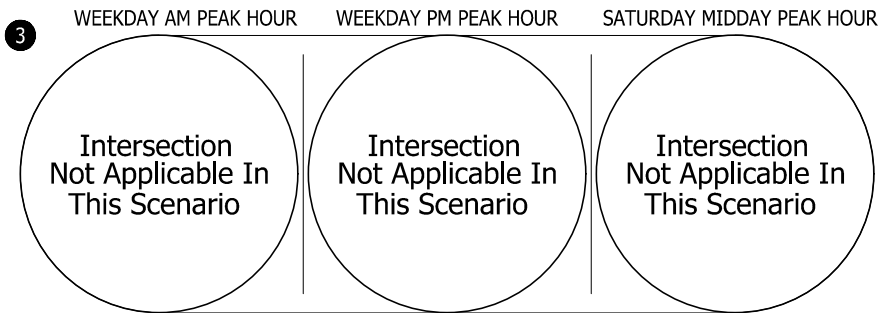
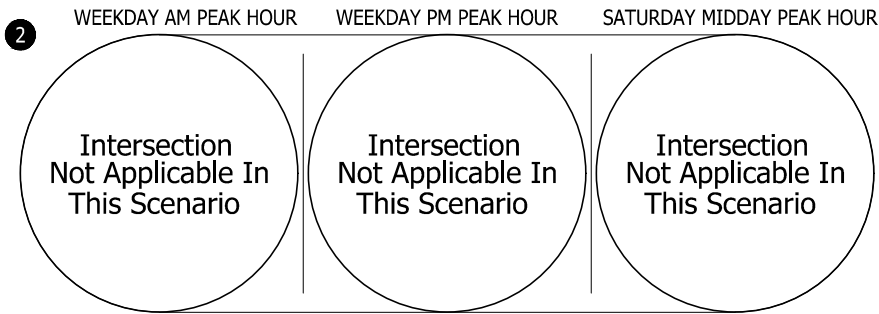
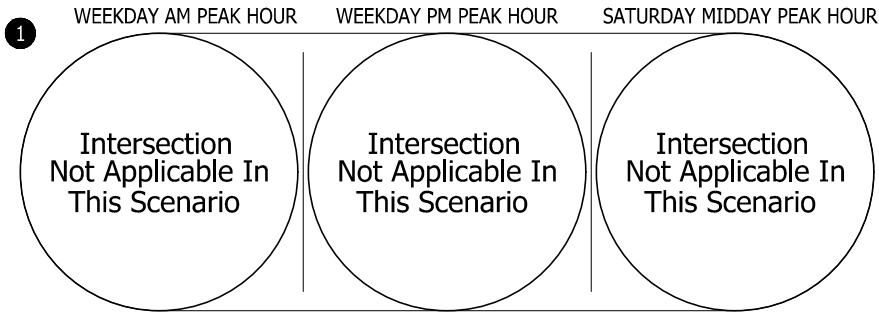
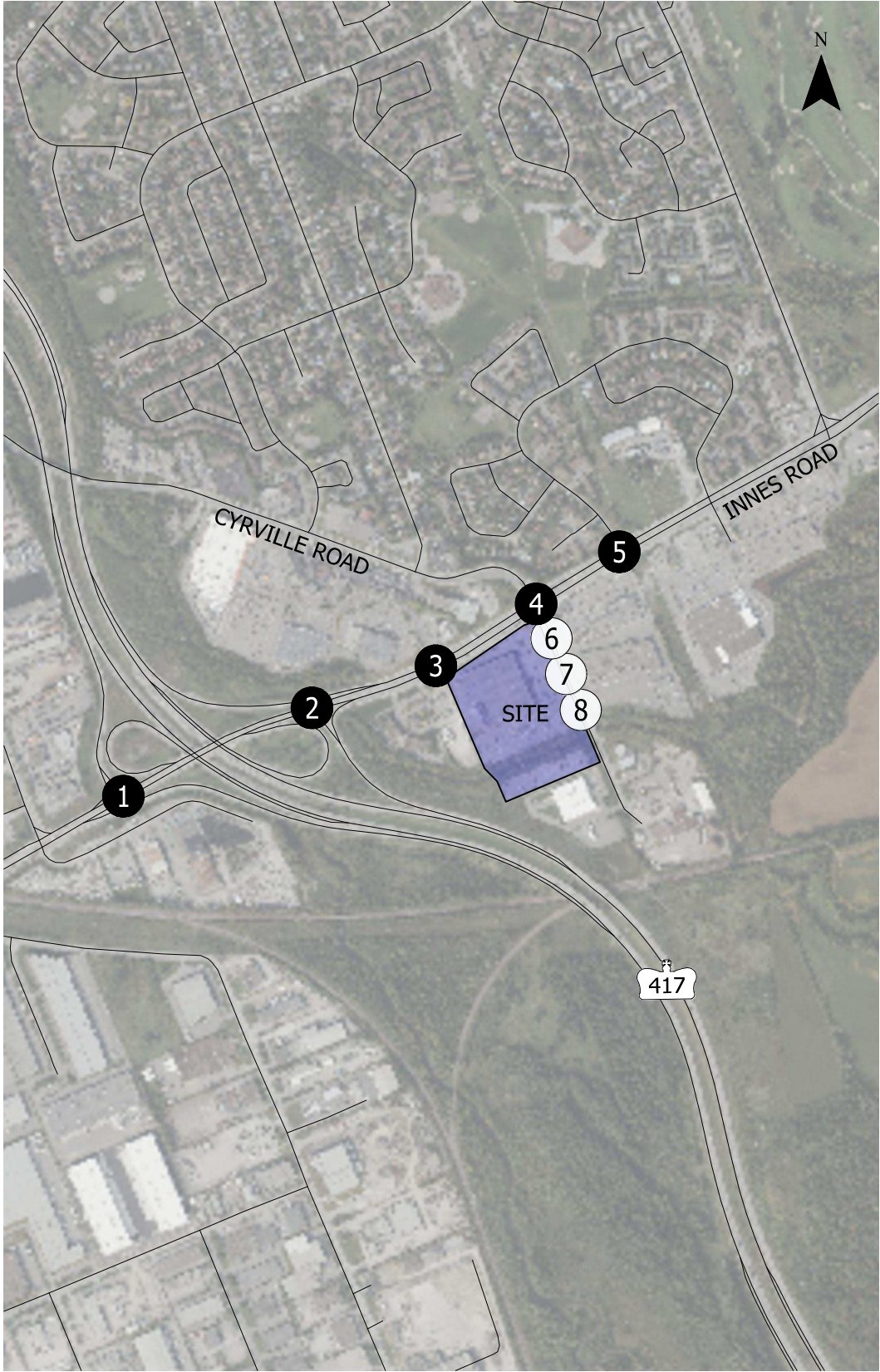


- Study Intersection
- Study Site Access

Trip Assignment: Net New Trips
Weekday AM, Weekday PM, Saturday Midday Peak Hours
Ottawa, Ontario

Figure
10

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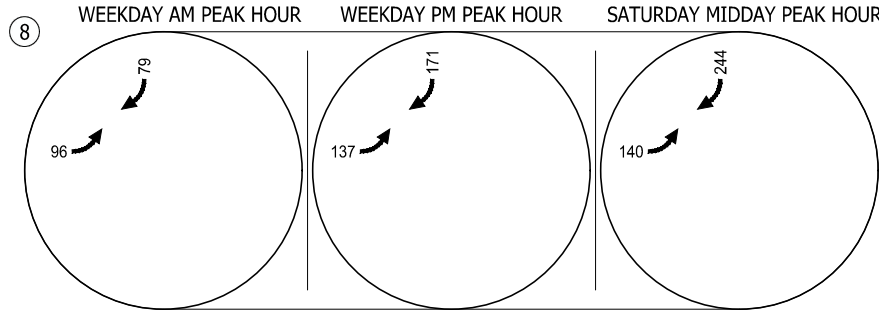
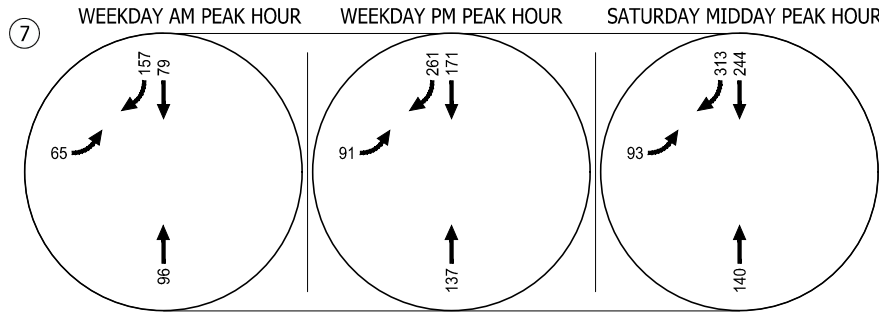
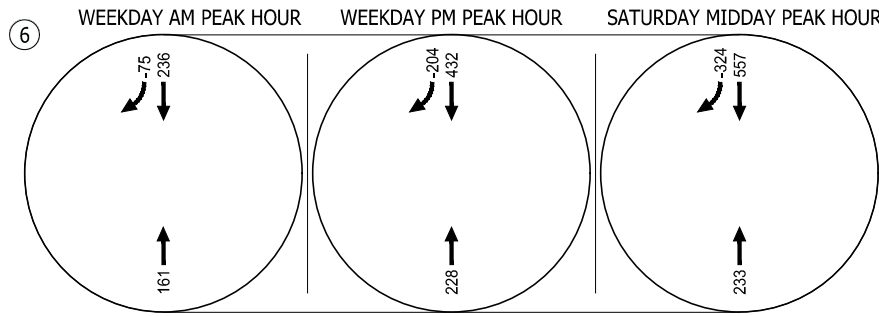
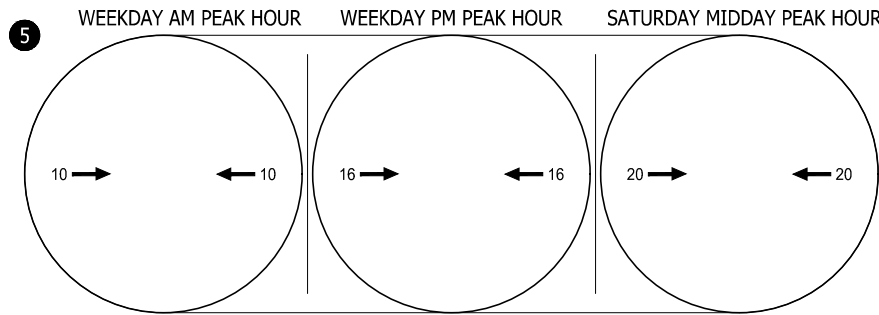
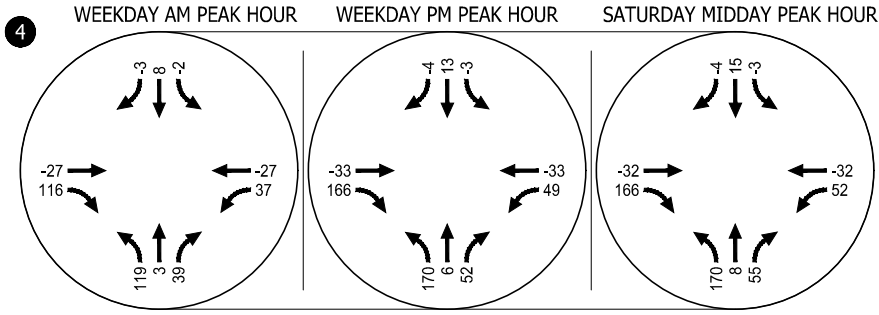
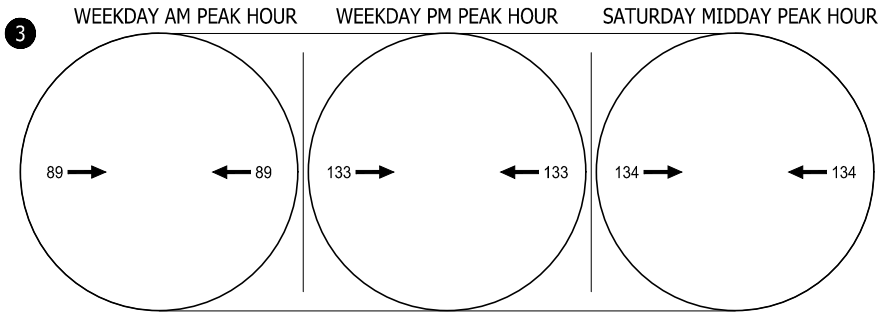
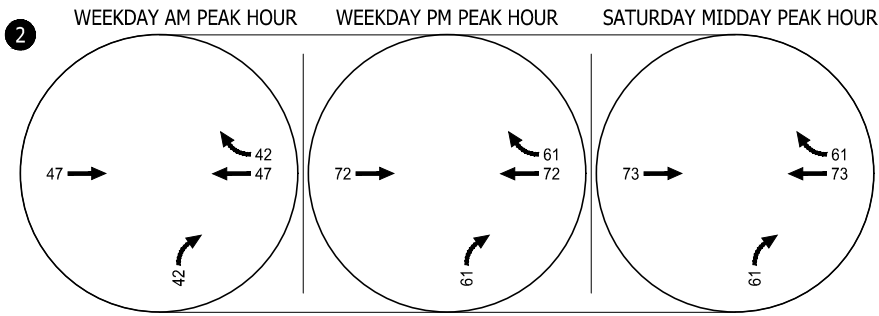
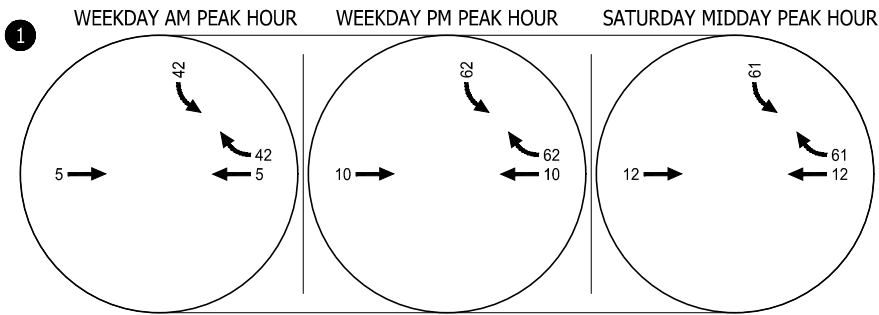
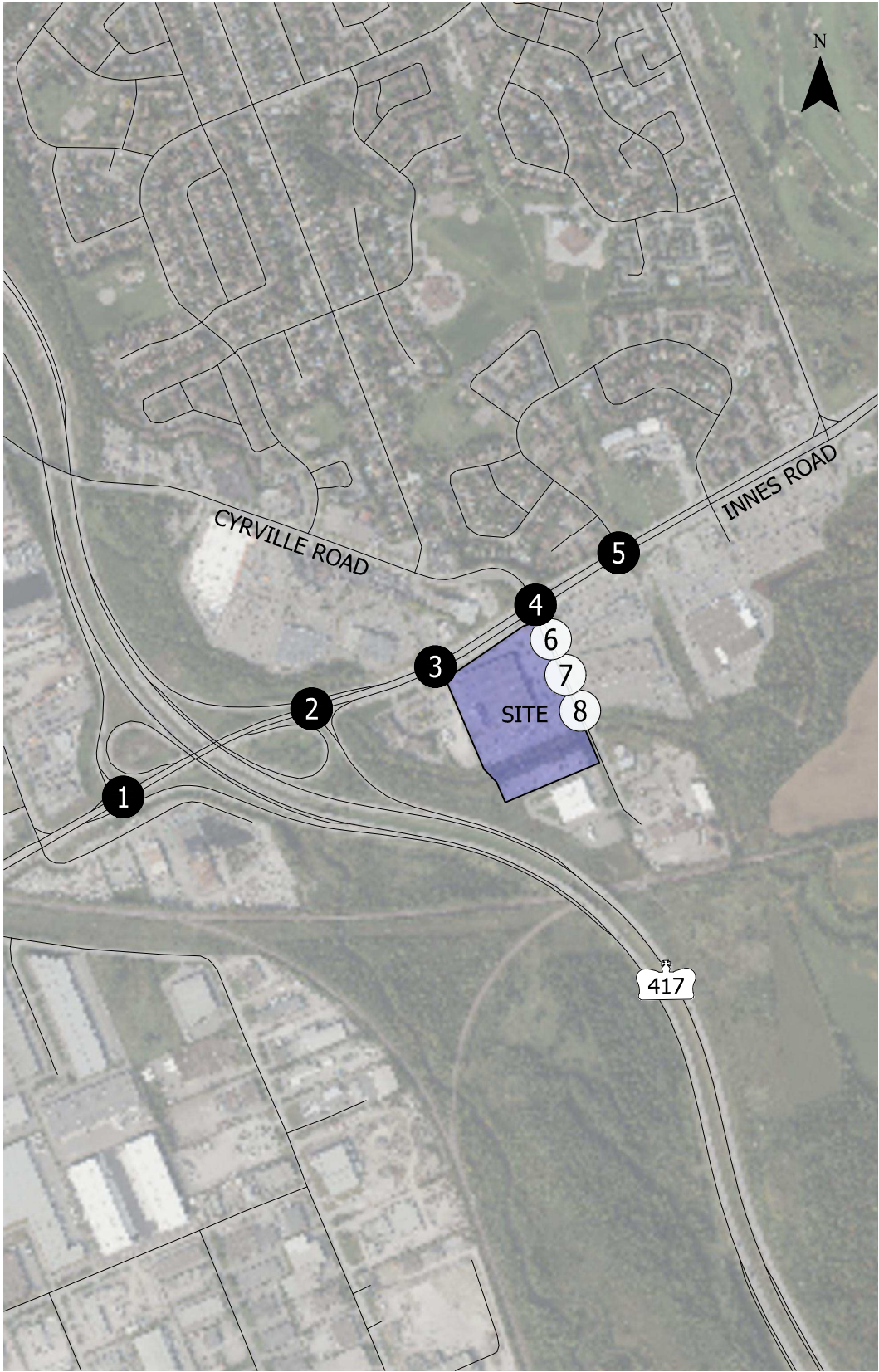


- Study Intersection
- Study Site Access

Trip Assignment: Existing Trip Reassignment
Weekday AM, Weekday PM, Saturday Midday Peak Hours
Ottawa, Ontario

Figure
11

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- Study Intersection
- Study Site Access

Trip Assignment: Total External Trips (Pass-By + Diverted + Net New + Reassignment)
Weekday AM, Weekday PM, Saturday Middy Peak Hours
Ottawa, Ontario

Figure
12

3.2 BACKGROUND NETWORK TRAFFIC

This section discusses the approach and assumptions applied in the development of future year background condition traffic volumes.

3.2.1 Transportation Network Plans

Refer to 2.1.3 Planned Conditions for discussion related to planned improvements in the project vicinity.

3.2.2 Background Growth

The year 2027 background growth without Project traffic volumes reflect existing year 2025 traffic counts plus two (2) years of annual background growth, proposed to be developed by the application of 2.0% annual growth applied to all approaches of the Innes Road / Cyrville Road intersection except for the southern leg, where no potential growth is anticipated. The identified 2.0% annual growth rate has been identified from a review of MTO historical traffic count data on Highway 417 and a review of Ottawa population growth based on census data and forecasted population and household projections.

3.2.3 Other Developments

Per Section 2.1.3, no additional post approval developments fall within a 1.0 kilometre radius from the project site.



Section 3

Strategy Report

4.1 DEVELOPMENT DESIGN

This section discusses the proposed transportation elements on the development property related to all users.

4.1.1 Design for Sustainable Modes

VEHICLE & BICYCLE

The existing Costco Business Centre site currently provides a total of 603 parking stalls, where 14 are designated as loading stalls, 20 are designated as accessible stalls, and 20 are designated as delivery truck stalls. With the addition of the fuel facility, the total number of available parking stalls is reduced by 125 stalls to a new total of 478 stalls where 14 are designated as loading stalls, 20 are designated as accessible stalls, and 20 are designated as delivery truck stalls. With the reduction in parking stalls, the site still meets the minimum 400 stalls required per City By-Law.

Bicycle parking is provided at the existing Gloucester Costco Business Centre site in the southwest corner of the warehouse and is to remain unchanged with the Project.

TRANSIT

OC Transpo provides transit services across Ottawa, including train and bus services. Within the study area transit facilities provided include an existing bus stop provided in the eastbound direction on the east leg of the Innes Road / Cyrville Road. Bus routes through this stop include local routes 26 and 42. A bus stop is also provided in the southbound direction on the north leg of the Innes Road / Cyrville Road intersection served by local routes 26 and 42. The existing transit stops and facilities are to remain unchanged with the Project.

PEDESTRIANS

Within the project vicinity, sidewalks are provided along both sides of Innes Road. A retaining wall with railing is present along the entirety of the Innes Road frontage. Along Cyrville Road, sidewalks are provided on both sides of the corridor north of the Innes Road / Cyrville Road intersection, and south of the intersection sidewalks are only provided to the first private driveways on either side. As part of the Project, Costco is planning to construct an extension of the existing sidewalk on the west side of Cyrville Road south to the existing middle access driveway, as shown in Figure 2.

4.1.2 Circulation & Access

The existing Costco Business Centre is currently served by three (3) accesses along Cyrville Road – one (1) right-in only access, two (2) full movement accesses. The Project proposes to close the existing right-in access closest to Cyrville Road and construct one (1) new full movement access to be located approximately 140 metres south of Innes Road and 50 metres north of the existing middle driveway. The new access will provide a single receiving lane and a shared left-through-right lane onto Cyrville Road and will be designed and constructed to meet the City of Ottawa By-Law requirements. Business Centre will use the new driveway

and continue to circulate and exit the site as they do today (around the back of the Business Centre to the loading dock area and exiting via the existing middle driveway).

Costco fuel trucks will also enter via the new northern-most driveway to the site to a designated external drop area (outside of the gas bar queuing area), then continue around the warehouse to exit the site at the existing middle driveway. Fuel truck turning templates are included in the site plan depiction shown in Figure 2. In general, Business Centre fuel facilities generate fewer trips/demand compared to Costco Warehouse locations. It is anticipated that the Gloucester Business Centre will receive one (1) (occasionally two) fuel truck deliveries per day on average. Efforts are made to coordinate deliveries outside of peak business periods, but ultimately deliveries are driven by need so a delivery truck may arrive at any time throughout the day.

Fuel truck arrivals, regardless of time, do not have a substantial impact to on-site operations or circulation. The gas bar is designed with a designated fuel drop location that allows the truck to deliver fuel without impacting drive aisles or circulation/parking. The fuel truck is routed around the perimeter of the site and intentionally avoids the areas closest to the Business Centre entrance where concentration of vehicular and pedestrian activity is highest.

4.1.3 New Street Networks

Exempt – Please refer to Section 2.3 Exemption review.

4.2 PARKING

This section discusses the parking impacts associated with the gas bar addition to the existing Costco Business Centre site.

4.2.1 Parking Supply

The existing Costco Business Centre site currently provides a total of 604 parking stalls, where 14 are designated as loading stalls, 20 are designated as accessible stalls, and 20 are designated as delivery truck stalls. With the addition of the fuel facility, the total number of available parking stalls is reduced by 125 stalls to a new total of 478 stalls where 14 are designated as loading stalls, 20 are designated as accessible stalls, and 20 are designated as delivery truck stalls. The number of stalls required by the City's minimum By-Law (3.4 stalls per 100 square metres) is a total of 400 stalls, and based on this minimum requirement, the Project's proposed number of parking stalls with the addition of the gas bar still exceeds the minimum number of stalls required.

At the request of staff, a parking utilization study was conducted at the existing Costco Business Centre to evaluate if the reduction in the number of available parking stalls would accommodate the existing parking demand. This parking supply study counted the number of occupied parking stalls in 30-minute increments

⁴ The existing Costco Business Centre As-Built shows a total of 603 existing parking stalls. The parking utilization data collection effort identified a total of 590 parking stalls available. For conservative analysis, parking utilization was calculated based on the 590 counted parking stalls.

from 7 AM to 7 PM for both weekday and Saturday conditions. **Table 12** provides a summary of the existing and proposed parking utilization based on the existing parking data collected.

As shown, under existing weekday conditions the parking lot is 23% utilized during the corresponding roadway network weekday AM peak hour (7:30 AM), 31% utilized during the roadway network PM peak hour (4:15 PM), and 54% utilized during the peak hour of heaviest weekday parking demand (11:00 AM). Under existing Saturday conditions, the parking lot is 62% utilized during the corresponding roadway network Saturday midday peak hour (1:00 PM), and 68% utilized during the peak hour of heaviest Saturday parking demand (3:00 PM).

Under the proposed condition with the Project in place, the parking lot is forecast to be 28% utilized during the corresponding roadway network weekday AM peak hour (7:30 AM), 39% utilized during the roadway network PM peak hour (4:15 PM), and 66% utilized during the peak hour of heaviest weekday parking demand (11:00 AM). Under proposed Saturday conditions, the parking lot is forecast to be 76% utilized during the corresponding roadway network Saturday midday peak hour (1:00 PM), and 84% utilized during the peak hour of heaviest Saturday parking demand (3:00 PM).

Table 12. Existing & Proposed Gloucester Costco Business Centre Parking Utilization

Time	Existing		Proposed	
	Weekday	Saturday	Weekday	Saturday
Inventory	590		478	
7:00 AM	17%	13%	21%	16%
7:30 AM	23%	20%	28%	24%
8:00 AM	25%	26%	31%	33%
8:30 AM	28%	28%	35%	34%
9:00 AM	30%	32%	37%	39%
9:30 AM	36%	37%	44%	46%
10:00 AM	46%	41%	57%	50%
10:30 AM	48%	49%	60%	60%
11:00 AM	54%	50%	66%	62%
11:30 AM	47%	59%	58%	73%
12:00 PM	49%	62%	61%	77%
12:30 PM	48%	62%	59%	76%
1:00 PM	42%	62%	51%	76%
1:30 PM	44%	61%	55%	76%
2:00 PM	42%	63%	51%	78%
2:30 PM	38%	66%	47%	81%
3:00 PM	37%	68%	46%	84%
3:30 PM	37%	61%	46%	75%
4:00 PM	31%	56%	39%	69%
4:30 PM	30%	50%	37%	62%
5:00 PM	28%	48%	35%	59%
5:30 PM	34%	40%	42%	50%
6:00 PM	24%	25%	30%	31%
6:30 PM	9%	5%	12%	6%

In general, parking is considered to be “full” at approximately 85-90% occupancy, as described in the ITE Parking Generation Manual. This is to allow for ease of circulation, parking availability, and to account for variations in parking turnover. Therefore, under existing and proposed conditions, the overall site operates and is forecast to operate within the recommended parking supply during weekday and Saturday.

4.2.2 Spillover Parking

Exempt – Please refer to Section 2.3 Exemption review.

4.3 BOUNDARY STREET DESIGN

The boundary street for this project, as well as for the existing Gloucester Costco Business Centre site, is Cyrville Road. At this time, there is no complete street concept for Cyrville Road south of Innes Road.

This segment of Cyrville Road south of Innes Road is currently classified as a Local Road, with a single travel lane in each the north and south direction. This segment currently serves the existing businesses that access Cyrville Road and currently there are no plans for further connections to the south.

As part of the gas bar addition Project, Costco is planning to construct improved sidewalk facilities along the site frontage from Innes Road to the middle driveway. The installation of the sidewalk construction and extension is consistent with the Complete Streets Program with the intent to enable safe, comfortable, and barrier-free access for all users.

SEGMENT MMLOS ANALYSIS

Table 13 presents the roadway segment MMLOS operational results for the roadway segment of Cyrville Road south of Innes Road along the site frontage under year 2025 existing conditions and year 2027 build out conditions with the addition of Project proposed sidewalk improvements along the west side. Transit MMLOS was not evaluated along this segment of Cyrville Road as transit service is not provided south of Innes Road. **Appendix E** includes all MMLOS worksheets.

Table 13. Multi-Modal Level of Service along Cyrville Road South of Innes Road

Scenario	Pedestrian LOS		Bicycle LOS		Public Realm LOS	
	PLOS	Target	BLOS	Target	PRLOS	Target
Year 2025 Existing Conditions	F	C	D	C	D	D
Year 2027 Build Out Conditions	B	C	D	C	C	D

As shown in Table 13, comparing the MMLOS results between existing conditions and year 2027 build-out conditions demonstrate the improved Pedestrian LOS associated with the addition of the Project proposed sidewalk improvement on the W side of Cyrville Road, and the subsequent improvement to Public Realm LOS. As no changes are proposed to the existing shared-use bicycle facility, no changes in the Bicycle LOS are anticipated.

4.4 ACCESS INTERSECTION DESIGN

This section discusses the proposed site access intersections and traffic control designs and considerations.

4.4.1 Location & Design of Access

The existing Costco Business Centre has three (3) driveways on Cyrville Road. The northern access (approximately 55 metres south of Innes Road) is currently restricted to right-in movements by a raised median on Cyrville Road. The other two (2) driveways provide full access – the first located approximately 190 metres south of Cyrville Road, and the southernmost (serving the parking area south of the creek) approximately 300 metres south of Cyrville Road. Along Cyrville Road there are private driveways that provide direct access to the Innes Plaza retail center and the Dufresne Furniture Store. The Project proposes to close the existing right-in access to Cyrville Road and construct one (1) new full movement access to be located approximately 140 metres south of Innes Road and 50 metres north of the existing middle driveway.

The proposed closure of one (1) existing access and the introduction of a new full-movement access to the site ensure all access locations are no longer within the existing area of influence of the Cyrville Road / Innes Road intersection. The proposed location of the new full-movement Costco driveway is between the existing two (2) driveways serving the Dufresne Furniture Store on the east side of Cyrville Road. The proposed new Costco driveway is offset from these two (2) existing access driveways as much as possible while maintaining appropriate on-site circulation and parking. Drivers exiting these driveways onto Cyrville Road have good visibility and given the relatively low volumes along Cyrville Road minimal conflicts are expected with the proposed driveway offset.

The Transportation Associate of Canada's *Geometric Design Guide for Canadian Roads* (TAC) and City of Ottawa By-Laws for private approaches were reviewed to inform the new proposed driveway location. As noted, the Project is relocating an existing driveway intersection that currently exists within the downstream functional area of the Innes Road/Cyrville Road. This relocation locates the new driveway outside of the downstream functional area and represents a net improvement relative to existing conditions, even with the projected moderate increase in traffic volumes associated with the gas bar addition. Further, the new proposed driveway includes a throat depth exceeding the minimum eight (8) metres required by the TAC for Discount Store driveways along Collector Roadways and prevents driveway queues from interfering/impeding on-site circulation.

4.4.2 Intersection Control

From a review of existing site accesses along Cyrville Road and the projected traffic volumes at site driveways, minor approach stop-control is recommended for the proposed new Costco driveway with no additional turn lanes. No control changes are recommended for the existing driveway access intersections.

4.5 TRANSPORTATION DEMAND MANAGEMENT

Exempt – Please refer to Section 2.3 Exemption review.

4.6 NEIGHBORHOOD TRAFFIC MANAGEMENT

Exempt – Please refer to Section 2.3 Exemption review.

4.7 TRANSIT

This section discusses the potential impacts the Project may have on existing and future transit networks and service in the site vicinity.

4.7.1 Route Capacity

Exempt – Please refer to Section 2.3 Exemption review.

4.7.2 Transit Priority

The Project proposes to construct a gas bar facility at the existing Gloucester Costco Business Centre. The installation of a gas bar is not anticipated to generate any transit trips as a gas bar facility exclusively generates vehicle trips.

Within the study area transit facilities provided include an existing bus stop provided in the eastbound direction on the east leg of the Innes Road / Cyrville Road, and a bus stop in the southbound direction on the north leg of the Innes Road / Cyrville Road intersection. As growth occurs in the surrounding area and trips associated with the Project traverse the roadway network, the transit network will be further developed as a result of the identified planned improvements.

These improvements include transit signal priority and queue jump lanes at select intersections along Innes Road and Blair Road, as well as continuous bus lanes on Blair Road, as discussed in Section 2.1.3. No additional transit improvements other than those previously discussed are proposed.

4.8 REVIEW OF NETWORK CONCEPT

Exempt – Please refer to Section 2.3 Exemption review.

4.9 INTERSECTION DESIGN

This section outlines the operational results under existing, background, and total conditions for the future build out year 2027 and the future year 2032 conditions.

Year 2025 Existing Conditions

Peak hour turning movement counts were collected in June 2025 during the weekday AM (7:00 AM – 9:00 AM), weekday PM (4:00 PM – 7:00 PM), and Saturday midday (11:00 AM – 2:00 PM) peak periods. Existing peak hour traffic operations were analyzed for typical weekday AM, weekday PM, and Saturday midday peak hours using balanced, system-wide peak hour vehicle traffic volumes presented previously in Figure 5 and pedestrian and bicycle volumes presented previously in Figure 6. **Appendix D** includes the existing traffic signal timing data applied to this analysis.

INTERSECTION MMLOS ANALYSIS

Table 14 presents the year 2025 existing MMLOS operational results for pedestrian, bicycle, and transit LOS at traffic signal-controlled study intersections based on the existing facilities available at each location in an Outer Urban Policy Area. **Appendix E** includes all MMLOS analysis worksheets.

Table 14. Multi-Modal Level of Service at Signalized Study Intersections

Intersection	Pedestrian LOS		Bicycle LOS		Transit LOS	
	PLOS	Target	BLOS	Target	TLOS	Target
1. Highway 417 SB Ramp / Innes Road	D	C	E	C	-	-
2. Highway 417 NB Ramp / Innes Road	D	C	D	C	-	-
3. Innes Crossing / Innes Road	C	C	D	C	-	-
4. Cyrville Road / Innes Road	E	C	D	C	F	E
5. Stonehenge Crescent / Innes Road	C	C	C	C	B	E

As shown Table 14, several locations exceed the identified pedestrian, bicycle, or transit LOS target. The intersections exceeding the pedestrian LOS target all require pedestrians to cross six (6) or more lanes on the major and/or minor street approaches of the intersection. There are no improvements beyond the reduction in number of lanes to be crossed that would improve pedestrian LOS to meet the identified target.

The bicycle LOS target is exceeded at most intersections due to a lack of left-turn bicycle boxes on the major and minor street approaches, and a general lack of dedicated bicycle facilities on the minor streets except for Cyrville Road, which provides bike lane facilities north of Innes Road.

Transit LOS is only applicable at the intersections of Cyrville Road and Stonehenge Crescent with Innes Road as the only intersections that experience transit traffic. At the intersection of Innes Road / Cyrville Road, the transit LOS exceeds the LOS E target as the average southbound approach delay exceeds 80 seconds under existing conditions. Traffic signal timing to provide additional green time to the southbound approach may improve the Transit LOS score at this location but would require reprioritization of the minor street approaches, resulting in undesirable intersection operations as Innes Road approach delays would increase.

Given that there are limited potential improvements beyond those previously identified in Section 2.1.3 Planned Conditions, no modifications are recommended as part of this Project. Furthermore, as the Project is not anticipated to generate any additional pedestrian, bicycle, or transit trips, no additional future year MMLOS is conducted as part of this analysis.

TRAFFIC OPERATIONS AND AUTO LOS

Table 15 presents the overall intersection operational results including intersection volume-to-capacity ratio (v/c), intersection Auto LOS, individual movement v/c, and movement 95th percentile queue for each study intersection under year 2025 existing conditions during the weekday AM, weekday PM, and Saturday midday peak hours. **Appendix F** includes the year 2025 existing conditions Synchro worksheets.

Table 15. Year 2025 Existing Intersection & Movement Operations Summary

Intersection	Traffic Control	Overall Intersection (AM / PM / SAT)		Movement Summary (AM / PM / SAT)		
		v/c ¹	Auto LOS ²	Movement	v/c	95 th Percentile Queue (m)
1. Highway 417 SB Ramp / Innes Road	Traffic Signal	0.70 / 0.72 / 0.56	B / C / A	EBT	0.29 / 0.64 / 0.43	38.9 / 151.3 / 62.8
				WBT	0.68 / 0.39 / 0.44	86.1 / 35.4 / 63.7
				SBL	0.87 / 0.90 / 0.87	74.7 / 144.9 / 88.6
2. Highway 417 NB Ramp / Innes Road	Traffic Signal	0.75 / 0.65 / 0.58	C / B / A	EBT	0.35 / 0.65 / 0.51	33.1 / 125.8 / 64.5
				WBT	0.73 / 0.39 / 0.45	12.8 / 4.1 / 5.9
				NBL	0.87 / 0.75 / 0.67	83.6 / 33.2 / 25.9
3. Innes Crossing / Innes Road	Traffic Signal	0.83 / 0.69 / 0.74	D / B / C	EBL	1.66 / 0.85 / 1.23	117.3 / 65.4 / 103.1
				EBTR	0.43 / 0.82 / 0.75	84.6 / 215.8 / 141.7
				WBL	0.72 / 0.66 / 0.62	10.0 / 8.9 / 5.7
				WBT	1.01 / 0.65 / 1.09	41.7 / 38.5 / 34.8
				WBR	0.06 / 0.09 / 0.24	0.0 / 1.1 / 1.1
				NBLTR	0.25 / 0.21 / 0.15	38.6 / 30.8 / 17.4
				SBL	0.10 / 0.20 / 0.20	19.9 / 33.3 / 31.0
				SBT	0.01 / 0.03 / 0.02	3.7 / 8.4 / 5.1
				SBR	0.31 / 0.40 / 0.46	21.8 / 16.9 / 16.4
4. Cyrville Road / Innes Road	Traffic Signal	0.80 / 0.87 / 0.74	C / D / C	EBL	1.00 / 0.81 / 0.79	81.1 / 28.7 / 31.7
				EBT	0.41 / 1.14 / 1.10	26.1 / 273.6 / 139.9
				WBL	0.79 / 0.82 / 0.87	20.6 / 55.3 / 76.5
				WBT	1.01 / 0.67 / 1.09	323.8 / 125.4 / 179.7
				NBL	1.04 / 0.52 / 1.15	56.0 / 42.5 / 75.5
				NBT	0.20 / 0.13 / 0.16	33.8 / 24.7 / 26.4
				NBR	0.14 / 0.33 / 0.39	0.0 / 14.3 / 15.0
				SBL	0.69 / 1.29 / 0.73	32.4 / 131.6 / 40.6
				SBT	0.08 / 0.27 / 0.13	17.4 / 44.2 / 21.5

Intersection	Traffic Control	Overall Intersection (AM / PM / SAT)		Movement Summary (AM / PM / SAT)		
		v/c ¹	Auto LOS ²	Movement	v/c	95 th Percentile Queue (m)
5. Stonehenge Crescent / Innes Road	Traffic Signal	0.75 / 0.70 / 0.56	C / B / A	EBL	0.63 / 0.79 / 0.78	13.4 / 15.7 / 14.8
				EBTR	0.32 / 0.76 / 0.50	10.8 / 51.6 / 20.9
				WBL	0.80 / 0.79 / 0.78	35.3 / 29.8 / 27.2
				WBTR	0.79 / 0.44 / 0.59	227.8 / 82.6 / 114.3
				NBLTR	0.20 / 0.42 / 0.41	14.2 / 25.4 / 22.1
				SBL	0.09 / 0.10 / 0.12	12.1 / 13.3 / 13.5
				SBTR	0.54 / 0.32 / 0.37	18.7 / 15.0 / 13.4
6. Costco Business Centre N Driveway / Cyrville Road	TWSC	0.19 / 0.10 / 0.15	A / A / A	WBR	0.19 / 0.10 / 0.15	7.6 / 7.6 / 7.6
				SBTR	0.05 / 0.05 / 0.02	7.6 / 7.6 / 7.6
7. Costco Business Centre New Driveway / Cyrville Road	TWSC	Intersection Not Applicable Under This Scenario				
8. Costco Business Centre Central Driveway / Cyrville Road	TWSC	0.16 / 0.43 / 0.55	A / A / A	EBLR	0.16 / 0.43 / 0.55	7.6 / 22.9 / 34.3
				NBTL	0.002 / 0.002 / 0.001	0.0 / 0.0 / 0.0

¹ Overall intersection v/c ratio for traffic signal reported from HCM 2000 Synchro Report. Overall intersection v/c ratio for unsignalized control reported from critical movement HCM 6th Edition Synchro Report. ² Auto LOS calculated according to City of Ottawa MMLOS Guidelines.

As demonstrated in Table 15, all study intersections operate within the identified Outer Urban Auto LOS threshold of LOS E or better under year 2025 existing conditions. While all intersections operate LOS D or better and under capacity, there are some movements operating overcapacity (v/c > 1.00) at the following locations:

- **Innes Crossing / Innes Road:** During the weekday AM and Saturday midday peak hours, the eastbound left-turn and westbound through movements operate over capacity.
- **Cyrville Road / Innes Road:** During the weekday AM peak hour, the westbound through and northbound left-turn movements operate over capacity. During the weekday PM peak hour, the eastbound through and southbound left-turn movements operate over capacity. During the Saturday midday peak hour, the eastbound through, westbound through, and northbound left-turn movements operate over capacity.

While these identified individual movements operate over capacity, the overall intersection operations meet City of Ottawa Auto LOS thresholds. Movement operations and queuing may be further improved with

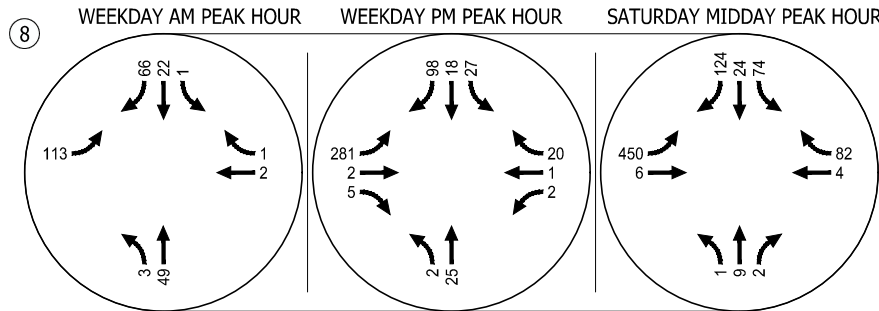
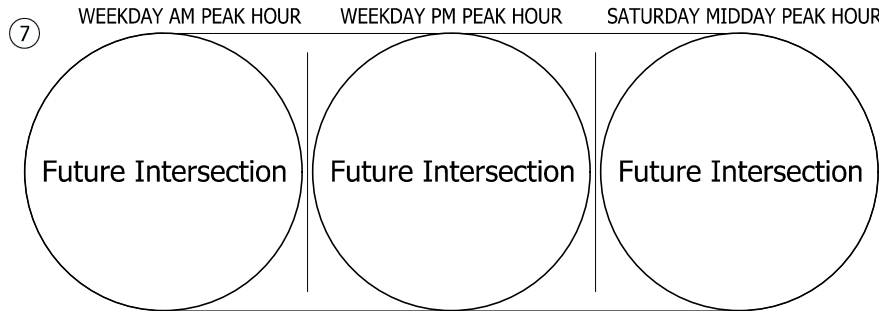
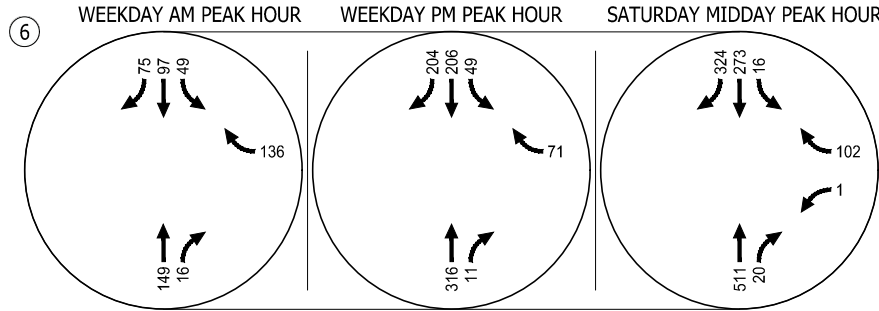
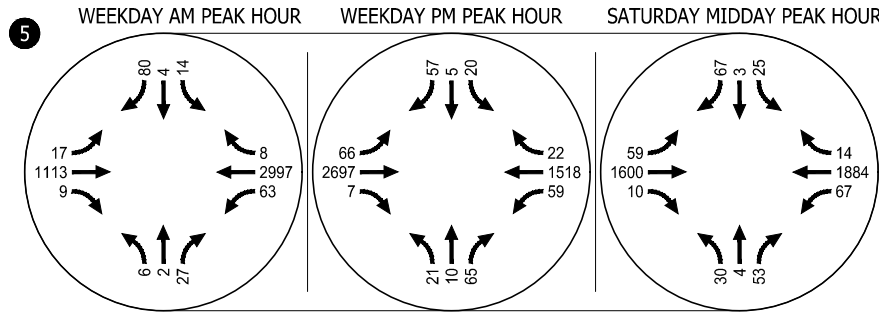
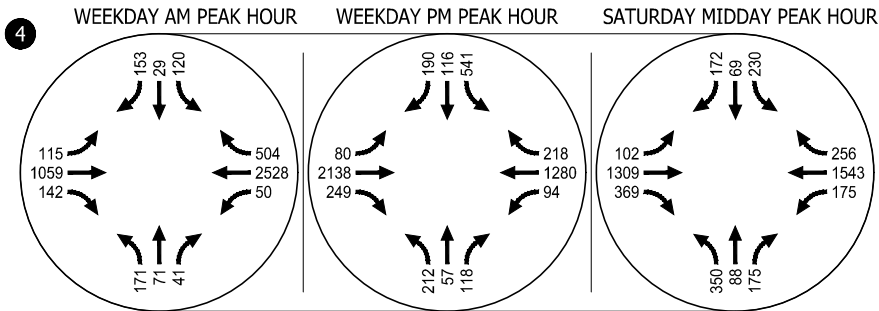
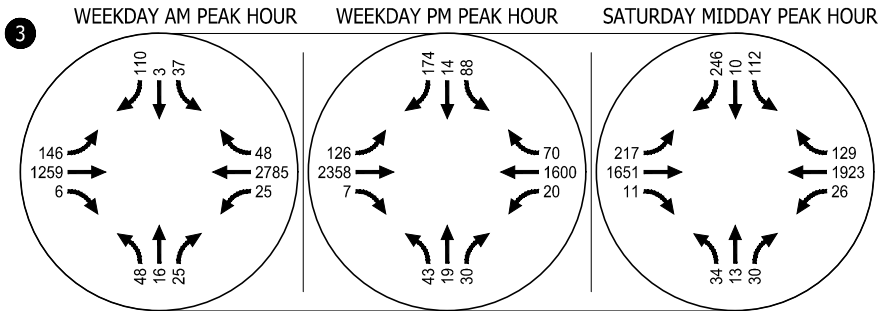
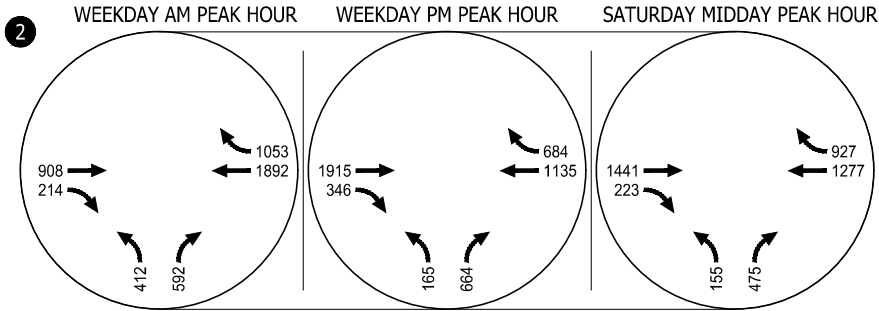
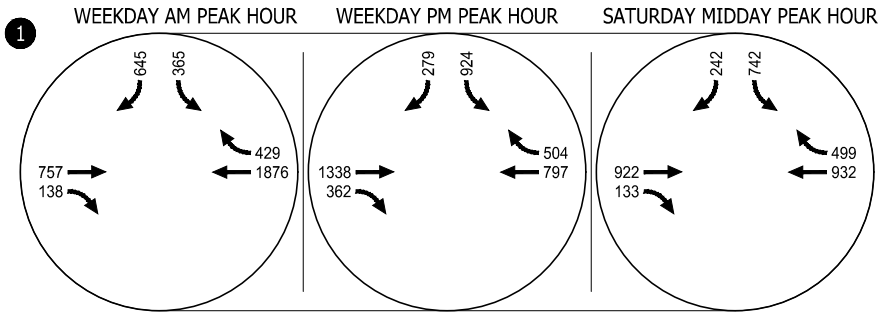
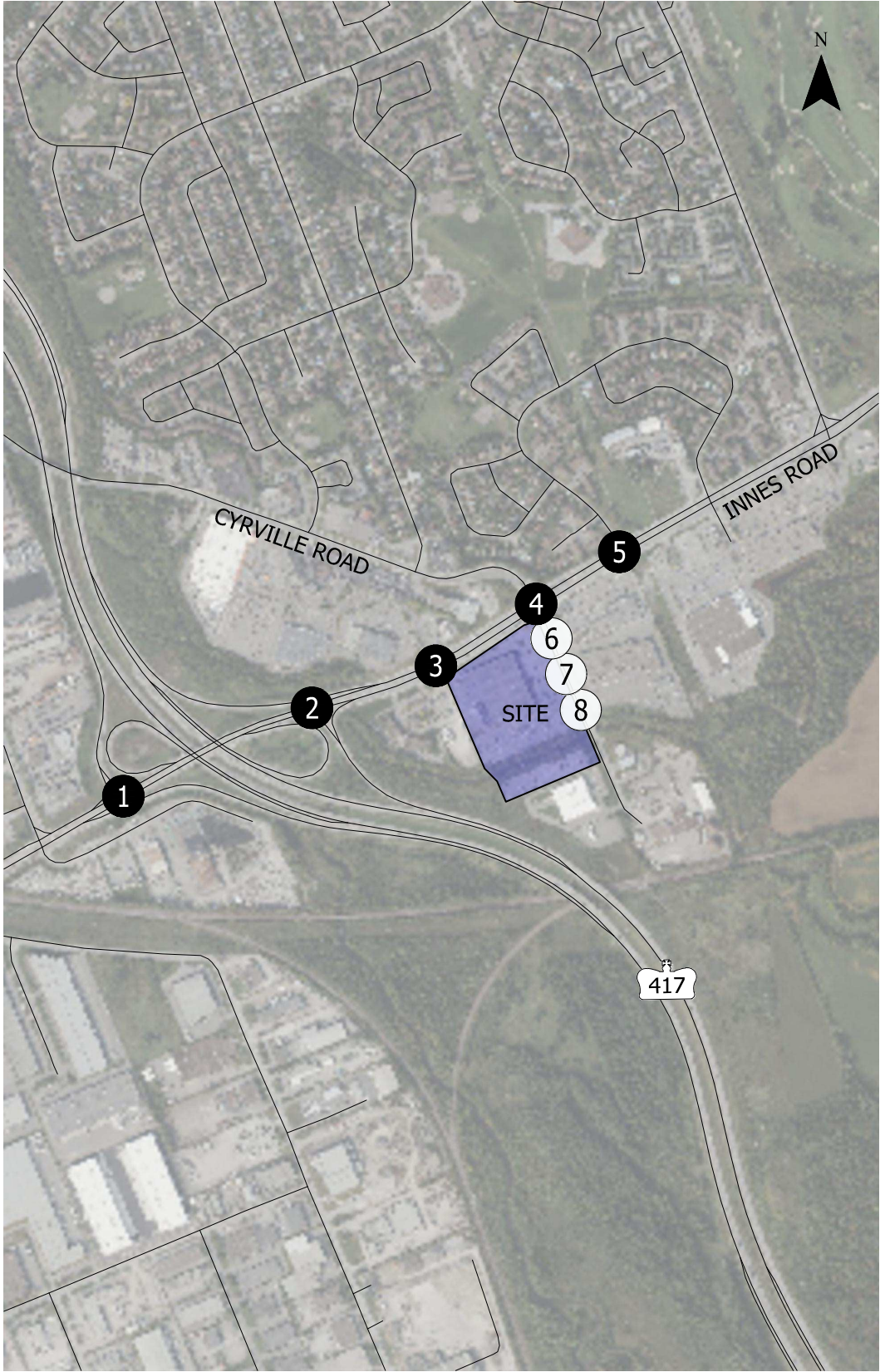
traffic signal timing adjustments to provide additional green time to the minor street approaches while still maintaining coordinated signal timing along the Innes Road corridor.

Year 2027 Background Conditions

As there are no significant proposed geometric changes to the existing pedestrian and bicycle infrastructure in the site vicinity in year 2027, the multi-modal level of service (MMLOS) remains the same as under year 2025 Existing Conditions, outlined in Table 14.

Figure 13 summarizes the year 2027 background condition traffic volumes for the weekday AM, weekday PM, and Saturday midday peak hours. **Table 16** presents the overall intersection operational results including intersection v/c, intersection Auto LOS, individual movement v/c, and movement 95th percentile queue for each study intersection under year 2027 background conditions during the weekday AM, weekday PM, and Saturday midday peak hours. **Appendix G** includes the year 2027 background conditions *Synchro* worksheets.

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- Study Intersection
- Study Site Access

Year 2027 Background Vehicle Traffic Volumes
Weekday AM, Weekday PM, Saturday MIDDAY Peak Hours
Ottawa, Ontario

Figure
13

Table 16. Year 2027 Background Intersection & Movement Operations Summary

Intersection	Traffic Control	Overall Intersection (AM / PM / SAT)		Movement Summary (AM / PM / SAT)		
		v/c ¹	Auto LOS ²	Movement	v/c	95 th Percentile Queue (m)
1. Highway 417 SB Ramp / Innes Road	Traffic Signal	0.71 / 0.73 / 0.56	C / C / A	EBT	0.29 / 0.65 / 0.43	39.8 / 153.2 / 62.7
				WBT	0.69 / 0.40 / 0.44	84.6 / 34.8 / 63.5
				SBL	0.88 / 0.91 / 0.87	76.2 / 147.0 / 88.5
2. Highway 417 NB Ramp / Innes Road	Traffic Signal	0.74 / 0.67 / 0.59	C / B / A	EBT	0.35 / 0.67 / 0.51	32.2 / 137.0 / 65.1
				WBT	0.72 / 0.40 / 0.45	12.6 / 4.3 / 6.0
				NBL	0.87 / 0.75 / 0.67	82.7 / 33.9 / 26.0
3. Innes Crossing / Innes Road	Traffic Signal	0.81 / 0.70 / 0.74	D / C / C	EBL	1.62 / 0.85 / 1.22	114.3 / 66.3 / 102.2
				EBTR	0.42 / 0.84 / 0.75	80.1 / 232.3 / 141.2
				WBL	0.70 / 0.66 / 0.61	8.6 / 8.9 / 5.3
				WBT	0.99 / 0.67 / 1.09	33.5 / 39.1 / 33.6
				WBR	0.05 / 0.09 / 0.24	0.0 / 1.0 / 1.0
				NBLTR	0.23 / 0.21 / 0.14	36.5 / 30.8 / 16.9
				SBL	0.10 / 0.21 / 0.20	19.6 / 33.8 / 30.8
				SBT	0.01 / 0.03 / 0.02	3.7 / 8.4 / 5.1
				SBR	0.30 / 0.41 / 0.46	20.9 / 17.4 / 16.4
4. Cyrville Road / Innes Road	Traffic Signal	0.81 / 0.88 / 0.74	D / D / C	EBL	1.02 / 0.81 / 0.79	82.4 / 28.4 / 31.8
				EBT	0.42 / 1.15 / 1.10	26.3 / 282.1 / 141.6
				WBL	0.79 / 0.81 / 0.87	20.3 / 54.1 / 73.4
				WBT	1.03 / 0.68 / 1.10	335.0 / 128.7 / 181.8
				NBL	1.02 / 0.51 / 1.11	55.0 / 41.8 / 72.5
				NBT	0.19 / 0.13 / 0.16	33.5 / 24.2 / 25.5
				NBR	0.13 / 0.32 / 0.38	0.0 / 13.9 / 14.8
				SBL	0.70 / 1.32 / 0.74	33.8 / 134.8 / 41.3
				SBT	0.08 / 0.26 / 0.12	16.8 / 43.4 / 21.0

Intersection	Traffic Control	Overall Intersection (AM / PM / SAT)		Movement Summary (AM / PM / SAT)		
		v/c ¹	Auto LOS ²	Movement	v/c	95 th Percentile Queue (m)
5. Stonehenge Crescent / Innes Road	Traffic Signal	0.75 / 0.71 / 0.55	C / C / A	EBL	0.63 / 0.79 / 0.78	12.8 / 15.6 / 14.4
				EBTR	0.31 / 0.78 / 0.49	10.7 / 51.6 / 18.9
				WBL	0.80 / 0.79 / 0.78	35.4 / 30.0 / 26.9
				WBTR	0.79 / 0.45 / 0.57	227.1 / 85.7 / 109.4
				NBLTR	0.20 / 0.43 / 0.40	14.2 / 26.0 / 21.9
				SBL	0.09 / 0.10 / 0.11	12.1 / 13.5 / 13.1
				SBTR	0.54 / 0.32 / 0.37	18.7 / 15.2 / 13.4
6. Costco Business Centre N Driveway / Cyrville Road	TWSC	0.14 / 0.12 / 0.20	A / A / A	WBR	0.14 / 0.08 / 0.14	7.6 / 7.6 / 7.6
				SBTR	0.04 / 0.04 / 0.02	7.6 / 7.6 / 7.6
7. Costco Business Centre New Driveway / Cyrville Road	TWSC	Intersection Not Applicable Under This Scenario				
8. Costco Business Centre Central Driveway / Cyrville Road	TWSC	0.13 / 0.31 / 0.50	A / A / A	EBLR	0.13 / 0.32 / 0.50	7.6 / 22.9 / 30.5
				NBTL	0.01 / 0.0 / 0.0	0.0 / 0.0 / 0.0

¹ Overall intersection v/c ratio for traffic signal reported from HCM 2000 Synchro Report. Overall intersection v/c ratio for unsignalized control reported from critical movement HCM 6th Edition Synchro Report. ² Auto LOS calculated according to City of Ottawa MMLOS Guidelines.

As demonstrated in Table 16, all study intersections are forecast to continue to operate within the identified Outer Urban Auto LOS threshold of LOS E or better under year 2027 background conditions. While all intersections operate LOS D or better and under capacity, there are some movements projected to operate over capacity (v/c > 1.00) at the following locations:

- **Innes Crossing / Innes Road:** During the weekday AM the eastbound left-turn movement operates over capacity, and during the Saturday midday peak hour, the eastbound left-turn and westbound through movements operate over capacity.
- **Cyrville Road / Innes Road:** During the weekday AM peak hour, the westbound through, eastbound left-turn, and northbound left-turn movements operate over capacity. During the weekday PM peak hour, the eastbound through and southbound left-turn movements operate over capacity. During the Saturday midday peak hour, the eastbound through, westbound through, and northbound left-turn movements operate over capacity.

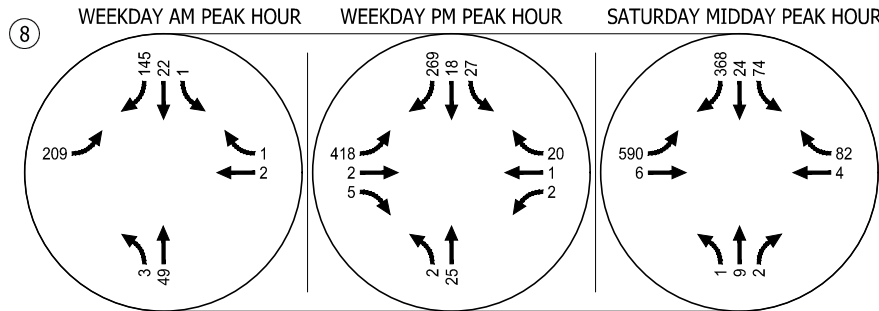
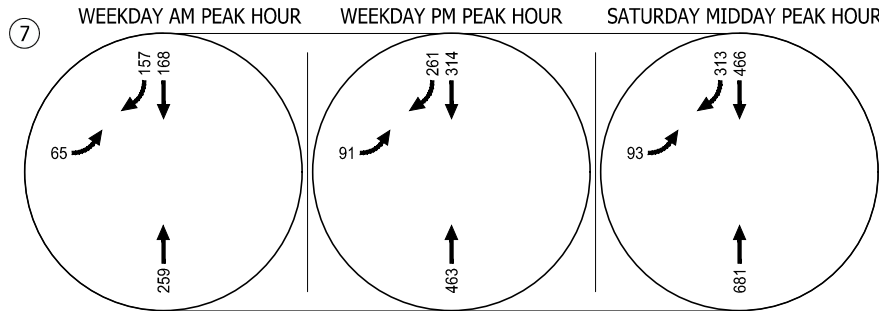
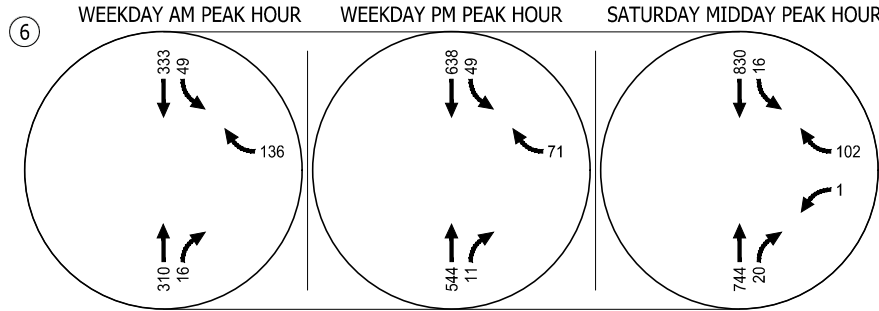
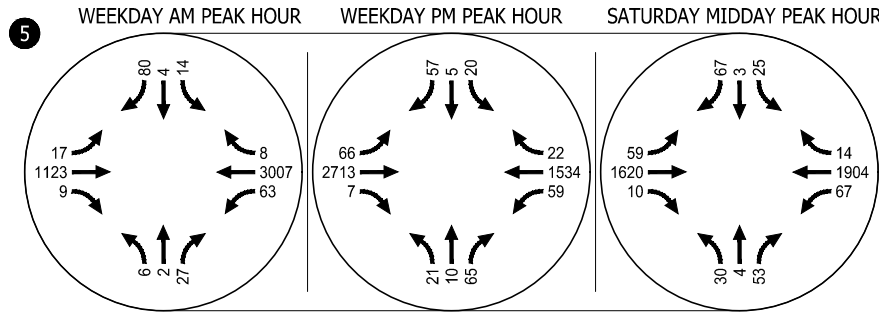
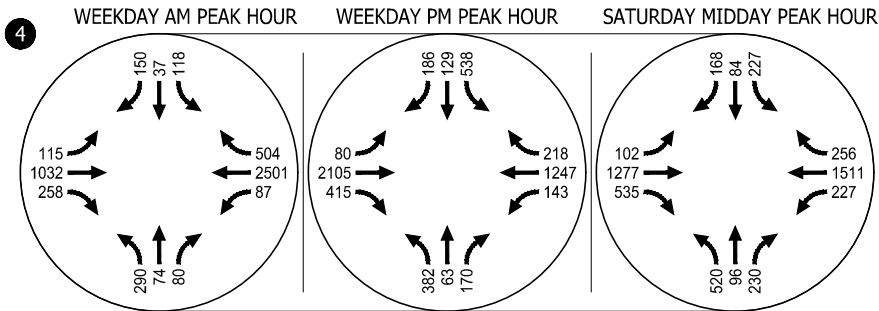
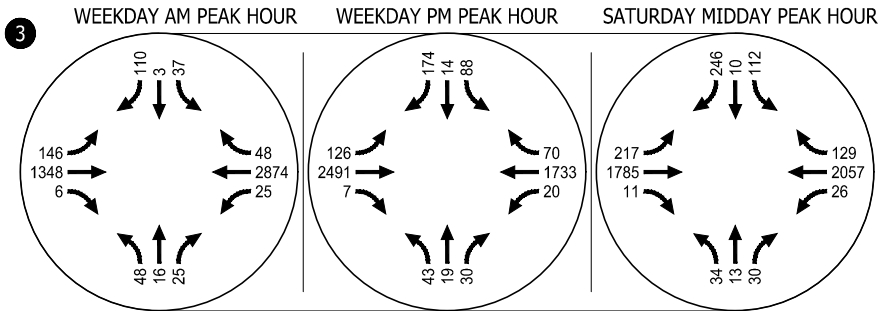
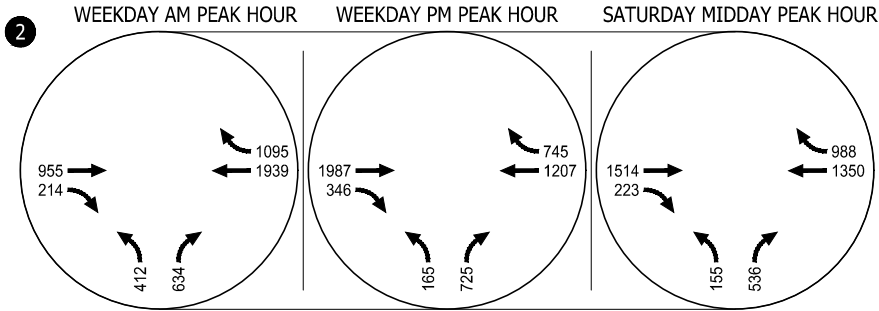
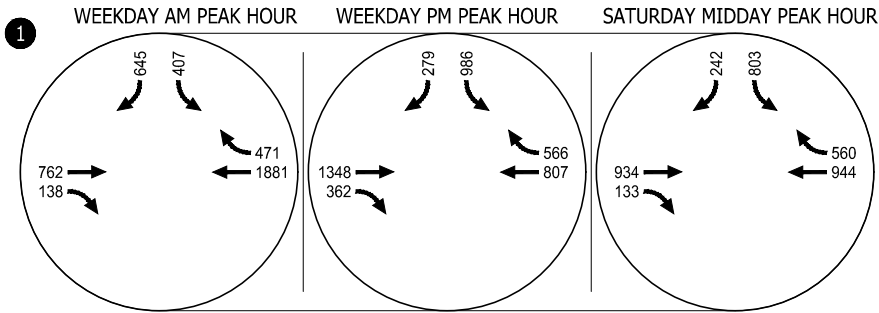
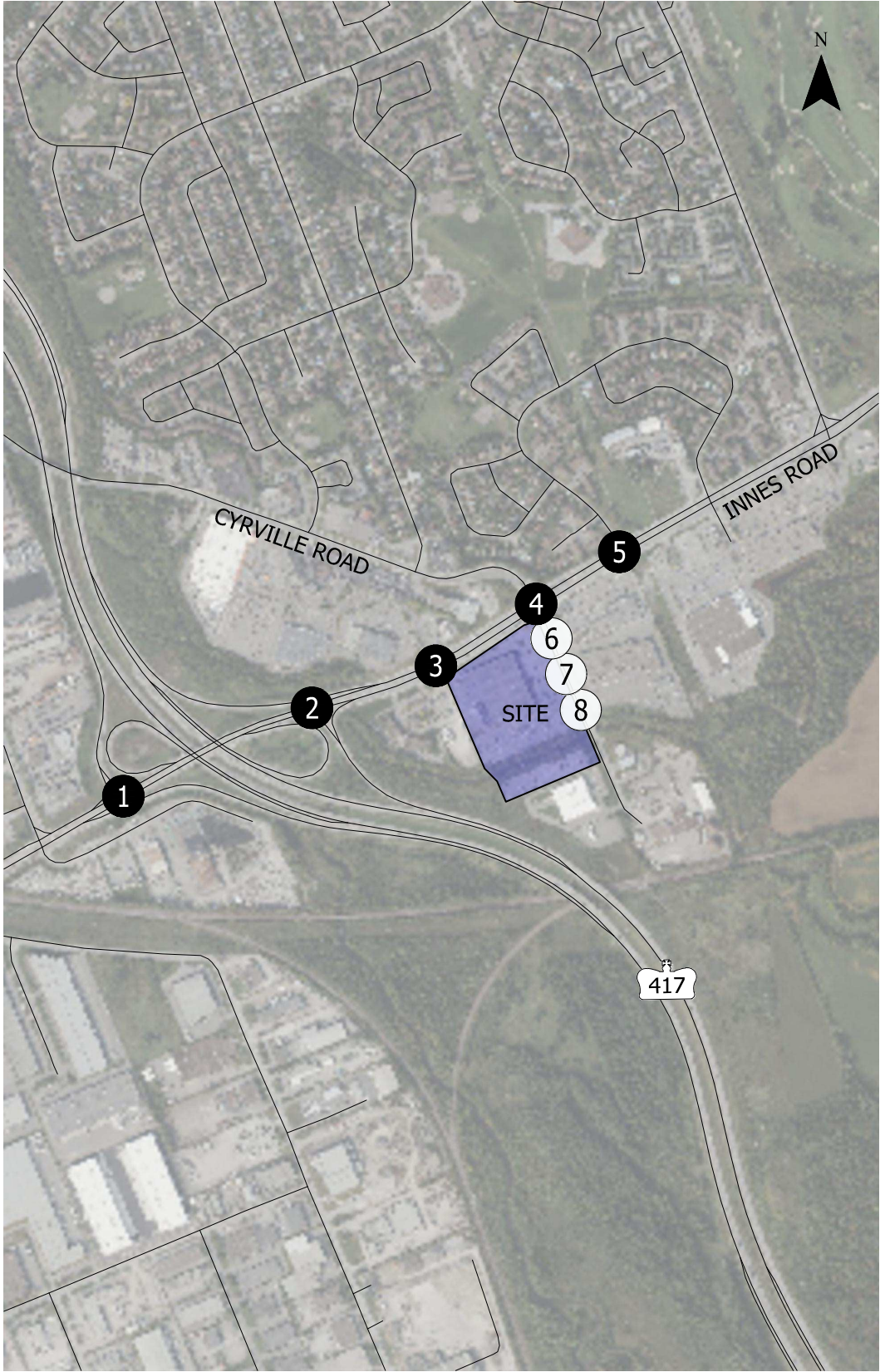
Similar to year 2025 existing conditions, while these identified movements are projected to operate over capacity, the overall intersection operations meet City of Ottawa Auto LOS thresholds. Movement operations and queuing may be further improved with traffic signal timing adjustments to provide additional green time to the minor street approaches while still maintaining coordinated signal timing along the Innes Road corridor.

Year 2027 Total Conditions

As there are no significant proposed geometric changes to the existing pedestrian and bicycle infrastructure in the site vicinity in year 2027, the multi-modal level of service (MMLOS) remains the same as under year 2025 Existing Conditions, outlined in Table 14.

Figure 14 summarizes the year 2027 total condition traffic volumes for the weekday AM, weekday PM, and Saturday midday peak hours. **Table 17** presents the overall intersection operational results including intersection v/c, intersection Auto LOS, individual movement v/c, and movement 95th percentile queue for each study intersection under year 2027 total conditions during the weekday AM, weekday PM, and Saturday midday peak hours. **Appendix H** includes the year 2027 total conditions Synchro worksheets.

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- Study Intersection
- Study Site Access

Year 2027 Total Vehicle Traffic Volumes
Weekday AM, Weekday PM, Saturday Midday Peak Hours
Ottawa, Ontario

Figure
14

Table 17. Year 2027 Total Intersection & Movement Operations Summary

Intersection	Traffic Control	Overall Intersection (AM / PM / SAT)		Movement Summary (AM / PM / SAT)		
		v/c ¹	Auto LOS ²	Movement	v/c	95 th Percentile Queue (m)
1. Highway 417 SB Ramp / Innes Road	Traffic Signal	0.73 / 0.75 / 0.58	C / C / A	EBT	0.30 / 0.67 / 0.45	40.1 / 155.2 / 63.8
				WBT	0.71 / 0.41 / 0.45	89.8 / 33.1 / 64.6
				SBL	0.90 / 0.93 / 0.89	89.1 / 160.0 / 98.2
2. Highway 417 NB Ramp / Innes Road	Traffic Signal	0.75 / 0.70 / 0.63	C / C / B	EBT	0.37 / 0.69 / 0.54	32.5 / 150.1 / 71.1
				WBT	0.74 / 0.43 / 0.48	12.2 / 4.2 / 5.5
				NBL	0.87 / 0.75 / 0.67	82.7 / 33.9 / 26.0
3. Innes Crossing / Innes Road	Traffic Signal	0.83 / 0.74 / 0.77	D / C / C	EBL	1.62 / 0.85 / 1.22	114.5 / 63.4 / 102.7
				EBTR	0.45 / 0.89 / 0.81	91.5 / 287.5 / 170.5
				WBL	0.70 / 0.66 / 0.61	8.0 / 7.6 / 4.7
				WBT	1.02 / 0.73 / 1.16	46.2 / 58.7 / 42.6
				WBR	0.05 / 0.09 / 0.24	0.1 / 2.4 / 1.8
				NBLTR	0.23 / 0.21 / 0.14	36.5 / 30.8 / 16.9
				SBL	0.10 / 0.21 / 0.20	19.6 / 33.8 / 30.8
				SBT	0.01 / 0.03 / 0.02	3.7 / 8.4 / 5.1
				SBR	0.30 / 0.41 / 0.46	20.9 / 17.4 / 16.4
4. Cyrville Road / Innes Road	Traffic Signal	0.85 / 0.91 / 0.84	D / E / D	EBL	1.02 / 0.81 / 0.79	82.5 / 26.9 / 29.8
				EBT	0.43 / 1.17 / 1.10	25.0 / 275.2 / 136.4
				WBL	0.83 / 1.08 / 1.07	39.2 / 90.1 / 102.5
				WBT	1.02 / 0.66 / 1.08	328.8 / 124.3 / 176.5
				NBL	1.73 / 0.92 / 1.65	100.9 / 83.6 / 116.1
				NBT	0.20 / 0.14 / 0.17	34.7 / 26.2 / 27.5
				NBR	0.26 / 0.46 / 0.49	6.7 / 23.8 / 16.9
				SBL	0.69 / 1.31 / 0.73	33.0 / 133.7 / 40.4
				SBT	0.10 / 0.29 / 0.15	20.1 / 48.0 / 24.7

Intersection	Traffic Control	Overall Intersection (AM / PM / SAT)		Movement Summary (AM / PM / SAT)		
		v/c ¹	Auto LOS ²	Movement	v/c	95 th Percentile Queue (m)
5. Stonehenge Crescent / Innes Road	Traffic Signal	0.75 / 0.72 / 0.55	C / C / A	EBL	0.63 / 0.79 / 0.78	12.7 / 16.0 / 15.1
				EBTR	0.32 / 0.78 / 0.50	13.0 / 54.6 / 23.4
				WBL	0.80 / 0.79 / 0.78	35.4 / 30.0 / 26.9
				WBTR	0.79 / 0.46 / 0.58	228.9 / 86.9 / 111.2
				NBLTR	0.20 / 0.43 / 0.40	14.2 / 26.0 / 21.9
				SBL	0.09 / 0.10 / 0.11	12.1 / 13.5 / 13.1
				SBTR	0.54 / 0.32 / 0.37	18.7 / 15.2 / 13.4
6. Costco Business Centre N Driveway / Cyrville Road	TWSC	0.16 / 0.21 / 0.29	A / A / A	WBR	0.16 / 0.1 / 0.17	7.6 / 7.6 / 7.6
				SBTR	0.04 / 0.05 / 0.02	7.6 / 7.6 / 7.6
7. Costco Business Centre New Driveway / Cyrville Road	TWSC	0.12 / 0.30 / 0.52	A / A / A	EBLR	0.12 / 0.30 / 0.52	7.6 / 9.1 / 19.8
				NBTL	0.00 / 0.00 / 0.00	0.0 / 0.0 / 0.0
8. Costco Business Centre Central Driveway / Cyrville Road	TWSC	0.25 / 0.52 / 0.76	A / A / A	EBLR	0.25 / 0.52 / 0.76	7.6 / 23.6 / 55.6
				NBTL	0.00 / 0.00 / 0.00	0.0 / 0.0 / 0.0

¹ Overall intersection v/c ratio for traffic signal reported from HCM 2000 Synchro Report. Overall intersection v/c ratio for unsignalized control reported from critical movement HCM 6th Edition Synchro Report. ² Auto LOS calculated according to City of Ottawa MMLOS Guidelines.

As demonstrated in Table 17, all study intersections are forecast to continue to operate within the identified Outer Urban Auto LOS threshold of LOS E or better under year 2027 total conditions. While all intersections operate LOS E or better and under capacity, there are some movements projected to continue to operate over capacity (v/c > 1.00) at the following locations:

- **Innes Crossing / Innes Road:** During the weekday AM and Saturday midday peak hours the eastbound left-turn and westbound through movements operate over capacity.
- **Cyrville Road / Innes Road:** During the weekday AM peak hour, the westbound through, eastbound left-turn, and northbound left-turn movements operate over capacity. During the weekday PM peak hour, the eastbound through, westbound left-turn, and southbound left-turn movements operate over capacity. During the Saturday midday peak hour, the eastbound through, westbound left-turn, westbound through, and northbound left-turn movements operate over capacity.

Similar to year 2025 existing conditions, while these identified movements are projected to operate over capacity, the overall intersection operations meet City of Ottawa Auto LOS thresholds. Movement operations and queuing may be further improved with traffic signal timing adjustments to provide additional green time to the minor street approaches while still maintaining coordinated signal timing along the Innes Road corridor.

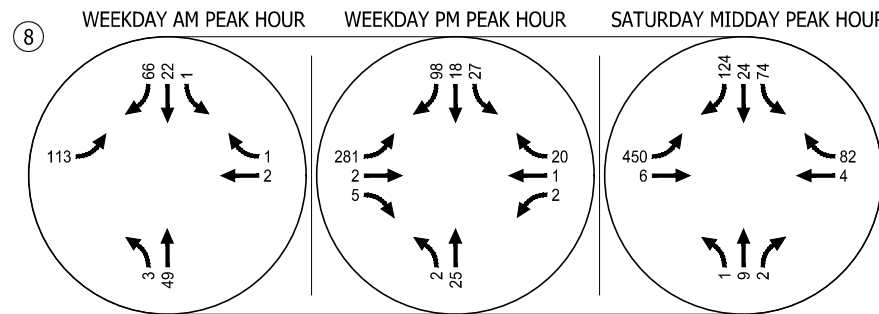
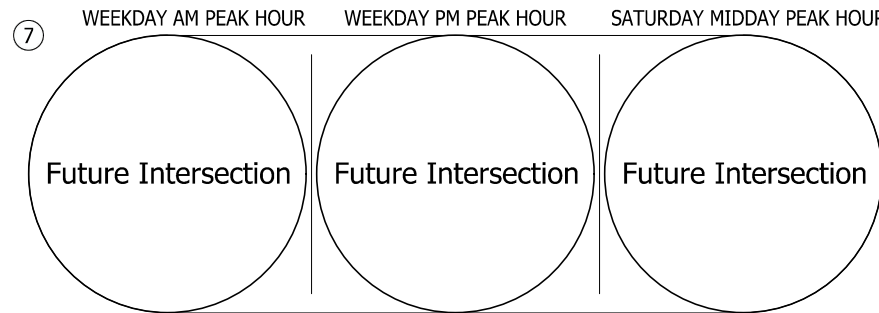
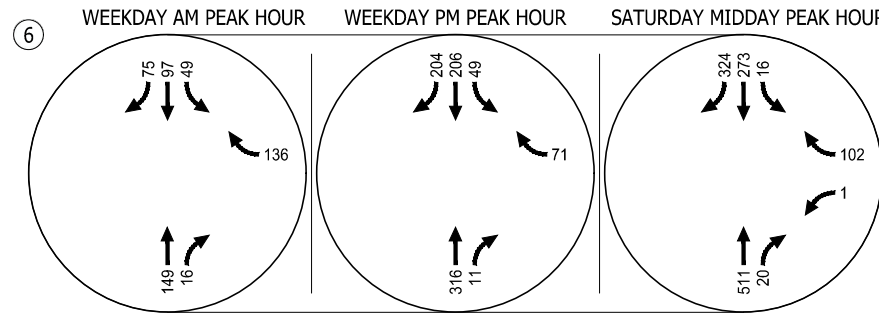
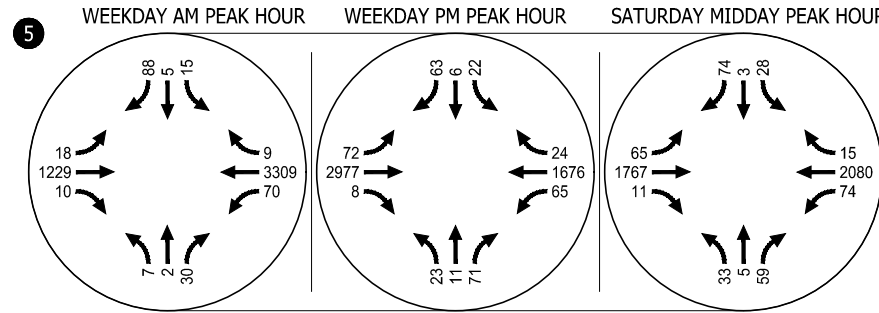
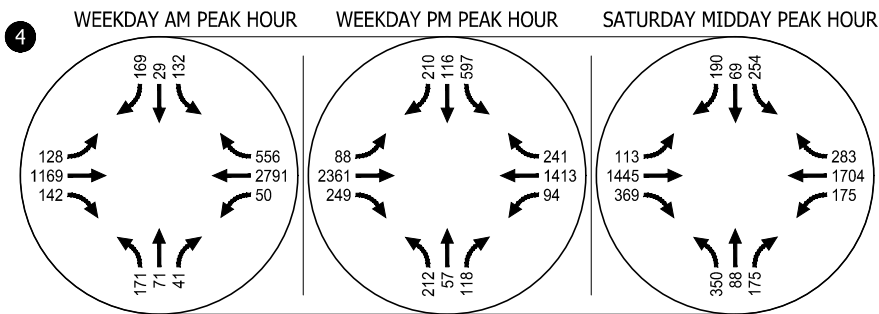
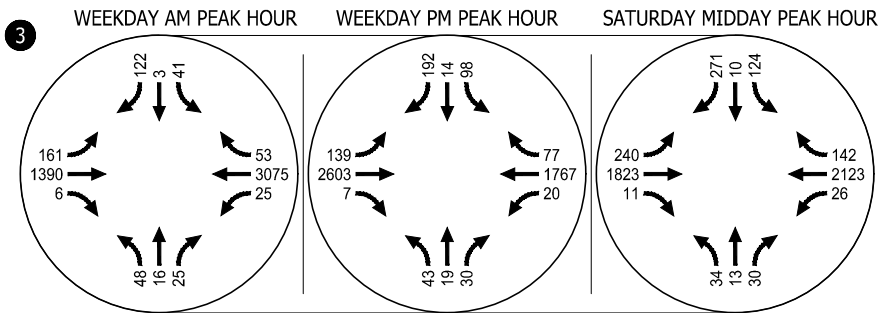
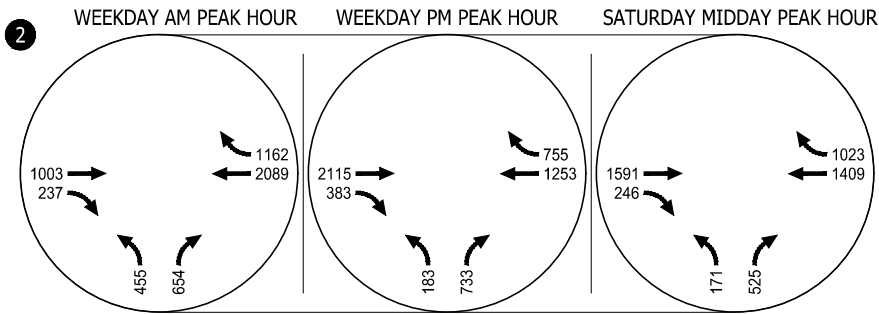
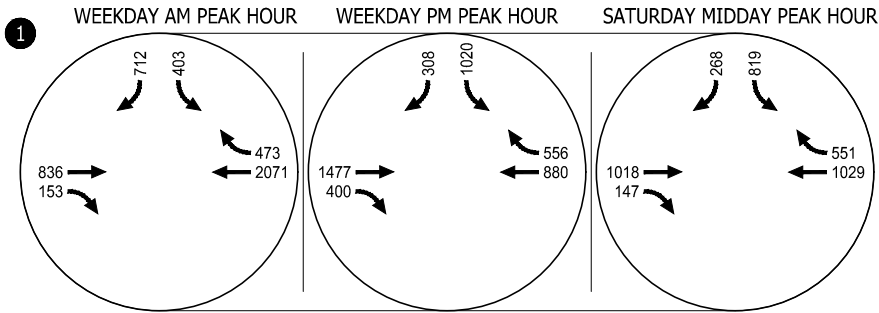
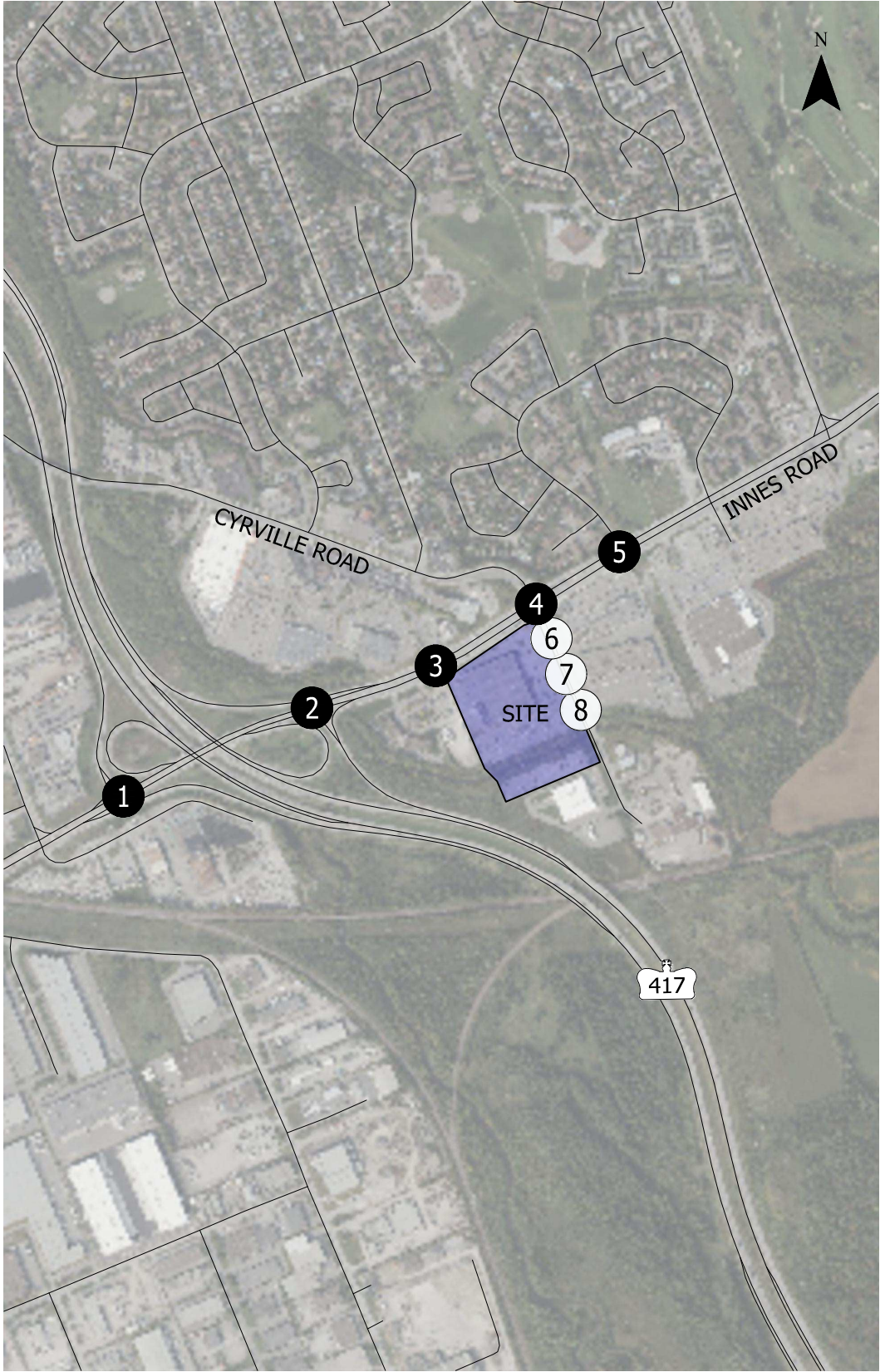
An evaluation of forecast queue lengths under year 2027 build-out conditions as shown in Table 17 indicates minimal risk of internal queues spilling back onto Cyrville Road at any of the Costco access driveways. While outbound queues may infrequently extend to the full 95th percentile length projected, the duration and frequency of such conditions is limited and unlikely to be sustained for extended periods. Because there are two (2) site access options to exit the main site parking field, Costco members will tend to naturally distribute more evenly between them depending on time of day and traffic conditions on Cyrville Road. Forecast 95th percentile queues represent conditions that are likely to exist only five (5) percent of the time. The reported average queues are a better indicator of regular conditions and are all forecast to be contained within available storages/driveway throat lengths. Such conditions will have no meaningful impact on site circulation.

Year 2032 Background Conditions

As there are no significant proposed geometric changes to the existing pedestrian and bicycle infrastructure in the site vicinity in year 2032, the multi-modal level of service (LOS) remains the same as under year 2025 Existing Conditions, outlined in Table 14.

Figure 15 summarizes the year 2032 background condition traffic volumes for the weekday AM, weekday PM, and Saturday midday peak hours. **Table 18** presents the overall intersection operational results including intersection v/c, intersection Auto LOS, individual movement v/c, and movement 95th percentile queue for each study intersection under year 2032 background conditions during the weekday AM, weekday PM, and Saturday midday peak hours. **Appendix I** includes the year 2032 background conditions *Synchro* worksheets.

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- Study Intersection
- Study Site Access

Year 2032 Background Vehicle Traffic Volumes
Weekday AM, Weekday PM, Saturday MIDDAY Peak Hours
Ottawa, Ontario

Figure
15

Table 18. Year 2032 Background Intersection & Movement Operations Summary

Intersection	Traffic Control	Overall Intersection (AM / PM / SAT)		Movement Summary (AM / PM / SAT)		
		v/c ¹	Auto LOS ²	Movement	v/c	95 th Percentile Queue (m)
1. Highway 417 SB Ramp / Innes Road	Traffic Signal	0.79 / 0.81 / 0.62	C / D / B	EBT	0.33 / 0.74 / 0.49	45.2 / 180.7 / 71.5
				WBT	0.78 / 0.46 / 0.50	119.1 / 42.5 / 72.4
				SBL	0.90 / 0.94 / 0.90	87.7 / 176.2 / 105.8
2. Highway 417 NB Ramp / Innes Road	Traffic Signal	0.82 / 0.74 / 0.64	D / C / B	EBT	0.39 / 0.74 / 0.57	35.2 / 154.4 / 80.6
				WBT	0.81 / 0.45 / 0.50	12.8 / 4.9 / 6.8
				NBL	0.89 / 0.76 / 0.69	91.7 / 36.8 / 28.1
3. Innes Crossing / Innes Road	Traffic Signal	0.89 / 0.78 / 0.81	D / C / D	EBL	1.79 / 0.92 / 1.35	126.6 / 67.5 / 114.8
				EBTR	0.47 / 0.93 / 0.82	96.1 / 309.3 / 176.5
				WBL	0.70 / 0.66 / 0.61	7.8 / 8.1 / 5.3
				WBT	1.09 / 0.75 / 1.20	33.2 / 42.5 / 33.5
				WBR	0.06 / 0.10 / 0.26	0.0 / 0.8 / 0.9
				NBLTR	0.23 / 0.21 / 0.15	36.5 / 30.8 / 16.9
				SBL	0.11 / 0.23 / 0.22	21.3 / 37.4 / 33.7
				SBT	0.01 / 0.03 / 0.02	3.7 / 8.4 / 5.1
				SBR	0.33 / 0.45 / 0.50	25.3 / 22.9 / 21.4
4. Cyrville Road / Innes Road	Traffic Signal	0.89 / 0.95 / 0.78	D / E / C	EBL	1.13 / 0.82 / 0.80	91.9 / 28.4 / 32.2
				EBT	0.46 / 1.28 / 1.21	28.5 / 327.5 / 164.4
				WBL	0.79 / 0.81 / 0.87	18.3 / 53.9 / 75.0
				WBT	1.13 / 0.76 / 1.25	394.9 / 146.0 / 209.3
				NBL	1.02 / 0.51 / 1.11	55.0 / 41.8 / 72.5
				NBT	0.19 / 0.13 / 0.16	33.5 / 24.2 / 25.5
				NBR	0.13 / 0.32 / 0.38	0.0 / 13.9 / 14.8
				SBL	0.77 / 1.46 / 0.81	38.9 / 152.3 / 47.7
				SBT	0.08 / 0.26 / 0.12	16.8 / 43.4 / 21.0

Intersection	Traffic Control	Overall Intersection (AM / PM / SAT)		Movement Summary (AM / PM / SAT)		
		v/c ¹	Auto LOS ²	Movement	v/c	95 th Percentile Queue (m)
5. Stonehenge Crescent / Innes Road	Traffic Signal	0.82 / 0.79 / 0.60	D / C / A	EBL	0.64 / 0.80 / 0.79	12.5 / 15.1 / 14.2
				EBTR	0.35 / 0.87 / 0.55	12.1 / 51.7 / 23.5
				WBL	0.80 / 0.79 / 0.79	38.1 / 32.2 / 29.0
				WBTR	0.88 / 0.51 / 0.65	303.1 / 101.8 / 132.4
				NBLTR	0.23 / 0.45 / 0.43	15.2 / 27.4 / 23.4
				SBL	0.09 / 0.11 / 0.13	12.6 / 14.6 / 14.1
				SBTR	0.57 / 0.34 / 0.38	19.6 / 15.9 / 14.0
6. Costco Business Centre N Driveway / Cyrville Road	TWSC	0.14 / 0.12 / 0.20	A / A / A	WBR	0.14 / 0.08 / 0.14	7.6 / 7.6 / 7.6
				SBTR	0.04 / 0.04 / 0.02	7.6 / 7.6 / 7.6
7. Costco Business Centre New Driveway / Cyrville Road	TWSC	Intersection Not Applicable Under This Scenario				
8. Costco Business Centre Central Driveway / Cyrville Road	TWSC	0.13 / 0.31 / 0.50	A / A / A	EBLR	0.13 / 0.32 / 0.50	7.6 / 22.9 / 30.5
				NBTL	0.00 / 0.00 / 0.00	0.0 / 0.0 / 0.0

¹ Overall intersection v/c ratio for traffic signal reported from HCM 2000 Synchro Report. Overall intersection v/c ratio for unsignalized control reported from critical movement HCM 6th Edition Synchro Report. ² Auto LOS calculated according to City of Ottawa MMLOS Guidelines.

As demonstrated in Table 18, all study intersections are forecast to continue to operate within the identified Outer Urban Auto LOS threshold of LOS E or better under year 2027 total conditions. While all intersections operate LOS E or better and under capacity, there are some movements projected to operate over capacity (v/c > 1.00) at the following locations:

- **Innes Crossing / Innes Road:** During the weekday AM and Saturday midday peak hours the eastbound left-turn and westbound through movements operate over capacity.
- **Cyrville Road / Innes Road:** During the weekday AM peak hour, the westbound through, eastbound left-turn, and northbound left-turn movements operate over capacity. During the weekday PM peak hour, the eastbound through and southbound left-turn movements operate over capacity. During the Saturday midday peak hour, the eastbound through, westbound through, and northbound left-turn movements operate over capacity.

Similar to year 2025 existing conditions, while these identified movements are projected to continue to operate over capacity, the overall intersection operations meet City of Ottawa Auto LOS thresholds.

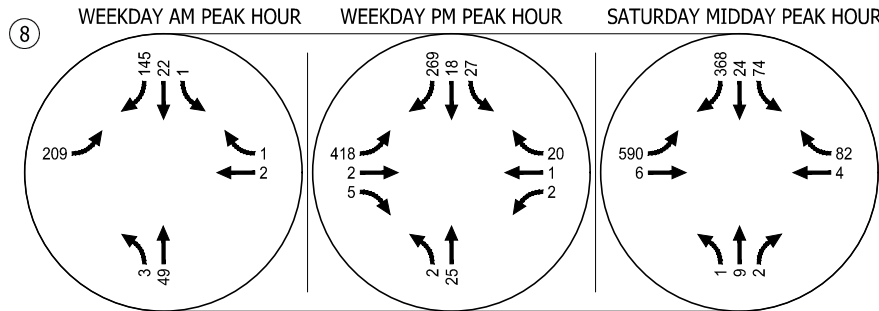
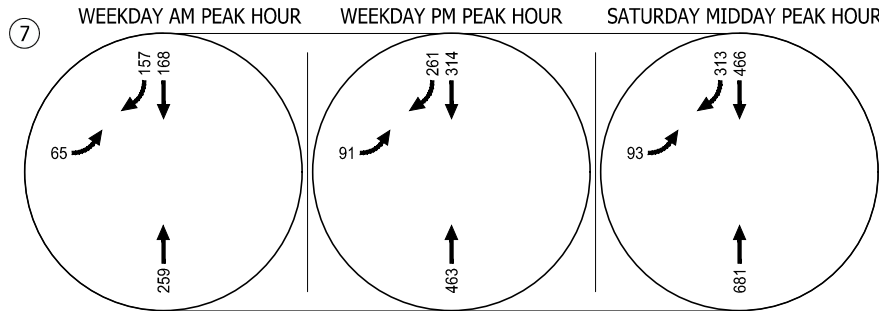
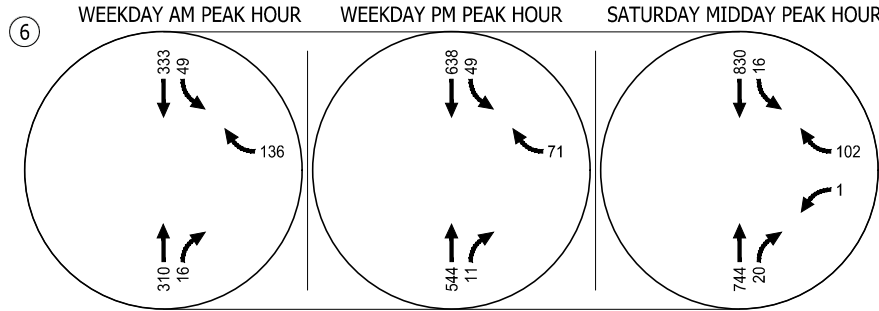
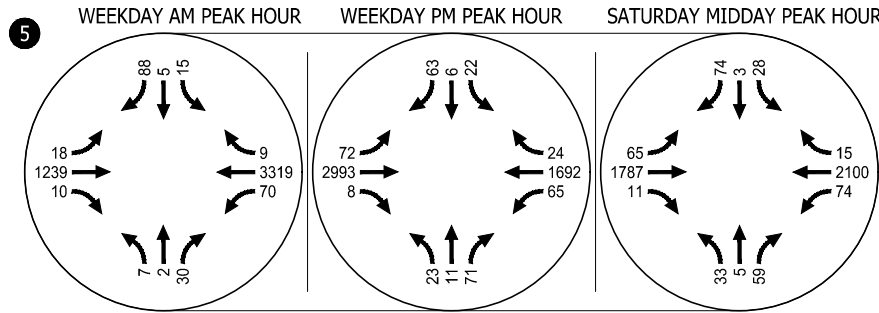
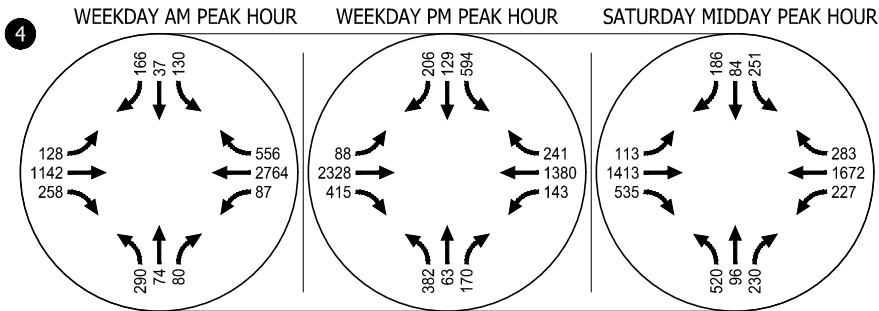
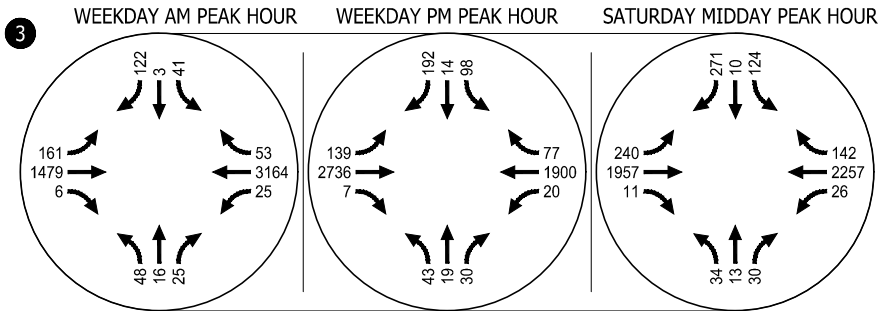
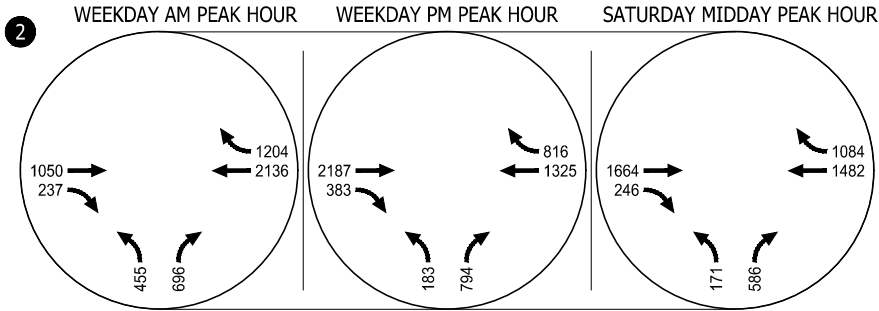
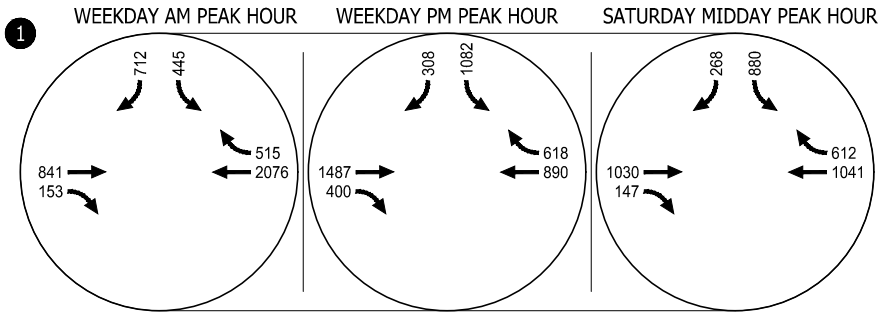
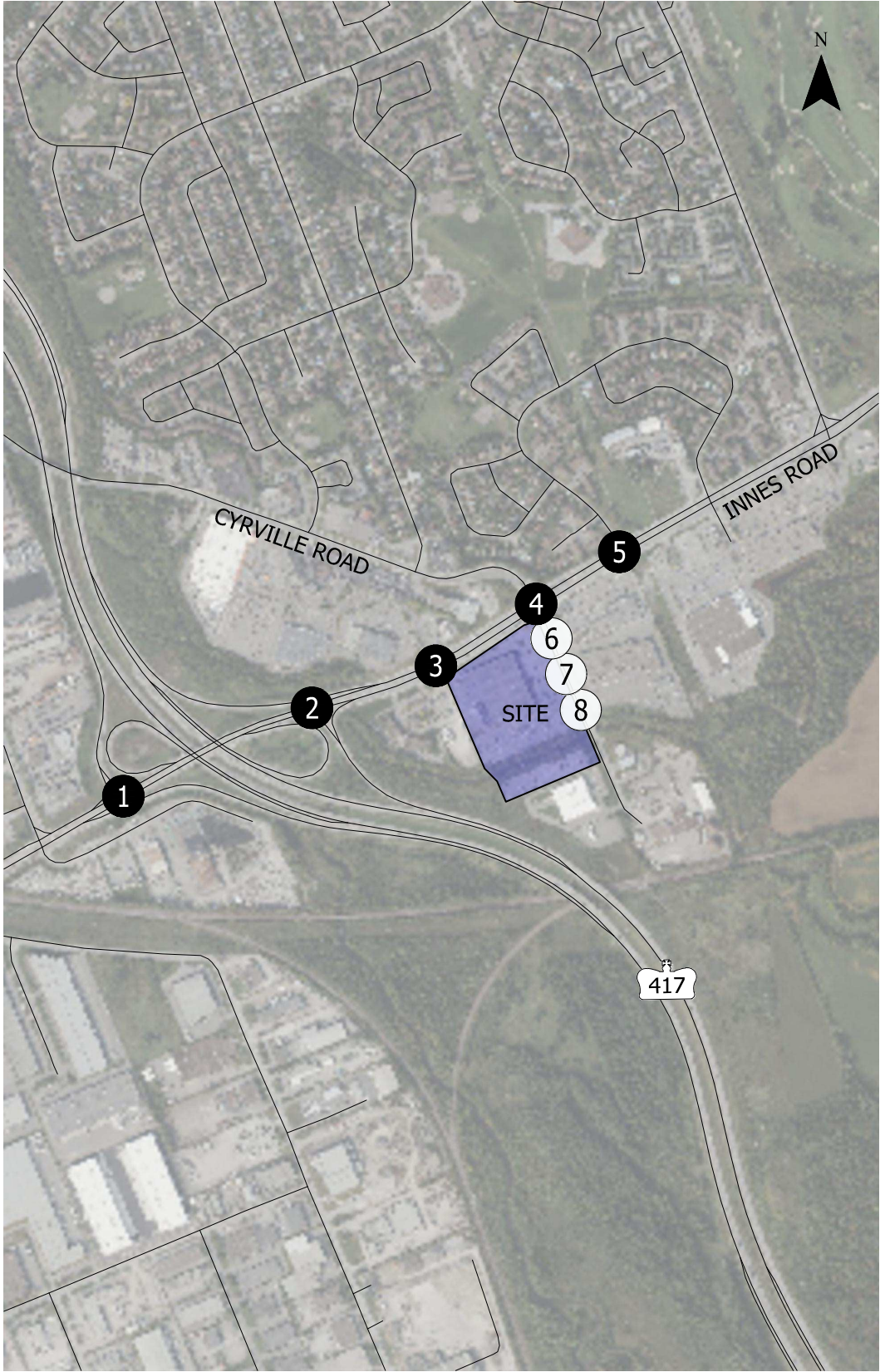
Movement operations and queuing may be further improved with traffic signal timing adjustments to provide additional green time to the minor street approaches while still maintaining coordinated signal timing along the Innes Road corridor.

Year 2032 Total Conditions

As there are no significant proposed geometric changes to the existing pedestrian and bicycle infrastructure in the site vicinity in year 2032, the multi-modal level of service (LOS) remains the same as under year 2025 Existing Conditions, outlined in Table 14.

Figure 16 summarizes the year 2032 total condition traffic volumes for the weekday AM, weekday PM, and Saturday midday peak hours. **Table 19** presents the overall intersection operational results including intersection v/c, intersection Auto LOS, individual movement v/c, and movement 95th percentile queue for each study intersection under year 2032 total conditions during the weekday AM, weekday PM, and Saturday midday peak hours. **Appendix J** includes the year 2032 total conditions Synchro worksheets.

C:\Users\hoffman\appdata\local\temp\AcPublish_21640\31847_gloucester costco gas addition_TIS figs.dwg Sep 29, 2025 - 1:59pm - hoffman Layout Tab: fig 16, 2032 total volumes



- Study Intersection
- Study Site Access

Year 2032 Total Vehicle Traffic Volumes
Weekday AM, Weekday PM, Saturday Midday Peak Hours
Ottawa, Ontario

Figure
16

Table 19. Year 2032 Total Intersection & Movement Operations Summary

Intersection	Traffic Control	Overall Intersection (AM / PM / SAT)		Movement Summary (AM / PM / SAT)		
		v/c ¹	Auto LOS ²	Movement	v/c	95 th Percentile Queue (m)
1. Highway 417 SB Ramp / Innes Road	Traffic Signal	0.80 / 0.83 / 0.64	C / D / B	EBT	0.33 / 0.76 / 0.51	45.3 / 182.7 / 72.6
				WBT	0.79 / 0.47 / 0.51	137.3 / 44.9 / 73.7
				SBL	0.92 / 0.97 / 0.93	103.0 / 194.8 / 119.4
2. Highway 417 NB Ramp / Innes Road	Traffic Signal	0.83 / 0.77 / 0.69	D / C / B	EBT	0.41 / 0.77 / 0.60	35.4 / 162.8 / 87.7
				WBT	0.83 / 0.47 / 0.53	12.4 / 4.8 / 6.4
				NBL	0.89 / 0.76 / 0.69	91.7 / 36.8 / 28.1
3. Innes Crossing / Innes Road	Traffic Signal	0.91 / 0.81 / 0.85	E / D / D	EBL	1.79 / 0.92 / 1.35	126.5 / 65.3 / 114.9
				EBTR	0.50 / 0.97 / 0.88	107.3 / 337.4 / 199.0
				WBL	0.70 / 0.66 / 0.61	7.4 / 7.1 / 4.5
				WBT	1.12 / 0.80 / 1.28	44.9 / 62.0 / 42.0
				WBR	0.06 / 0.10 / 0.26	0.3 / 2.0 / 1.6
				NBLTR	0.23 / 0.21 / 0.15	36.5 / 30.8 / 16.9
				SBL	0.11 / 0.23 / 0.22	21.3 / 37.4 / 33.7
				SBT	0.01 / 0.03 / 0.02	3.7 / 8.4 / 5.1
				SBR	0.33 / 0.45 / 0.50	25.3 / 23.3 / 21.4
4. Cyrville Road / Innes Road	Traffic Signal	0.93 / 0.99 / 0.88	E / E / D	EBL	1.13 / 0.82 / 0.80	92.6 / 27.2 / 30.2
				EBT	0.47 / 1.29 / 1.22	27.3 / 298.2 / 157.2
				WBL	0.83 / 1.08 / 1.07	33.3 / 90.1 / 104.2
				WBT	1.12 / 0.74 / 1.22	388.5 / 141.4 / 204.1
				NBL	1.73 / 0.92 / 1.65	100.9 / 83.6 / 116.1
				NBT	0.20 / 0.14 / 0.17	34.7 / 26.2 / 27.5
				NBR	0.26 / 0.46 / 0.49	6.7 / 23.8 / 16.9
				SBL	0.76 / 1.45 / 0.80	37.8 / 151.1 / 46.8
				SBT	0.10 / 0.29 / 0.15	20.1 / 48.0 / 24.7

Intersection	Traffic Control	Overall Intersection (AM / PM / SAT)		Movement Summary (AM / PM / SAT)		
		v/c ¹	Auto LOS ²	Movement	v/c	95 th Percentile Queue (m)
5. Stonehenge Crescent / Innes Road	Traffic Signal	0.82 / 0.79 / 0.61	D / C / B	EBL	0.64 / 0.80 / 0.79	12.5 / 15.5 / 14.5
				EBTR	0.35 / 0.88 / 0.56	14.6 / 54.5 / 26.8
				WBL	0.80 / 0.79 / 0.79	38.1 / 32.2 / 29.0
				WBTR	0.88 / 0.51 / 0.65	305.8 / 103.1 / 134.4
				NBLTR	0.23 / 0.45 / 0.43	15.2 / 27.4 / 23.4
				SBL	0.09 / 0.11 / 0.13	12.6 / 14.6 / 14.1
				SBTR	0.57 / 0.34 / 0.38	19.6 / 15.9 / 14.0
6. Costco Business Centre N Driveway / Cyrville Road	TWSC	0.16 / 0.21 / 0.29	A / A / A	WBR	0.16 / 0.10 / 0.17	7.6 / 7.6 / 7.6
				SBTR	0.04 / 0.05 / 0.02	7.6 / 7.6 / 7.6
7. Costco Business Centre New Driveway / Cyrville Road	TWSC	0.12 / 0.30 / 0.52	A / A / A	EBLR	0.12 / 0.30 / 0.52	7.6 / 9.1 / 19.8
				NBTL	0.00 / 0.00 / 0.00	0.0 / 0.0 / 0.0
8. Costco Business Centre Central Driveway / Cyrville Road	TWSC	0.25 / 0.52 / 0.76	A / A / A	EBLR	0.25 / 0.52 / 0.76	7.6 / 23.6 / 55.6
				NBTL	0.00 / 0.00 / 0.00	0.0 / 0.0 / 0.0

¹ Overall intersection v/c ratio for traffic signal reported from HCM 2000 Synchro Report. Overall intersection v/c ratio for unsignalized control reported from critical movement HCM 6th Edition Synchro Report. ² Auto LOS calculated according to City of Ottawa MMLOS Guidelines.

As demonstrated in Table 19, all study intersections are forecast to continue to operate within the identified Outer Urban Auto LOS threshold of LOS E or better under year 2032 total conditions. While all intersections operate LOS E or better and under capacity, there are some movements projected to operate over capacity (v/c > 1.00) at the following locations:

- **Innes Crossing / Innes Road:** During the weekday AM and Saturday midday peak hours the eastbound left-turn and westbound through movements operate over capacity.
- **Cyrville Road / Innes Road:** During the weekday AM peak hour, the westbound through, eastbound left-turn, and northbound left-turn movements operate over capacity. During the weekday PM peak hour, the eastbound through, westbound left-turn, and southbound left-turn movements operate over capacity. During the Saturday midday peak hour, the eastbound through, westbound left-turn, westbound through, and northbound left-turn movements operate over capacity.

Similar to year 2025 existing conditions, while these identified movements are forecast to continue to operate over capacity, the overall intersection operations meet City of Ottawa Auto LOS thresholds. Movement operations and queuing may be further improved with traffic signal timing adjustments to provide additional green time to the minor street approaches while still maintaining coordinated signal timing along the Innes Road corridor.



Section 4

Findings & Recommendations

FINDINGS & RECOMMENDATIONS

Kittelson Canada, LLC has prepared a Traffic Impact Assessment (TIA) for the Gloucester Costco Business Centre Gas Bar Addition in Gloucester, Ontario. The gas bar will be located in the northeast corner of the existing Gloucester Costco Business Centre, in the southwest corner of the Cyrville Road / Innes Road intersection. The gas bar will consist of 24 fueling positions. The TIA resulted in the following findings and recommendations.

Findings

FORECASTING

- The Gloucester Costco Business Centre gas bar is estimated to generate approximately 76 net new weekday AM peak hour trips (38 inbound / 38 outbound), approximately 128 net new weekday PM peak hour trips (64 inbound / 64 outbound), and 160 net new Saturday midday peak hour trips (80 inbound / 80 outbound). Additionally, the Gloucester Costco Business Centre fuel facility is estimated to generate approximately 1,326 net new weekday daily trips and 1,274 net new Saturday daily trips.
- 95th percentile gas bar queues are anticipated to be contained within designated queuing area during all peak periods.

DEVELOPMENT DESIGN AND PARKING

- The existing Costco Business Centre is currently served by three accesses along Cyrville Road – one (1) right-in only access, two (2) full movement accesses.
- The Project proposes to close the existing right-in access closest to Cyrville Road and construct one (1) new full movement access to be located approximately 140 metres south of Innes Road and 50 metres north of the existing middle driveway.
- With the addition of the fuel facility, the total number of available parking stalls will be reduced by 125 stalls from 603 to a new total of 478 stalls. The number of stalls required by the City's minimum By-Law (3.4 stalls per 100 square metres) is a total of 400 stalls, and based on this minimum requirement, the Project's proposed number of parking stalls with the addition of the gas bar still exceeds the minimum number of stalls required.
- Under existing and proposed conditions, the overall site operates and is forecast to operate within the recommended parking supply during weekday and Saturday.
- Costco fuel trucks will enter the site via the new northern-most driveway to the site to a designated external drop area (outside of the gas bar queuing area), then continue around the warehouse to exit the site at the existing middle driveway.

BOUNDARY STREETS

- The boundary street for this project, as well as for the existing Gloucester Costco Business Centre site, is Cyrville Road. At this time, there is no complete street concept for Cyrville Road south of Innes Road.

- As part of the gas bar addition Project, Costco is planning to construct improved sidewalk facilities along the site frontage from Innes Road to the middle driveway. The installation of the sidewalk construction and extension is consistent with the Complete Streets Program with the intent to enable safe, comfortable, and barrier-free access for all users. The site plan retains a designated direct pedestrian pathway through the site to the entrance of the Business Centre.

ACCESS DESIGN

- With the Project in place the site will continue to be served by three (3) driveways:
 - New northern full movement driveway approximately 140 metres south of Innes Road (existing right-in only driveway 55 metres south of Innes Road removed)
 - Existing central full movement driveway
 - Existing southern full movement driveway

Recommendations

- Extend sidewalk southward as shown on the site plan to central driveway and retain designated pedestrian path from Cyrville Road to the Business Centre entrance.

Appendix A

TIA Screening Form

City of Ottawa 2017 Transportation Impact Assessment (TIA) Guidelines Screening Form

1. Description of Proposed Development

Municipal Address	1900 Cyrville Road
Description of Location	Costco Business Center Gas Bar Addition
Land Use Classification	General Mixed Use
Development Size (units)	24 Fueling Positions
Development Size (m ²)	815
Number of Accesses and Locations	1 existing/relocated to Cyrville Road, 1 existing to Cyrville Road
Phase of Development	1
Buildout Year	2027

If available, please attach a sketch of the development or site plan to this form.

2. Trip Generation Trigger

Considering the Development's Land Use type and Size (as filled out in the previous section), please refer to the Trip Generation Trigger checks below.

Table notes:

1. Table 2, Table 3 & Table 4 TRANS Trip Generation Manual
2. Institute of Transportation Engineers (ITE) Trip Generation Manual 11.1 Ed.

Land Use Type	Minimum Development Size
Single-family homes	60 units
Multi-Use Family (Low-Rise) ¹	90 units
Multi-Use Family (High-Rise) ¹	150 units
Office ²	1,400 m ²
Industrial ²	7,000 m ²
Fast-food restaurant or coffee shop ²	110 m ²
Destination retail ²	1,800 m ²
Gas station or convenience market ²	90 m ²

If the proposed development size is greater than the sizes identified above, the Trip Generation Trigger is satisfied.

¹ Hubs are identified in Schedules B1 to B8 of the City of Ottawa Official Plan. PMTSAs are identified in Schedule C1 of the Official Plan. DPAs are identified in Schedule C7A and C7B of the Official Plan. See Chapter 4 for a list of City of Ottawa Planning and Engineering documents that support the completion of TIA.

3. Location Triggers

	Yes	No
Does the development propose a new driveway to a boundary street that is designated as part of the City's Transit Priority Network, Rapid Transit network or Cross-Town Bikeways?		X
Is the development in a Hub, a Protected Major Transit Station Area (PMTSA), or a Design Priority Area (DPA)? ¹		X

If any of the above questions were answered with 'Yes,' the Location Trigger is satisfied.

4. Safety Triggers

	Yes	No
Are posted speed limits on a boundary street 80 km/hr or greater?		X
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?		X
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions)?	X	
Is the proposed driveway within auxiliary lanes of an intersection?		X
Does the proposed driveway make use of an existing median break that serves an existing site?		X
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?		X
Does the development include a drive-thru facility?	X	

If any of the above questions were answered with 'Yes,' the Safety Trigger is satisfied.

5. Summary

	Yes	No
Does the development satisfy the Trip Generation Trigger?	X	
Does the development satisfy the Location Trigger?		X
Does the development satisfy the Safety Trigger?	X	

If none of the triggers are satisfied, the TIA Study is complete. If one or more of the triggers is satisfied, the TIA Study must continue into the next stage (Screening and Scoping).

Appendix B

Existing Traffic Count Data

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period

From: 7:00:00

To: 9:00:00

One Hour Peak

From: 7:30:00

To: 8:30:00

Municipality: Ottawa

Site #: 2509300005

Intersection: Innes Rd & HWY 417 SB Ramp

TFR File #: 1

Count date: 12-Jun-25

Weather conditions:

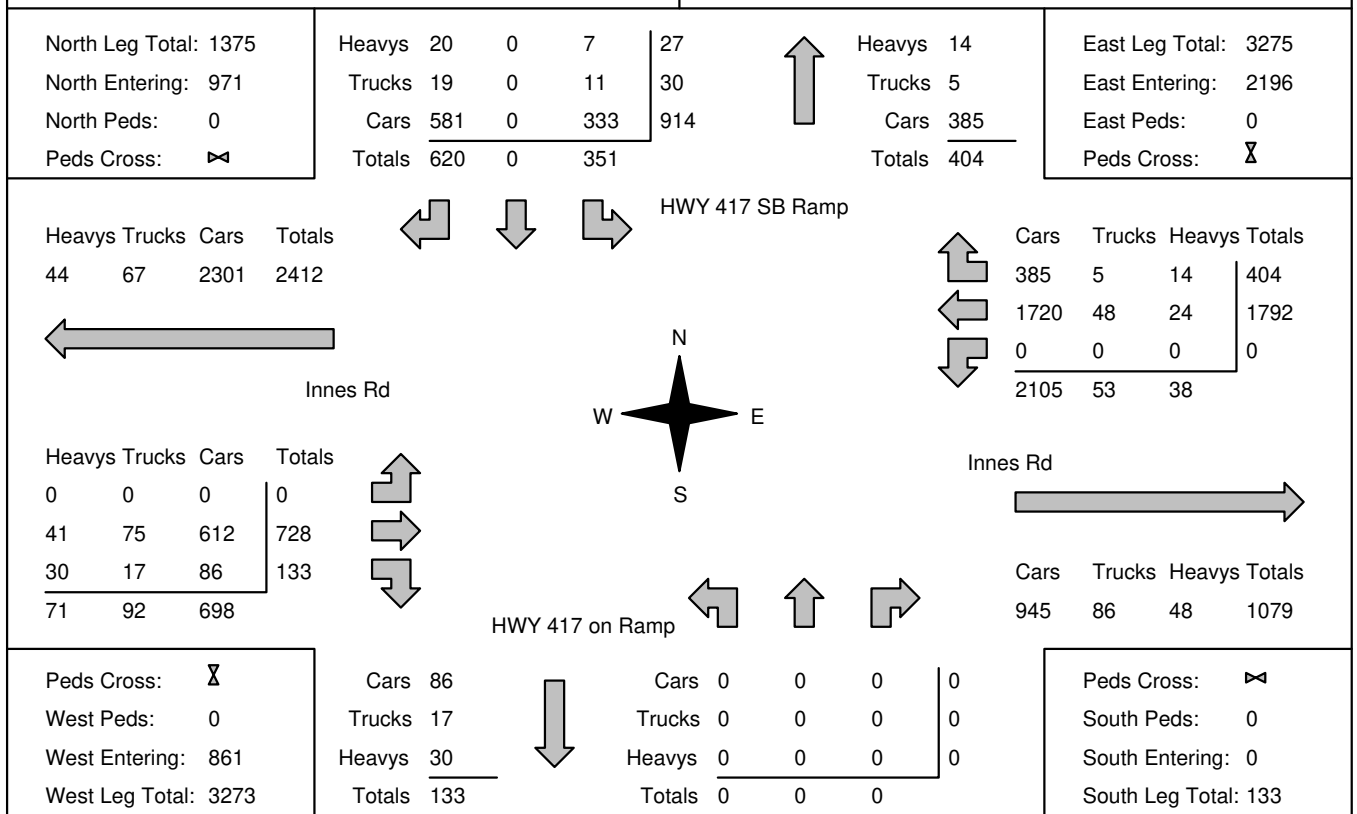
Person counted:

Person prepared:

Person checked:

** Signalized Intersection **

Major Road: Innes Rd runs W/E



Comments

Accu-Traffic Inc.

Afternoon Peak Diagram	Specified Period From: 16:00:00 To: 18:00:00	One Hour Peak From: 16:00:00 To: 17:00:00
Municipality: Ottawa Site #: 2509300005 Intersection: Innes Rd & HWY 417 SB Ramp TFR File #: 1 Count date: 12-Jun-25	Weather conditions: Person counted: Person prepared: Person checked:	
** Signalized Intersection **		Major Road: Innes Rd runs W/E

North Leg Total: 1651 North Entering: 1176 North Peds: 0 Peds Cross:	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Heavys</td><td>31</td><td>0</td><td>4</td><td>35</td></tr> <tr><td>Trucks</td><td>25</td><td>0</td><td>14</td><td>39</td></tr> <tr><td>Cars</td><td>203</td><td>0</td><td>899</td><td>1102</td></tr> <tr><td>Totals</td><td>259</td><td>0</td><td>917</td><td></td></tr> </table>	Heavys	31	0	4	35	Trucks	25	0	14	39	Cars	203	0	899	1102	Totals	259	0	917		<table style="width: 100%; border-collapse: collapse;"> <tr><td>Heavys</td><td>15</td></tr> <tr><td>Trucks</td><td>18</td></tr> <tr><td>Cars</td><td>442</td></tr> <tr><td>Totals</td><td>475</td></tr> </table>	Heavys	15	Trucks	18	Cars	442	Totals	475	East Leg Total: 3470 East Entering: 1255 East Peds: 0 Peds Cross:
Heavys	31	0	4	35																											
Trucks	25	0	14	39																											
Cars	203	0	899	1102																											
Totals	259	0	917																												
Heavys	15																														
Trucks	18																														
Cars	442																														
Totals	475																														

Heavys	Trucks	Cars	Totals
76	49	914	1039

HWY 417 SB Ramp

Innes Rd

Cars	Trucks	Heavys	Totals
442	18	15	475
711	24	45	780
0	0	0	0
1153	42	60	

Heavys	Trucks	Cars	Totals
0	0	0	0
8	8	1282	1298
15	7	355	377
23	15	1637	

HWY 417 on Ramp

Innes Rd

Cars	Trucks	Heavys	Totals
2181	22	12	2215

Peds Cross: West Peds: 0 West Entering: 1675 West Leg Total: 2714	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Cars</td><td>355</td></tr> <tr><td>Trucks</td><td>7</td></tr> <tr><td>Heavys</td><td>15</td></tr> <tr><td>Totals</td><td>377</td></tr> </table>	Cars	355	Trucks	7	Heavys	15	Totals	377	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Cars</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Trucks</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Heavys</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Totals</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> </table>	Cars	0	0	0	0	Trucks	0	0	0	0	Heavys	0	0	0	0	Totals	0	0	0	0	Peds Cross: South Peds: 0 South Entering: 0 South Leg Total: 377
Cars	355																														
Trucks	7																														
Heavys	15																														
Totals	377																														
Cars	0	0	0	0																											
Trucks	0	0	0	0																											
Heavys	0	0	0	0																											
Totals	0	0	0	0																											

Comments

Accu-Traffic Inc.

Total Count Diagram

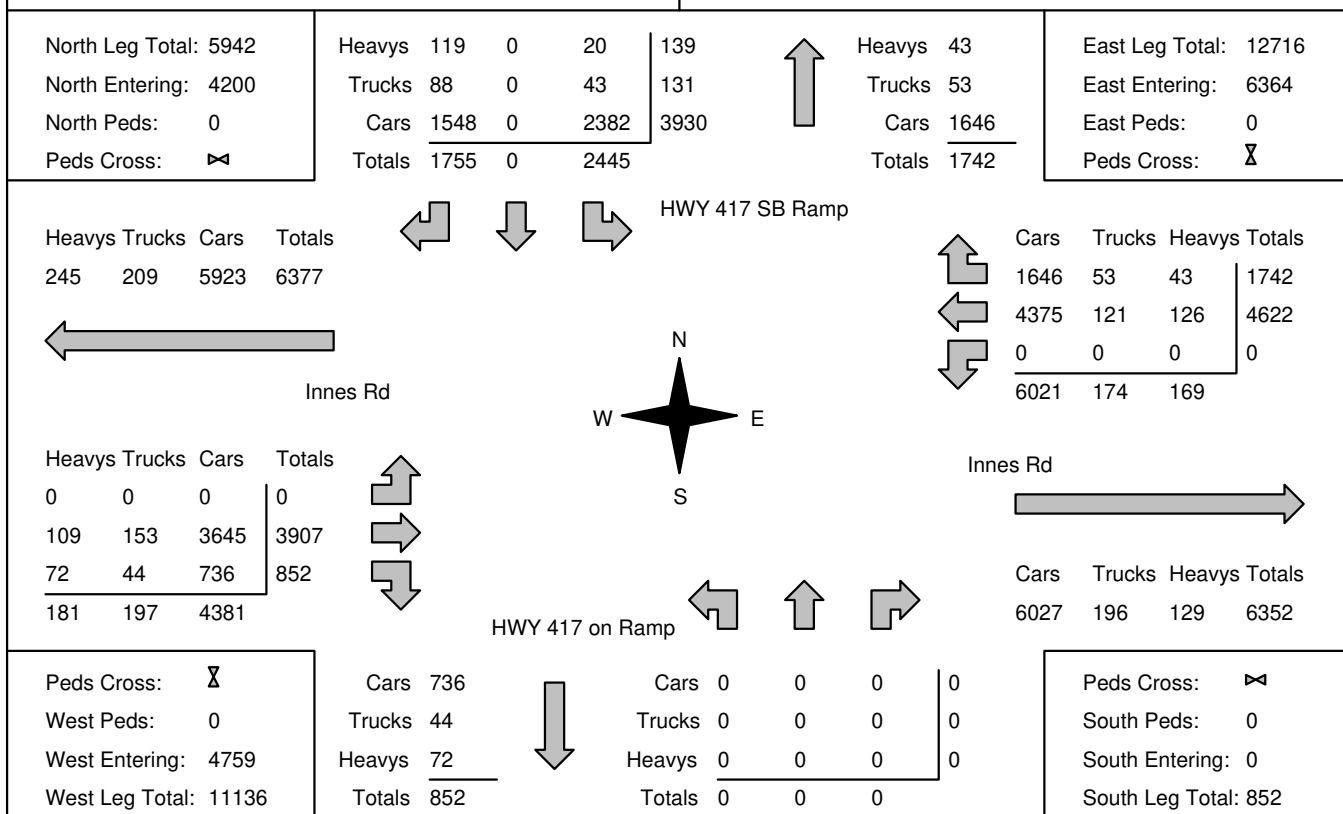
Municipality: Ottawa
Site #: 2509300005
Intersection: Innes Rd & HWY 417 SB Ramp
TFR File #: 1
Count date: 12-Jun-25

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Innes Rd runs W/E



Comments

Accu-Traffic Inc.

Traffic Count Summary

Intersection: Innes Rd & HWY 417 SB Ramp

Count Date: 12-Jun-25

Municipality: Ottawa

North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	323	0	669	992	0	992	8:00:00	0	0	0	0	0
9:00:00	365	0	584	949	0	949	9:00:00	0	0	0	0	0
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	917	0	259	1176	0	1176	17:00:00	0	0	0	0	0
18:00:00	840	0	243	1083	0	1083	18:00:00	0	0	0	0	0

[illegible]

[illegible]

Accu-Traffic Inc.

Count Date: 12-Jun-25 Site #: 2509300005

[illegible]

[illegible]

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period

From: 7:00:00

To: 9:00:00

One Hour Peak

From: 7:30:00

To: 8:30:00

Municipality: Ottawa

Site #: 2509300006

Intersection: Innes Rd & HWY 417 NB Ramp

TFR File #: 1

Count date: 12-Jun-25

Weather conditions:

Person counted:

Person prepared:

Person checked:

** Signalized Intersection **

Major Road: Innes Rd runs W/E

North Leg Total: 1012

North Entering: 0

North Peds: 0

Peds Cross: 

Heavys	0	0	0	0
Trucks	0	0	0	0
Cars	0	0	0	0
Totals	0	0	0	0



Heavys 8

Trucks 24

Cars 980

Totals 1012

East Leg Total: 4253

East Entering: 2826

East Peds: 0

Peds Cross: 

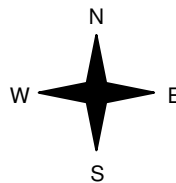
Heavys	Trucks	Cars	Totals
40	50	2120	2210



HWY 417 on Ramp

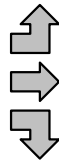


Innes Rd



Cars	Trucks	Heavys	Totals
980	24	8	1012
1756	30	28	1814
0	0	0	0
2736	54	36	

Heavys	Trucks	Cars	Totals
0	0	0	0
25	51	782	858
26	26	146	198
51	77	928	



HWY 417 NB Ramp

Innes Rd



Cars	Trucks	Heavys	Totals
1296	80	51	1427

Peds Cross: 

West Peds: 0

West Entering: 1056

West Leg Total: 3266

Cars	146
Trucks	26
Heavys	26
Totals	198



Cars	364	0	514	878
Trucks	20	0	29	49
Heavys	12	0	26	38
Totals	396	0	569	

Peds Cross: 

South Peds: 1

South Entering: 965

South Leg Total: 1163

Comments

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period

From: 16:00:00

To: 18:00:00

One Hour Peak

From: 16:00:00

To: 17:00:00

Municipality: Ottawa

Site #: 2509300006

Intersection: Innes Rd & HWY 417 NB Ramp

TFR File #: 1

Count date: 12-Jun-25

Weather conditions:

Person counted:

Person prepared:

Person checked:

** Signalized Intersection **

Major Road: Innes Rd runs W/E

North Leg Total: 632

North Entering: 0

North Peds: 0

Peds Cross: 

Heavys	0	0	0	0
Trucks	0	0	0	0
Cars	0	0	0	0
Totals	0	0	0	0



Heavys 6

Trucks 7

Cars 619

Totals 632

East Leg Total: 4185

East Entering: 1709

East Peds: 1

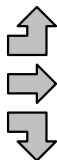
Peds Cross: 

Heavys	Trucks	Cars	Totals
57	35	1147	1239

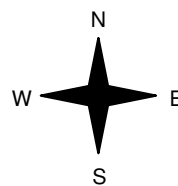


Innes Rd

Heavys	Trucks	Cars	Totals
0	0	0	0
7	16	1818	1841
7	3	320	330
14	19	2138	



HWY 417 NB Ramp



Cars	Trucks	Heavys	Totals
619	7	6	632
1028	27	22	1077
0	0	0	0
1647	34	28	

Innes Rd



Cars	Trucks	Heavys	Totals
2432	27	17	2476

Peds Cross: 

West Peds: 0

West Entering: 2171

West Leg Total: 3410

Cars	320
Trucks	3
Heavys	7
Totals	330



Cars	119	0	614	733
Trucks	8	0	11	19
Heavys	35	0	10	45
Totals	162	0	635	

Peds Cross: 

South Peds: 1

South Entering: 797

South Leg Total: 1127

Comments

Accu-Traffic Inc.

Total Count Diagram

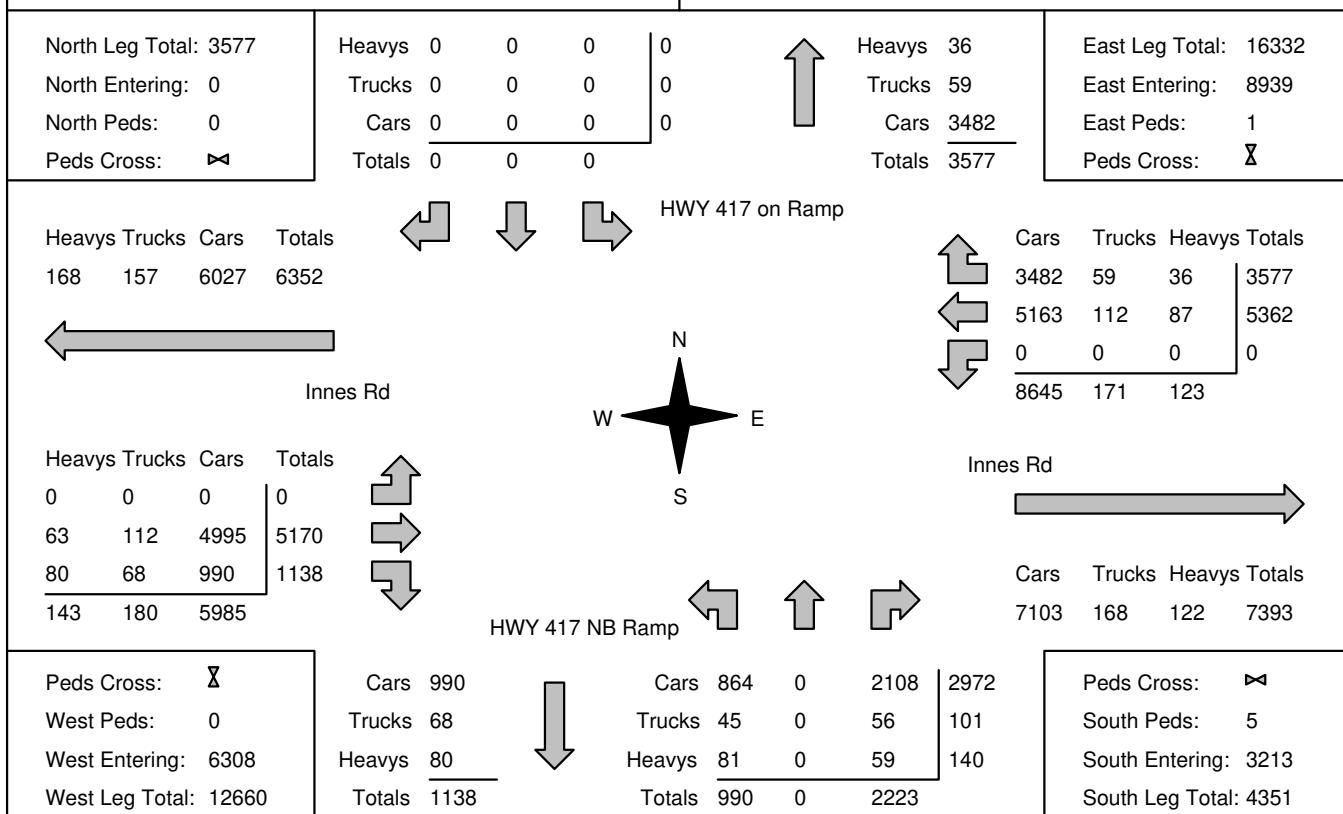
Municipality: Ottawa
Site #: 2509300006
Intersection: Innes Rd & HWY 417 NB Ramp
TFR File #: 1
Count date: 12-Jun-25

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Innes Rd runs W/E



Comments

Accu-Traffic Inc.

Traffic Count Summary

Intersection: Innes Rd & HWY 417 NB Ramp						Count Date: 12-Jun-25		Municipality: Ottawa				
North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	0	0	0	0	0	846	8:00:00	368	0	478	846	1
9:00:00	0	0	0	0	0	874	9:00:00	314	0	560	874	2
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	0	0	0	0	0	797	17:00:00	162	0	635	797	1
18:00:00	0	0	0	0	0	696	18:00:00	146	0	550	696	1
Totals:	0	0	0	0	0	3213	S Totals:	990	0	2223	3213	5
East Approach Totals						East/West Total Approaches	West Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	0	1554	1346	2900	0	3907	8:00:00	0	758	249	1007	0
9:00:00	0	1795	842	2637	0	3752	9:00:00	0	892	223	1115	0
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	0	1077	632	1709	1	3880	17:00:00	0	1841	330	2171	0
18:00:00	0	936	757	1693	0	3708	18:00:00	0	1679	336	2015	0
Totals:	0	5362	3577	8939	1	15247	W Totals:	0	5170	1138	6308	0
Calculated Values for Traffic Crossing Major Street												
Hours Ending:	7:00	8:00	9:00	16:00				17:00	18:00	0:00	0:00	
Crossing Values:	0	368	314	0				163	146	0	0	

Accu-Traffic Inc.

Count Date: 12-Jun-25 **Site #:** 2509300006

[illegible]

Accu-Traffic Inc.

Count Date: 12-Jun-25 **Site #:** 2509300006

[illegible]

[illegible]

[illegible]

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period

From: 7:00:00

To: 9:00:00

One Hour Peak

From: 7:30:00

To: 8:30:00

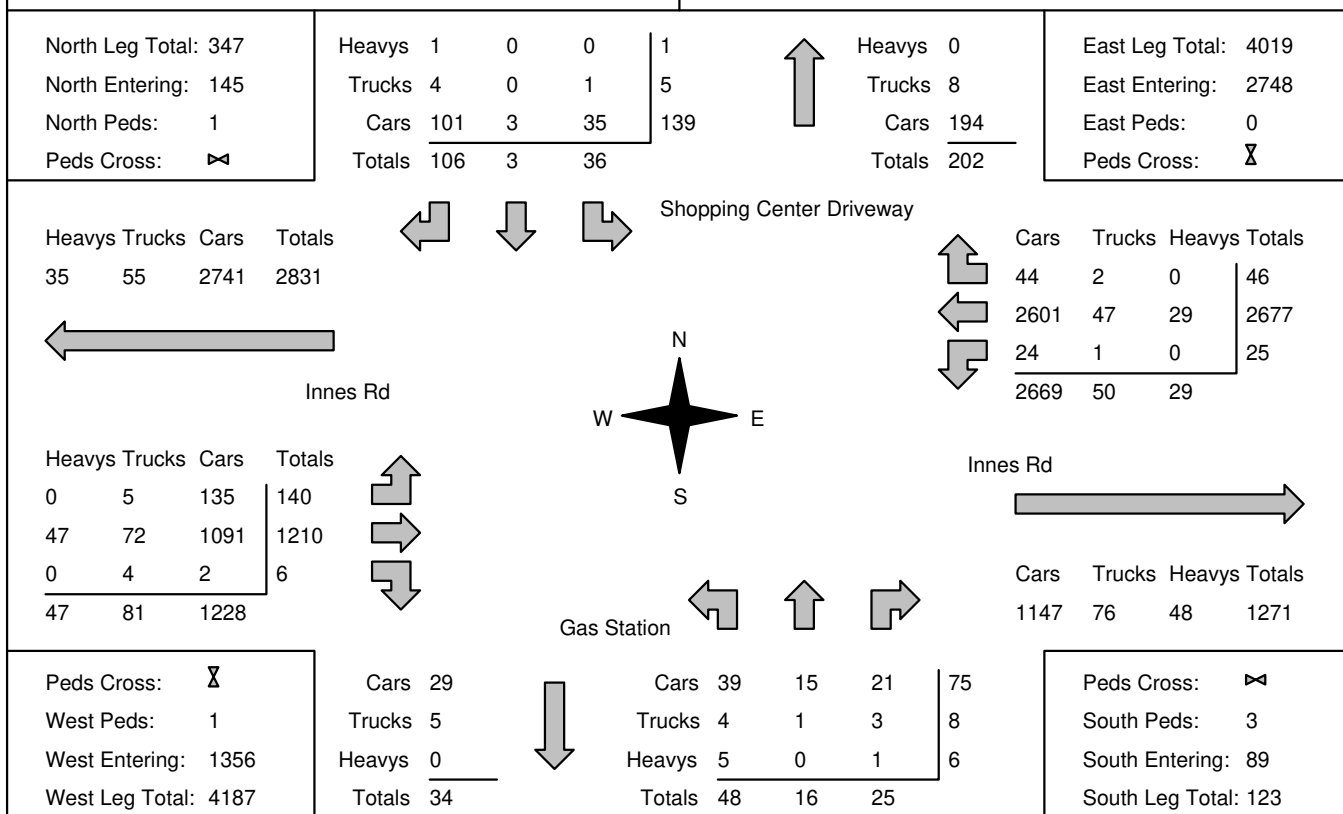
Municipality: Ottawa
Site #: 2509300007
Intersection: Innes Rd & Shopping Center Drive
TFR File #: 1
Count date: 12-Jun-25

Weather conditions:

Person counted:
Person prepared:
Person checked:

** Signalized Intersection **

Major Road: Innes Rd runs W/E



Comments

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period

From: 16:00:00

To: 18:00:00

One Hour Peak

From: 16:00:00

To: 17:00:00

Municipality: Ottawa

Site #: 2509300007

Intersection: Innes Rd & Shopping Center Drive

TFR File #: 1

Count date: 12-Jun-25

Weather conditions:

Person counted:

Person prepared:

Person checked:

** Signalized Intersection **

Major Road: Innes Rd runs W/E

North Leg Total: 474

North Entering: 257

North Peds: 1

Peds Cross: 

Heavys	0	0	0	0
Trucks	0	0	1	1
Cars	168	13	75	256
Totals	168	13	76	



Heavys 1

Trucks 5

Cars 211

Totals 217

East Leg Total: 3977

East Entering: 1587

East Peds: 3

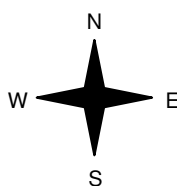
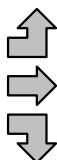
Peds Cross: 

Heavys	Trucks	Cars	Totals
28	34	1652	1714



Innes Rd

Heavys	Trucks	Cars	Totals
0	3	129	132
13	20	2252	2285
2	1	5	8
15	24	2386	



Shopping Center Driveway



Cars	Trucks	Heavys	Totals
61	1	0	62
1446	29	26	1501
21	1	2	24
1528	31	28	

Innes Rd



Cars	Trucks	Heavys	Totals
2354	22	14	2390

Peds Cross: 

West Peds: 2

West Entering: 2425

West Leg Total: 4139

Cars 39

Trucks 2

Heavys 4

Totals 45



Gas Station

Cars 38 21 27 86

Trucks 5 1 1 7

Heavys 2 1 1 4

Totals 45 23 29

Peds Cross: 

South Peds: 5

South Entering: 97

South Leg Total: 142

Comments

Accu-Traffic Inc.

Total Count Diagram

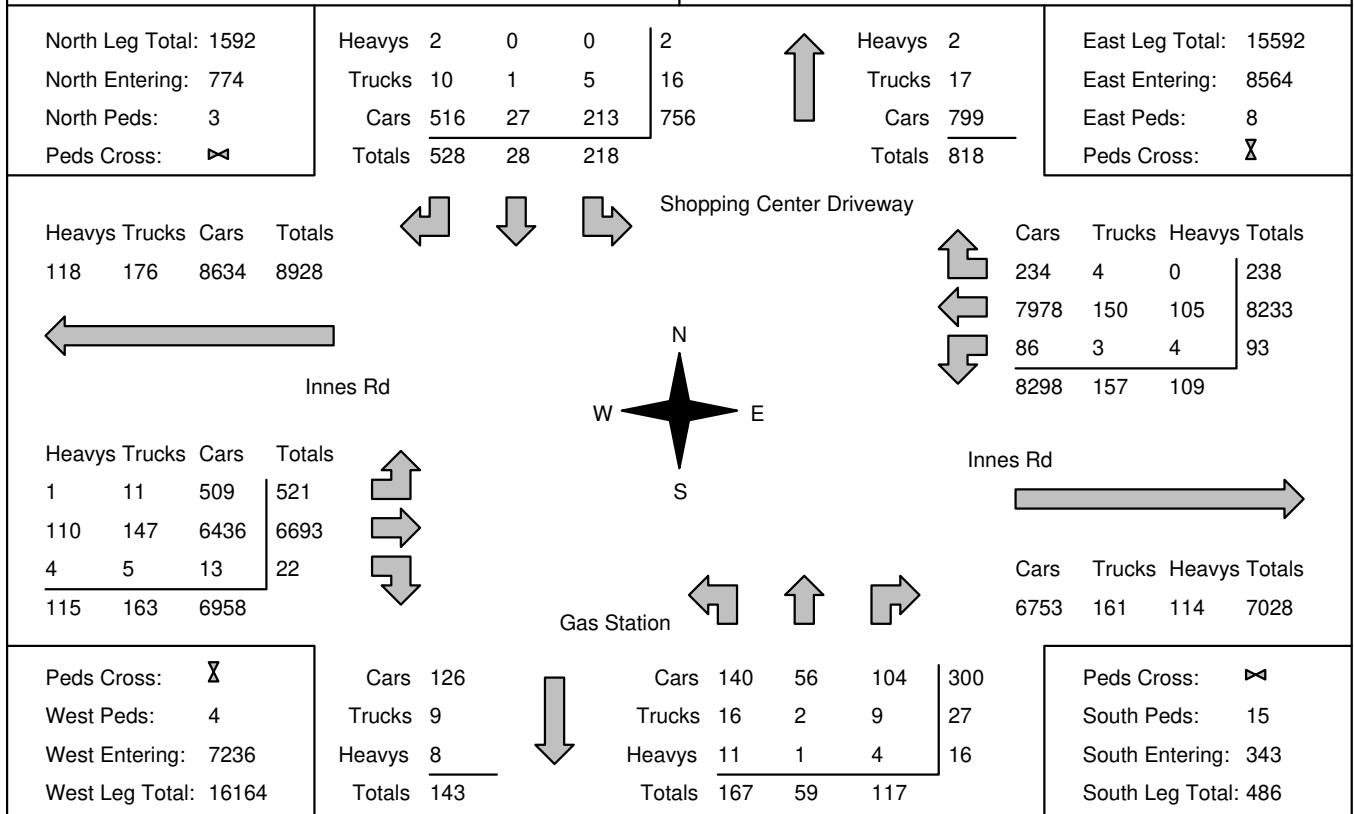
Municipality: Ottawa
Site #: 2509300007
Intersection: Innes Rd & Shopping Center Drive
TFR File #: 1
Count date: 12-Jun-25

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Innes Rd runs W/E



Comments

Accu-Traffic Inc.

Traffic Count Summary

Intersection: Innes Rd & Shopping Center Drive						Count Date: 12-Jun-25		Municipality: Ottawa				
North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	23	0	75	98	2	173	8:00:00	35	12	28	75	1
9:00:00	44	7	111	162	0	239	9:00:00	41	11	25	77	5
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	76	13	168	257	1	354	17:00:00	45	23	29	97	5
18:00:00	75	8	174	257	0	351	18:00:00	46	13	35	94	4
						</						

[illegible]

[illegible]

[illegible]

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period

From: 7:00:00

To: 9:00:00

One Hour Peak

From: 7:30:00

To: 8:30:00

Municipality: Ottawa

Site #: 2509300001

Intersection: Innes Rd & Cyrville Rd

TFR File #: 1

Count date: 12-Jun-25

Weather conditions:

Person counted:

Person prepared:

Person checked:

**** Signalized Intersection ****

Major Road: Innes Rd runs W/E

North Leg Total: 956

North Entering: 291

North Peds: 5

Peds Cross: 

Heavys	6	0	3	9
Trucks	3	1	0	4
Cars	138	28	112	278
Totals	147	29	115	



Heavys 15

Trucks 5

Cars 645

Totals 665

East Leg Total: 4128

East Entering: 2963

East Peds: 5

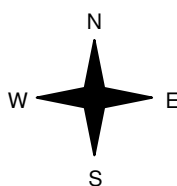
Peds Cross: 

Heavys	Trucks	Cars	Totals
28	50	2669	2747



Innes Rd

Heavys	Trucks	Cars	Totals
3	4	103	110
36	64	909	1009
8	8	125	141
47	76	1137	



Cyrville Rd



Cars	Trucks	Heavys	Totals
476	0	8	484
2387	28	14	2429
45	3	2	50
2908	31	24	

Innes Rd



Cars	Trucks	Heavys	Totals
1055	69	41	1165

Peds Cross: 

West Peds: 6

West Entering: 1260

West Leg Total: 4007

Cars 198

Trucks 12

Heavys 10

Totals 220



Cars 144 66 34 244

Trucks 19 1 5 25

Heavys 8 4 2 14

Totals 171 71 41

Peds Cross: 

South Peds: 6

South Entering: 283

South Leg Total: 503

Comments

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period

From: 16:00:00

To: 18:00:00

One Hour Peak

From: 16:15:00

To: 17:15:00

Municipality: Ottawa

Site #: 2509300001

Intersection: Innes Rd & Cyrville Rd

TFR File #: 1

Count date: 12-Jun-25

Weather conditions:

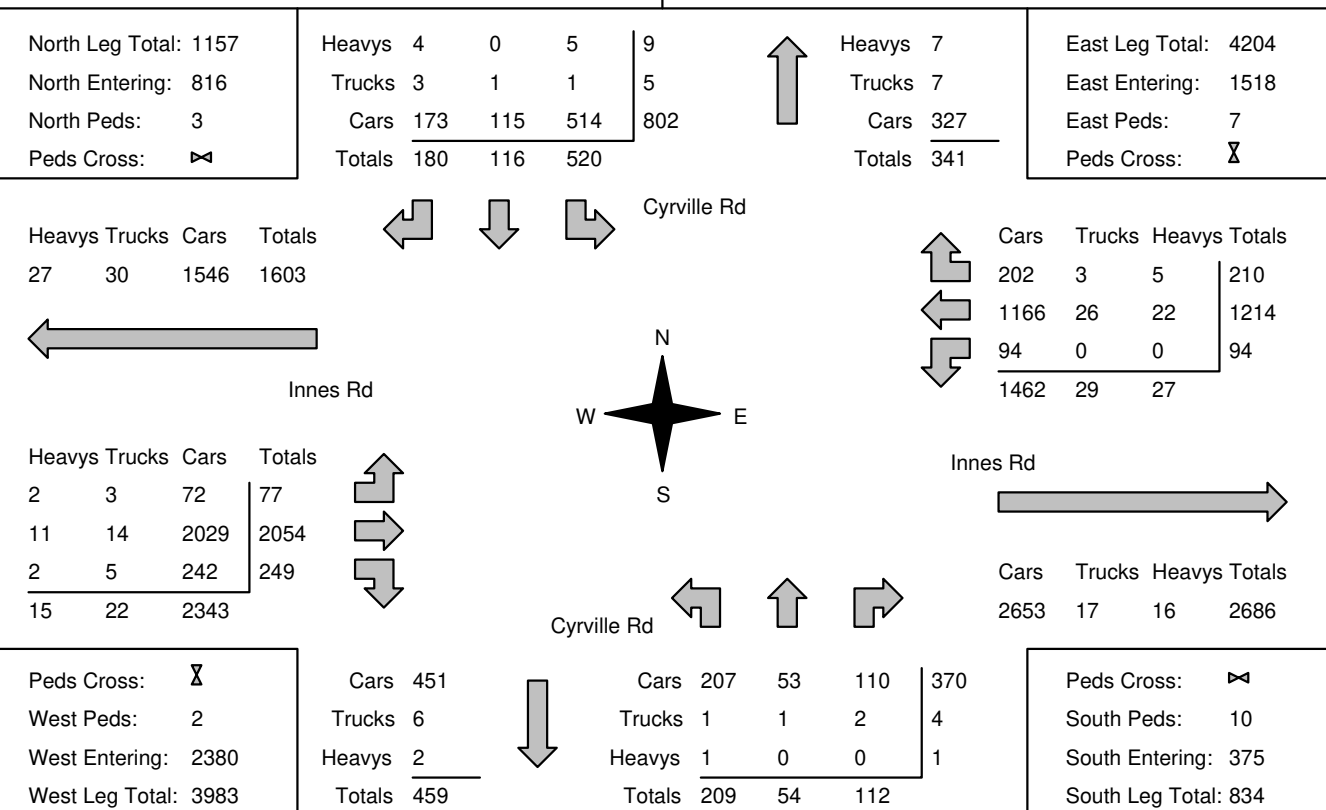
Person counted:

Person prepared:

Person checked:

** Signalized Intersection **

Major Road: Innes Rd runs W/E



Comments

Accu-Traffic Inc.

Total Count Diagram

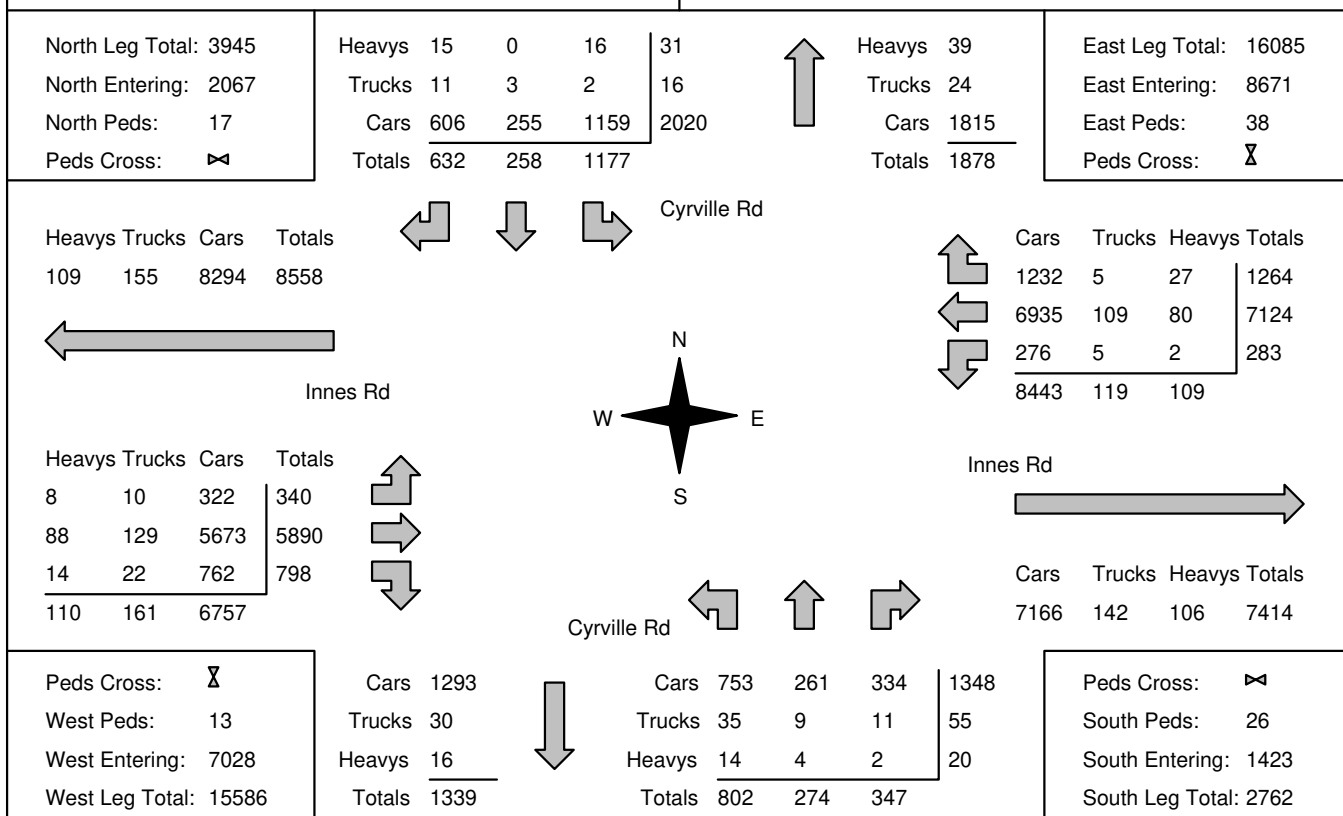
Municipality: Ottawa
Site #: 2509300001
Intersection: Innes Rd & Cyrville Rd
TFR File #: 1
Count date: 12-Jun-25

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Innes Rd runs W/E



Comments

Accu-Traffic Inc.

Traffic Count Summary

Intersection: Innes Rd & Cyrville Rd						Count Date: 12-Jun-25		Municipality: Ottawa				
North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	108	29	135	272	4	564	8:00:00	195	55	42	292	5
9:00:00	124	36	134	294	4	598	9:00:00	169	86	49	304	4
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	530	91	183	804	4	1181	17:00:00	210	54	113	377	6
18:00:00	415	102	180	697	5	1147	18:00:00	228	79	143	450	11

Accu-Traffic Inc.

Count Date: 12-Jun-25 Site #: 2509300001

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[illegible]

[illegible]

[illegible]

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period

From: 7:00:00

To: 9:00:00

One Hour Peak

From: 7:30:00

To: 8:30:00

Municipality: Ottawa

Site #: 2509300008

Intersection: Innes Rd & Stonehenge Cres W

TFR File #: 1

Count date: 12-Jun-25

Weather conditions:

Person counted:

Person prepared:

Person checked:

** Signalized Intersection **

Major Road: Innes Rd runs W/E

North Leg Total: 118

North Entering: 92

North Peds: 8

Peds Cross: 

Heavys	1	0	0	1
Trucks	0	0	0	0
Cars	74	4	13	91
Totals	75	4	13	



Heavys 1

Trucks 1

Cars 24

Totals 26

East Leg Total: 3999

East Entering: 2890

East Peds: 2

Peds Cross: 

Heavys	Trucks	Cars	Totals
24	29	2849	2902



Innes Rd

Stonehenge Cres W

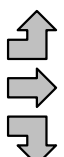


Cars	Trucks	Heavys	Totals
8	0	0	8
2770	28	23	2821
58	2	1	61
2836	30	24	

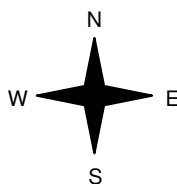
Innes Rd



Heavys	Trucks	Cars	Totals
1	1	14	16
38	65	967	1070
3	2	4	9
42	68	985	



Innes Road Plaza Driveway



Cars	Trucks	Heavys	Totals
1000	71	38	1109

Peds Cross: 

West Peds: 5

West Entering: 1095

West Leg Total: 3997

Cars	66
Trucks	4
Heavys	4
Totals	74



Cars	5	2	20	27
Trucks	1	0	6	7
Heavys	0	0	0	0
Totals	6	2	26	

Peds Cross: 

South Peds: 2

South Entering: 34

South Leg Total: 108

Comments

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period

From: 16:00:00

To: 18:00:00

One Hour Peak

From: 16:15:00

To: 17:15:00

Municipality: Ottawa

Site #: 2509300008

Intersection: Innes Rd & Stonehenge Cres W

TFR File #: 1

Count date: 12-Jun-25

Weather conditions:

Person counted:

Person prepared:

Person checked:

** Signalized Intersection **

Major Road: Innes Rd runs W/E

North Leg Total: 169

North Entering: 75

North Peds: 14

Peds Cross: 

Heavys	1	0	0	1
Trucks	1	0	0	1
Cars	49	5	19	73
Totals	51	5	19	



Heavys 0

Trucks 0

Cars 94

Totals 94

East Leg Total: 4201

East Entering: 1528

East Peds: 8

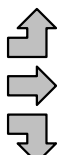
Peds Cross: 

Heavys	Trucks	Cars	Totals
27	27	1467	1521

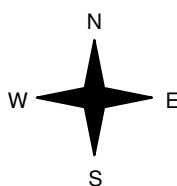


Innes Rd

Heavys	Trucks	Cars	Totals
0	0	63	63
17	16	2559	2592
0	0	7	7
17	16	2629	



Innes Road Plaza Driveway



Stonehenge Cres W



Cars	Trucks	Heavys	Totals
21	0	0	21
1400	25	25	1450
55	2	0	57
1476	27	25	

Innes Rd



Cars	Trucks	Heavys	Totals
2639	17	17	2673

Peds Cross: 

West Peds: 5

West Entering: 2662

West Leg Total: 4183

Cars	67
Trucks	2
Heavys	0
Totals	69



Cars	18	10	61	89
Trucks	1	0	1	2
Heavys	1	0	0	1
Totals	20	10	62	

Peds Cross: 

South Peds: 7

South Entering: 92

South Leg Total: 161

Comments

Accu-Traffic Inc.

Total Count Diagram

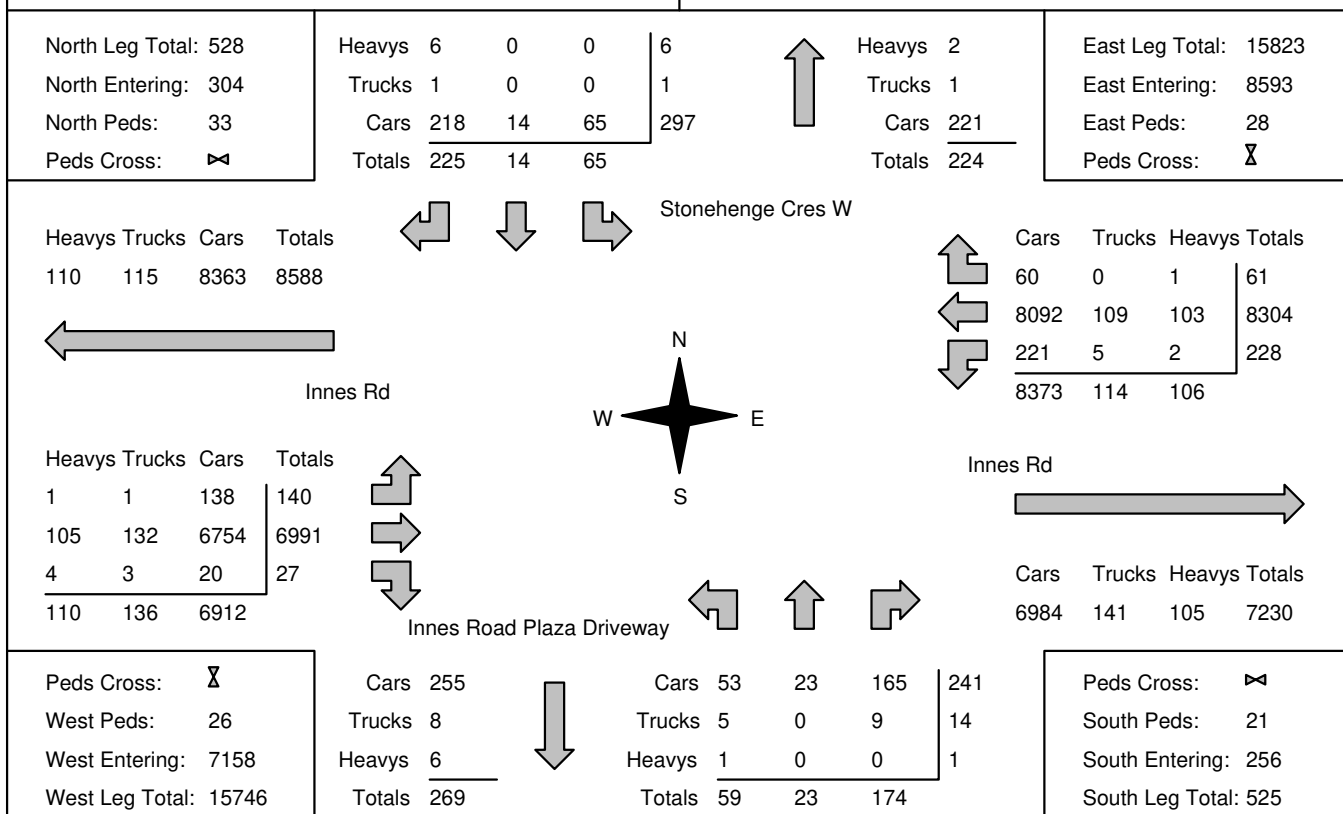
Municipality: Ottawa
Site #: 2509300008
Intersection: Innes Rd & Stonehenge Cres W
TFR File #: 1
Count date: 12-Jun-25

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Innes Rd runs W/E



Comments

Accu-Traffic Inc.

Traffic Count Summary

Intersection: Innes Rd & Stonehenge Cres W					Count Date: 12-Jun-25			Municipality: Ottawa				
North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	6	6	65	77	4	109	8:00:00	8	4	20	32	1
9:00:00	16	2	72	90	9	134	9:00:00	8	3	33	44	10
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	25	4	42	71	12	154	17:00:00	18	12	53	83	3
18:00:00	18	2	46	66	8	163	18:00:00	25	4	68	97	7

[illegible]

[illegible]

Accu-Traffic Inc.

Count Date: 12-Jun-25 **Site #:** 2509300008

[illegible]

Accu-Traffic Inc.

Count Date: 12-Jun-25 **Site #:** 2509300008

[illegible]

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period

From: 7:00:00

To: 9:00:00

One Hour Peak

From: 8:00:00

To: 9:00:00

Municipality: Ottawa
Site #: 2509300002
Intersection: Cyrville Rd & Costco Driveway Nort
TFR File #: 1
Count date: 12-Jun-25

Weather conditions:

Person counted:
Person prepared:
Person checked:

** Non-Signalized Intersection **

Major Road: Cyrville Rd runs N/S

North Leg Total: 570

North Entering: 273

North Peds: 0

Peds Cross: 

	Heavys	Trucks	Cars	Totals
North	1	3	1	5
Trucks	3	1	4	8
Cars	93	107	60	260
Totals	97	111	65	



Heavys 11

Trucks 26

Cars 260

Totals 297

East Leg Total: 225

East Entering: 147

East Peds: 2

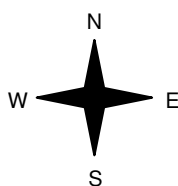
Peds Cross: 

Heavys	Trucks	Cars	Totals
1	9	93	103



Costco Driveway North

Heavys	Trucks	Cars	Totals
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0



Cyrville Rd



Cars	Trucks	Heavys	Totals
131	10	6	147
0	0	0	0
0	0	0	0
131	10	6	

Innes Road Plaza Driveway



Cars	Trucks	Heavys	Totals
70	7	1	78

Peds Cross: 

West Peds: 0

West Entering: 0

West Leg Total: 103

	Cars	Trucks	Heavys	Totals
West	107	1	3	111
Trucks				
Heavys				
Totals	111			



	Cars	Trucks	Heavys	Totals
South	0	6	0	6
Trucks				
Heavys				
Totals	6	150	13	

Peds Cross: 

South Peds: 3

South Entering: 169

South Leg Total: 280

Comments

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period

From: 16:00:00

To: 18:00:00

One Hour Peak

From: 16:45:00

To: 17:45:00

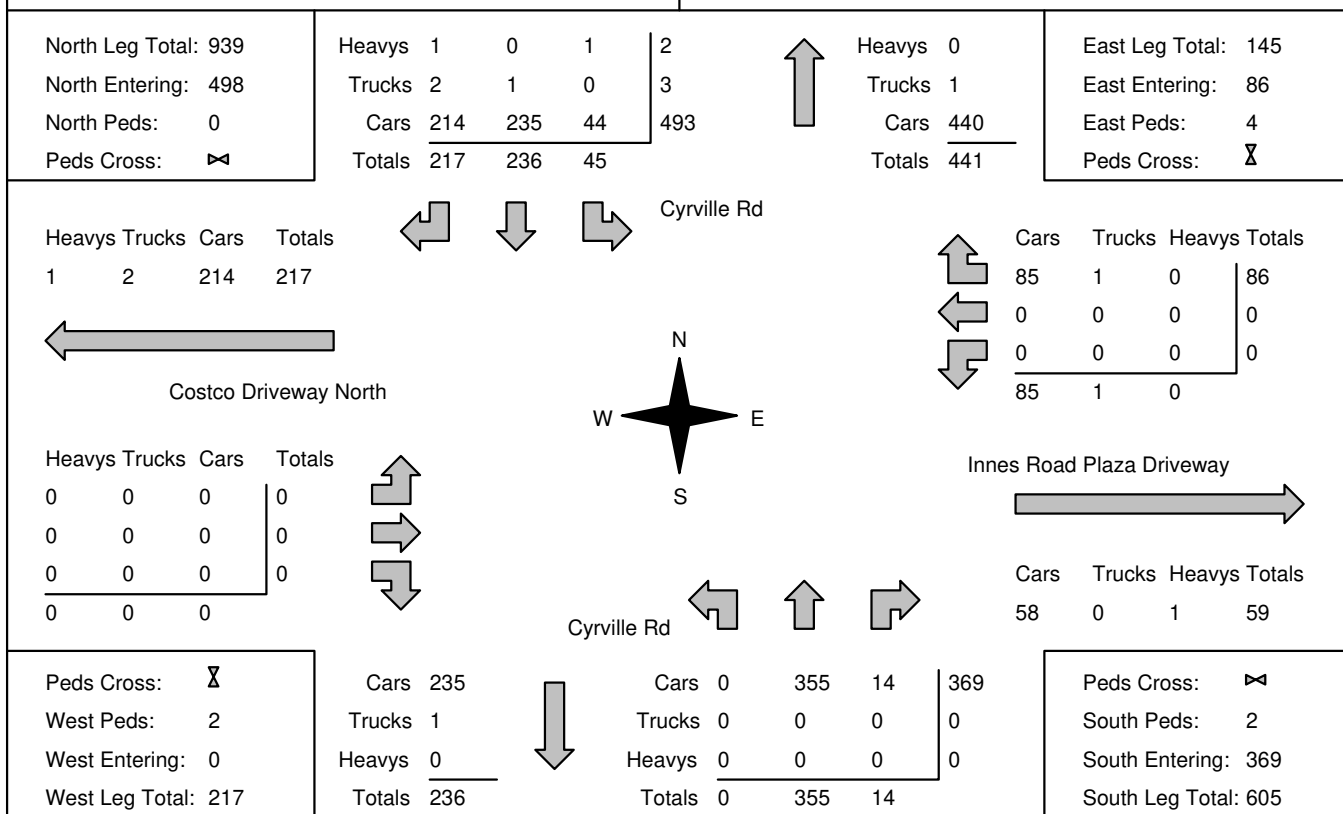
Municipality: Ottawa
Site #: 2509300002
Intersection: Cyrville Rd & Costco Driveway Nort
TFR File #: 1
Count date: 12-Jun-25

Weather conditions:

Person counted:
Person prepared:
Person checked:

** Non-Signalized Intersection **

Major Road: Cyrville Rd runs N/S



Comments

Accu-Traffic Inc.

Total Count Diagram

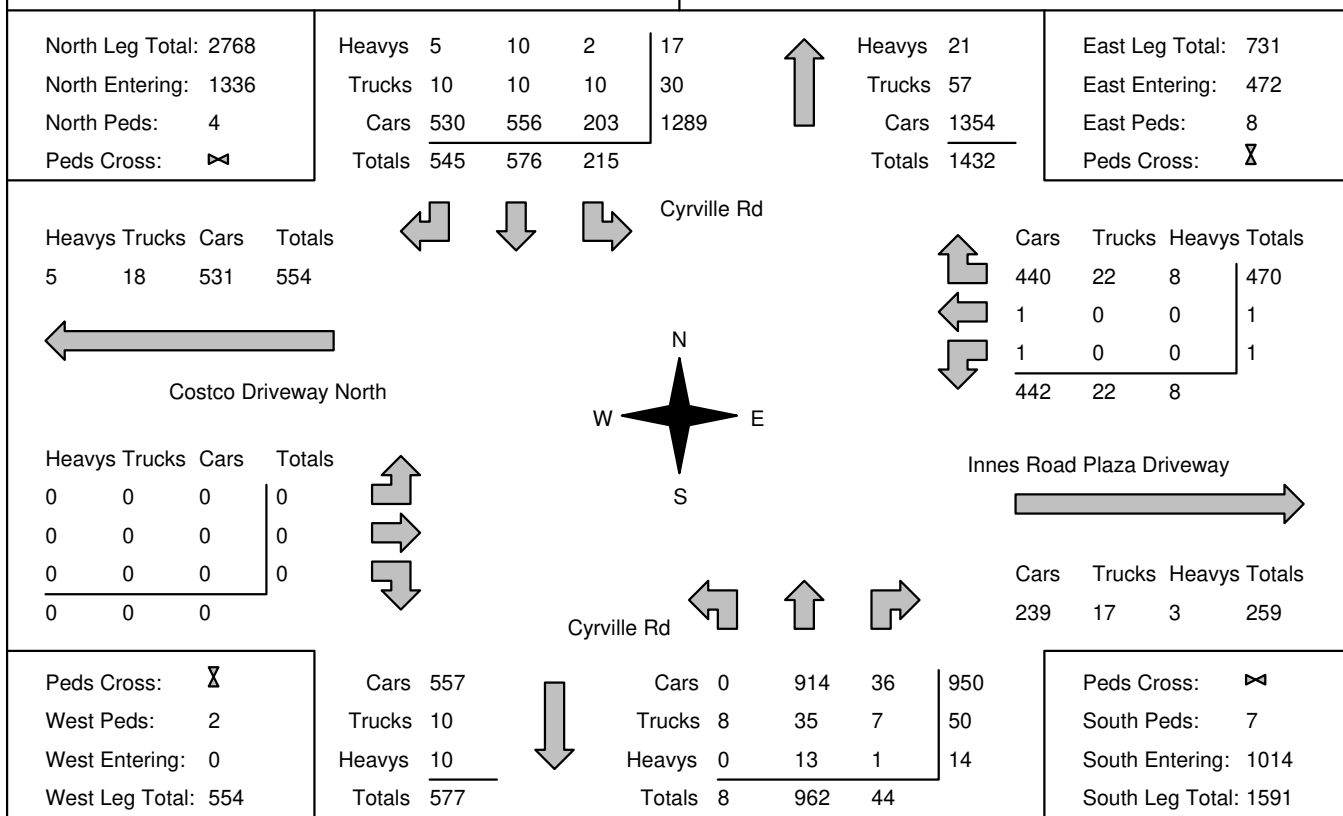
Municipality: Ottawa
Site #: 2509300002
Intersection: Cyrville Rd & Costco Driveway Nort
TFR File #: 1
Count date: 12-Jun-25

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Cyrville Rd runs N/S



Comments

Accu-Traffic Inc.

Traffic Count Summary

Intersection: Cyrville Rd & Costco Driveway No Count Date: 12-Jun-25 Municipality: Ottawa

North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	47	95	60	202	0	350	8:00:00	2	135	11	148	1
9:00:00	65	111	97	273	0	442	9:00:00	6	150	13	169	3
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	54	155	206	415	2	724	17:00:00	0	303	6	309	1
18:00:00	49	215	182	446	2	834	18:00:00	0	374	14	388	2

Accu-Traffic Inc.

Count Date: 12-Jun-25 Site #: 2509300002

[illegible]

Accu-Traffic Inc.

Count Date: 12-Jun-25 Site #: 2509300002

[illegible]

[illegible]

[illegible]

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period

From: 7:00:00

To: 9:00:00

One Hour Peak

From: 8:00:00

To: 9:00:00

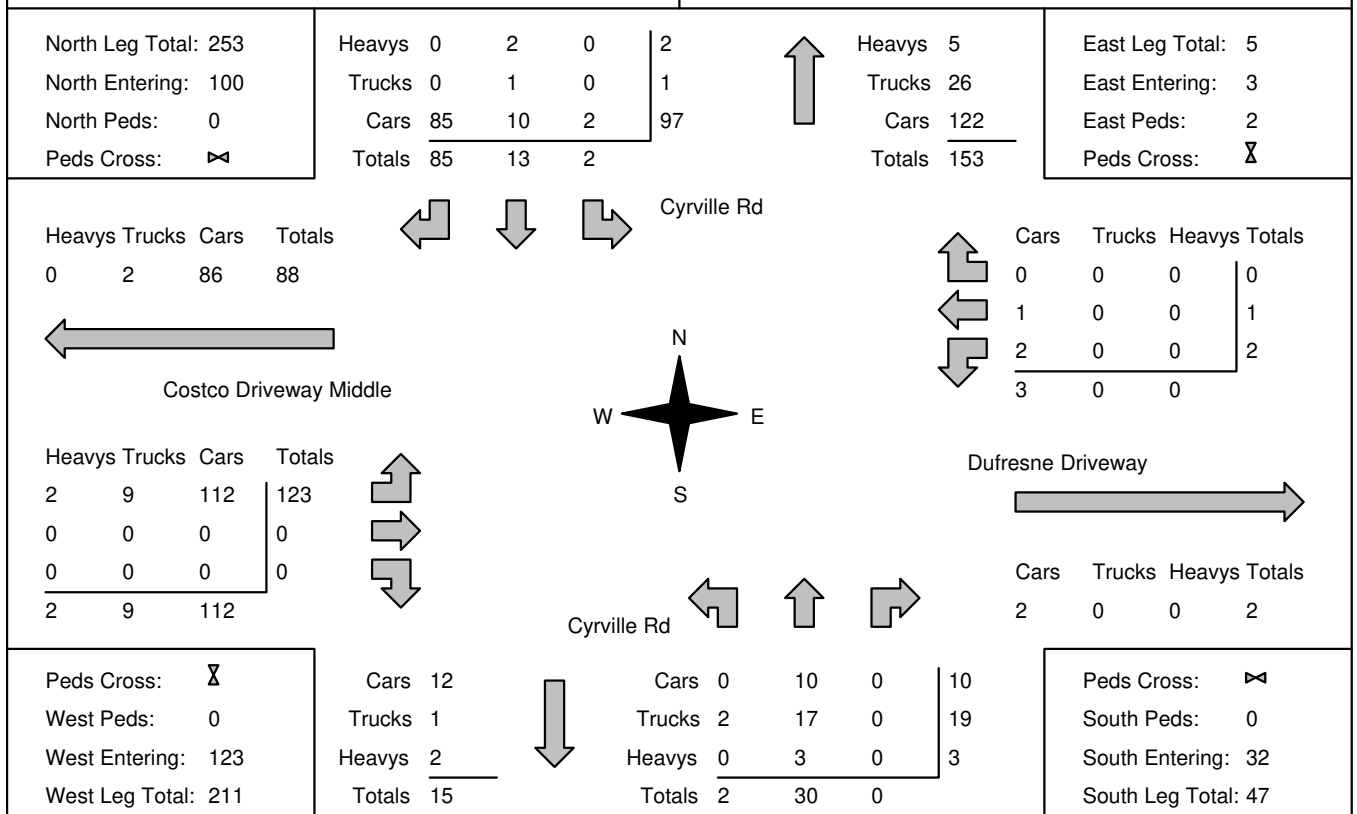
Municipality: Ottawa
Site #: 2509300003
Intersection: Cyrville Rd & Costco Driveway Mid
TFR File #: 1
Count date: 12-Jun-25

Weather conditions:

Person counted:
Person prepared:
Person checked:

** Non-Signalized Intersection **

Major Road: Cyrville Rd runs N/S



Comments

Accu-Traffic Inc.

Afternoon Peak Diagram	Specified Period From: 16:00:00 To: 18:00:00	One Hour Peak From: 16:45:00 To: 17:45:00
Municipality: Ottawa Site #: 2509300003 Intersection: Cyrville Rd & Costco Driveway Mid TFR File #: 1 Count date: 12-Jun-25	Weather conditions: Person counted: Person prepared: Person checked:	
** Non-Signalized Intersection **	Major Road: Cyrville Rd runs N/S	

North Leg Total: 550 North Entering: 176 North Peds: 0 Peds Cross:	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: right;">Heavys</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td rowspan="4" style="text-align: center; vertical-align: middle; width: 20px;"> </td> <td style="text-align: right;">Heavys</td> <td style="text-align: right;">0</td> </tr> <tr> <td style="text-align: right;">Trucks</td> <td style="text-align: right;">0</td> <td style="text-align: right;">1</td> <td style="text-align: right;">0</td> <td style="text-align: right;">1</td> <td style="text-align: right;">Trucks</td> <td style="text-align: right;">0</td> </tr> <tr> <td style="text-align: right;">Cars</td> <td style="text-align: right;">99</td> <td style="text-align: right;">18</td> <td style="text-align: right;">58</td> <td style="text-align: right;">175</td> <td style="text-align: right;">Cars</td> <td style="text-align: right;">374</td> </tr> <tr> <td style="text-align: right;">Totals</td> <td style="text-align: right;">99</td> <td style="text-align: right;">19</td> <td style="text-align: right;">58</td> <td></td> <td style="text-align: right;">Totals</td> <td style="text-align: right;">374</td> </tr> </table>	Heavys	0	0	0	0		Heavys	0	Trucks	0	1	0	1	Trucks	0	Cars	99	18	58	175	Cars	374	Totals	99	19	58		Totals	374	East Leg Total: 96 East Entering: 36 East Peds: 4 Peds Cross:	
Heavys	0	0	0	0		Heavys		0																								
Trucks	0	1	0	1		Trucks		0																								
Cars	99	18	58	175		Cars		374																								
Totals	99	19	58			Totals	374																									

Heavys	Trucks	Cars	Totals
0	1	103	104

Costco Driveway Middle

Cyrville Rd

N
S
W
E

Cars	Trucks	Heavys	Totals
33	0	0	33
2	0	0	2
1	0	0	1
36	0	0	

Dufresne Driveway

Heavys	Trucks	Cars	Totals
0	0	321	321
0	0	2	2
0	2	3	5
0	2	326	

Cyrville Rd

N
S
W
E

Cars	Trucks	Heavys	Totals
60	0	0	60

Peds Cross: West Peds: 0 West Entering: 328 West Leg Total: 432	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: right;">Cars</td> <td style="text-align: right;">22</td> </tr> <tr> <td style="text-align: right;">Trucks</td> <td style="text-align: right;">3</td> </tr> <tr> <td style="text-align: right;">Heavys</td> <td style="text-align: right;">0</td> </tr> <tr> <td style="text-align: right;">Totals</td> <td style="text-align: right;">25</td> </tr> </table>	Cars	22	Trucks	3	Heavys	0	Totals	25	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: right;">Cars</td> <td style="text-align: right;">2</td> <td style="text-align: right;">20</td> <td style="text-align: right;">0</td> <td style="text-align: right;">22</td> </tr> <tr> <td style="text-align: right;">Trucks</td> <td style="text-align: right;">1</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">1</td> </tr> <tr> <td style="text-align: right;">Heavys</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> </tr> <tr> <td style="text-align: right;">Totals</td> <td style="text-align: right;">3</td> <td style="text-align: right;">20</td> <td style="text-align: right;">0</td> <td></td> </tr> </table>	Cars	2	20	0	22	Trucks	1	0	0	1	Heavys	0	0	0	0	Totals	3	20	0		Peds Cross: South Peds: 1 South Entering: 23 South Leg Total: 48
Cars	22																														
Trucks	3																														
Heavys	0																														
Totals	25																														
Cars	2	20	0	22																											
Trucks	1	0	0	1																											
Heavys	0	0	0	0																											
Totals	3	20	0																												

Comments

Accu-Traffic Inc.

Total Count Diagram

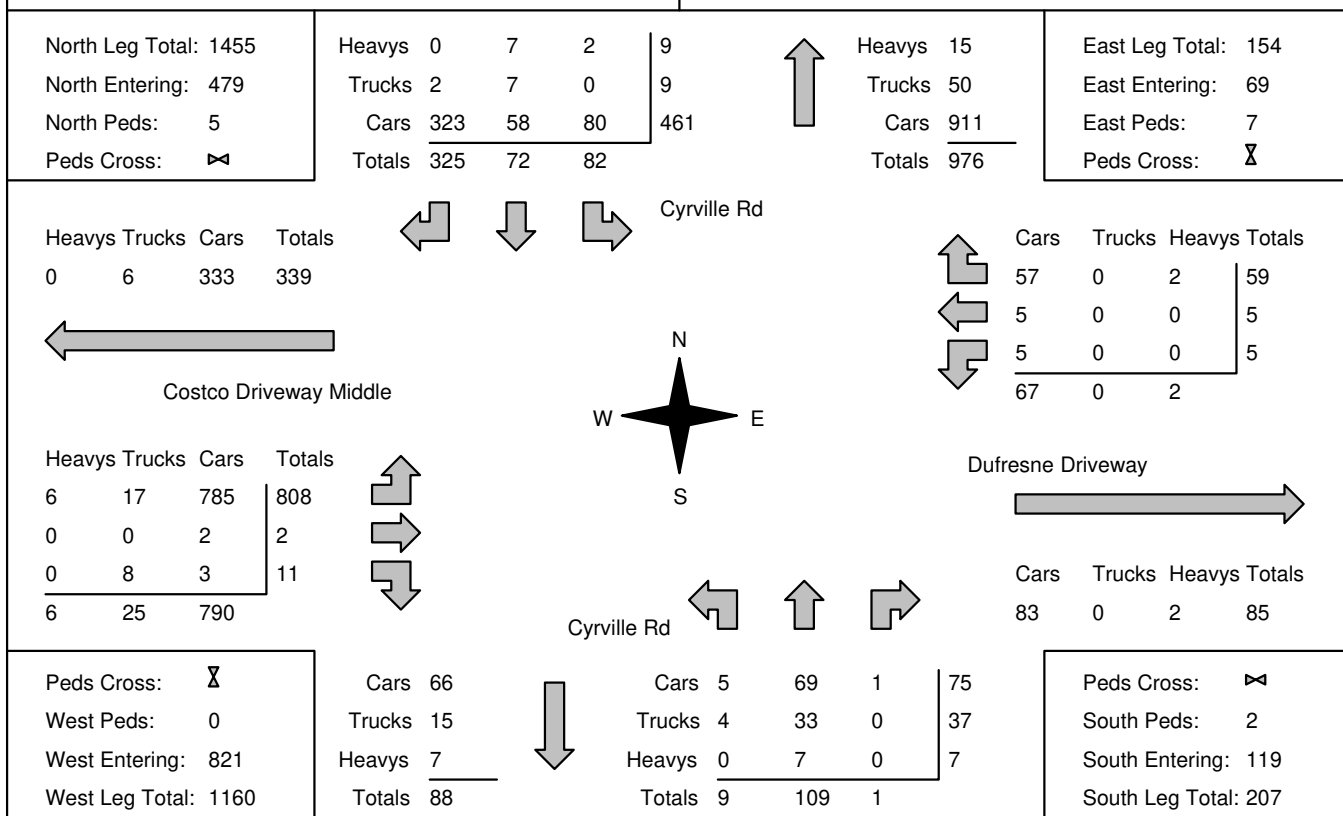
Municipality: Ottawa
Site #: 2509300003
Intersection: Cyrville Rd & Costco Driveway Mid
TFR File #: 1
Count date: 12-Jun-25

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Cyrville Rd runs N/S



Comments

Accu-Traffic Inc.

Traffic Count Summary

Intersection: Cyrville Rd & Costco Driveway Mi					Count Date: 12-Jun-25			Municipality: Ottawa				
North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	4	29	60	93	0	131	8:00:00	2	36	0	38	0
9:00:00	2	13	85	100	0	132	9:00:00	2	30	0	32	0
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	16	15	97	128	1	152	17:00:00	2	21	1	24	1
18:00:00	60	15	83	158	4	183	18:00:00	3	22	0	25	1

[illegible]

[illegible]

Accu-Traffic Inc.

Count Date: 12-Jun-25 Site #: 2509300003

[illegible]

[illegible]

Accu-Traffic Inc.

Mid-day Peak Diagram

Specified Period

From: 11:00:00

To: 14:00:00

One Hour Peak

From: 12:45:00

To: 13:45:00

Municipality: Ottawa

Site #: 2593000005

Intersection: Innes Rd & HWY 417 SB Ramp

TFR File #: 1

Count date: 14-Jun-25

Weather conditions:

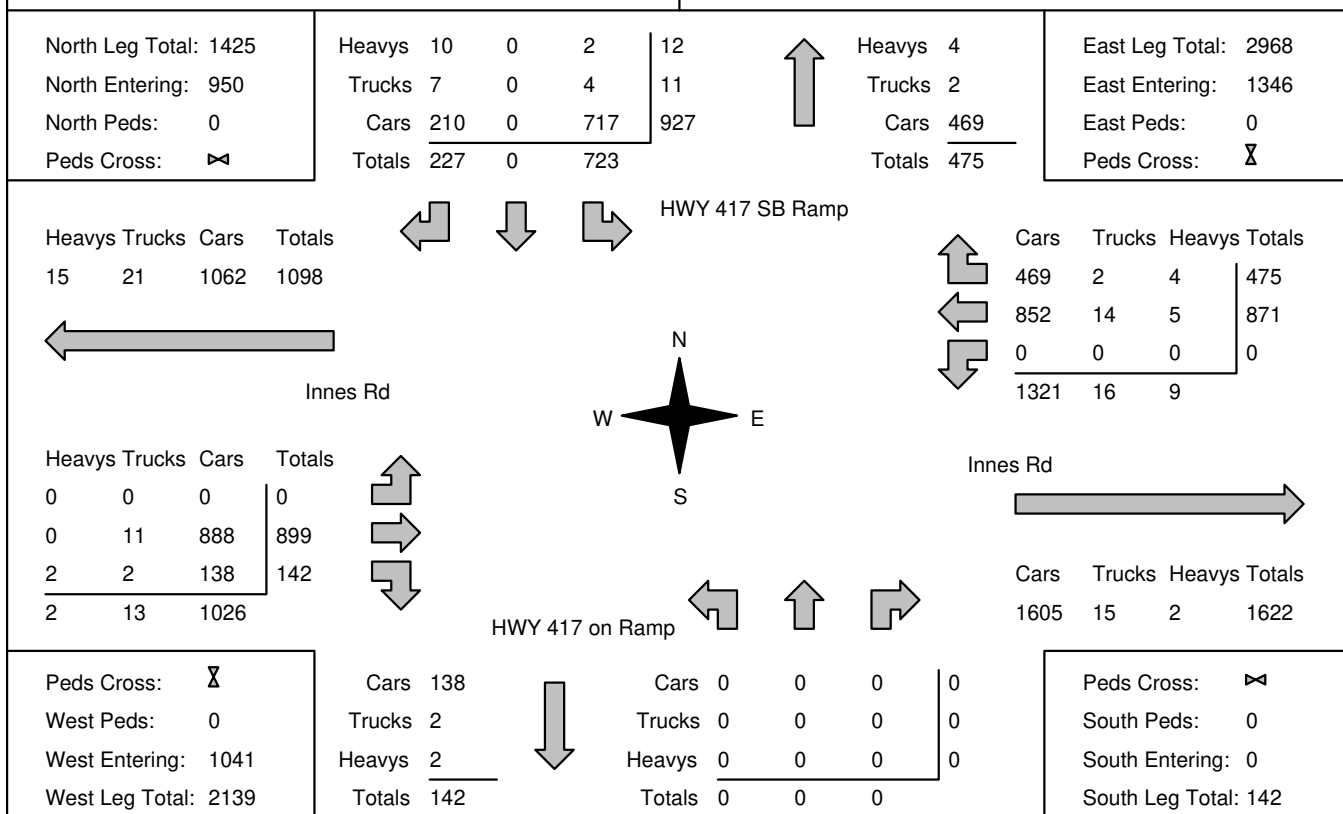
Person counted:

Person prepared:

Person checked:

** Signalized Intersection **

Major Road: Innes Rd runs W/E



Accu-Traffic Inc.

Total Count Diagram

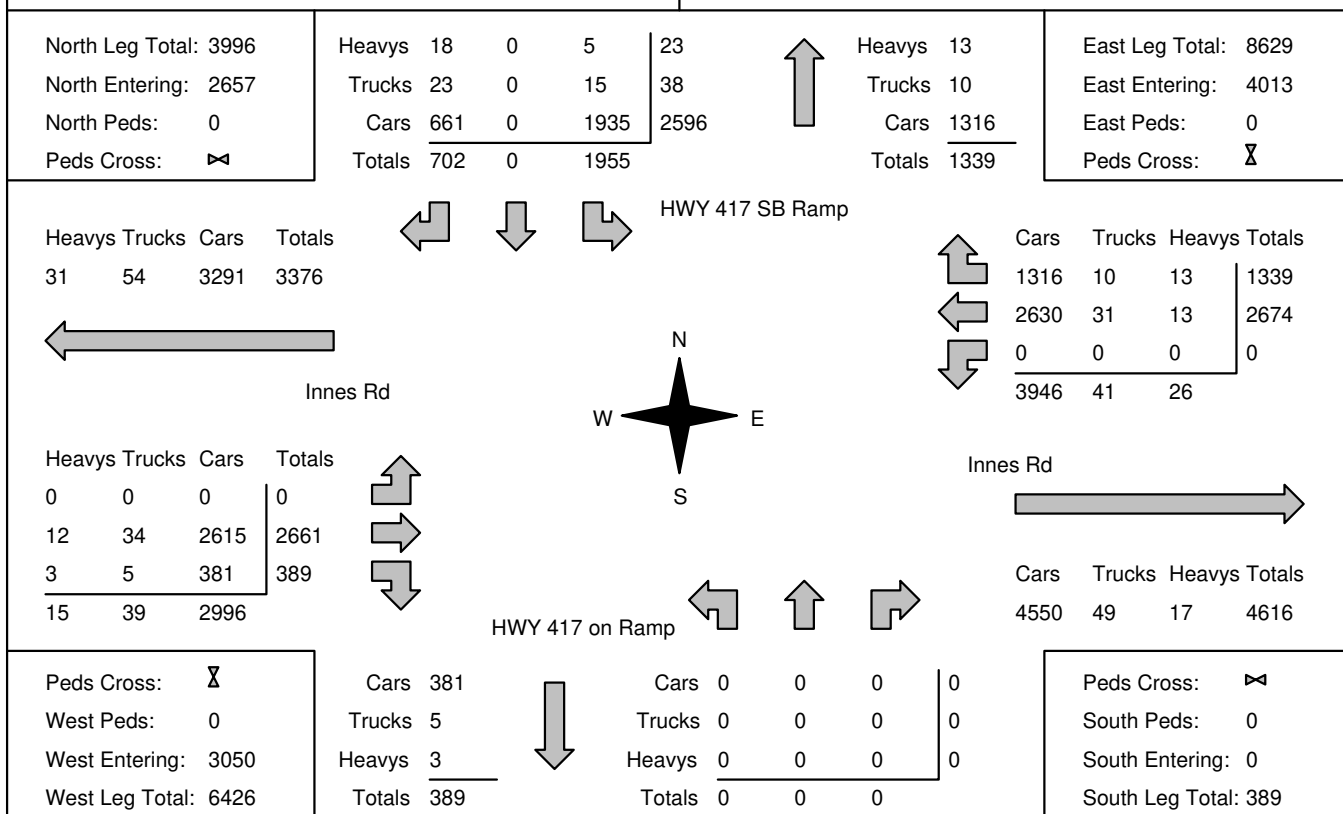
Municipality: Ottawa
Site #: 2593000005
Intersection: Innes Rd & HWY 417 SB Ramp
TFR File #: 1
Count date: 14-Jun-25

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Innes Rd runs W/E



Comments

Accu-Traffic Inc.

Traffic Count Summary

Intersection: Innes Rd & HWY 417 SB Ramp					Count Date: 14-Jun-25			Municipality: Ottawa				
North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
11:00:00	0	0	0	0	0	0	11:00:00	0	0	0	0	0
12:00:00	606	0	248	854	0	854	12:00:00	0	0	0	0	0
13:00:00	636	0	221	857	0	857	13:00:00	0	0	0	0	0
14:00:00	713	0	233	946	0	946	14:00:00	0	0	0	0	0

Accu-Traffic Inc.

Count Date: 14-Jun-25 Site #: 2593000005

[illegible]

[illegible]

Accu-Traffic Inc.

Count Date: 14-Jun-25 Site #: 2593000005

[illegible]

Accu-Traffic Inc.

Mid-day Peak Diagram	Specified Period From: 11:00:00 To: 14:00:00	One Hour Peak From: 12:45:00 To: 13:45:00
Municipality: Ottawa Site #: 2509300006 Intersection: Innes Rd & HWY 417 NB Ramp TFR File #: 1 Count date: 14-Jun-25	Weather conditions: Person counted: Person prepared: Person checked:	
** Signalized Intersection **		Major Road: Innes Rd runs W/E

North Leg Total: 904 North Entering: 0 North Peds: 0 Peds Cross:	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Heavys</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Trucks</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Cars</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Totals</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> </table>	Heavys	0	0	0	0	Trucks	0	0	0	0	Cars	0	0	0	0	Totals	0	0	0	0	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Heavys</td><td>2</td></tr> <tr><td>Trucks</td><td>4</td></tr> <tr><td>Cars</td><td>898</td></tr> <tr><td>Totals</td><td>904</td></tr> </table>	Heavys	2	Trucks	4	Cars	898	Totals	904	East Leg Total: 3917 East Entering: 2096 East Peds: 0 Peds Cross:
Heavys	0	0	0	0																											
Trucks	0	0	0	0																											
Cars	0	0	0	0																											
Totals	0	0	0	0																											
Heavys	2																														
Trucks	4																														
Cars	898																														
Totals	904																														

Heavys	Trucks	Cars	Totals
9	16	1320	1345

HWY 417 on Ramp

Cars	Trucks	Heavys	Totals
898	4	2	904
1178	10	4	1192
0	0	0	0
2076	14	6	

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	0	0
3	9	1361	1373
1	6	219	226
4	15	1580	

HWY 417 NB Ramp

Innes Rd

Heavys	Trucks	Cars	Totals
0	0	0	0
3	9	1361	1373
1	6	219	226
4	15	1580	

Cars	Trucks	Heavys	Totals
1806	12	3	1821

Comments

Accu-Traffic Inc.

Total Count Diagram

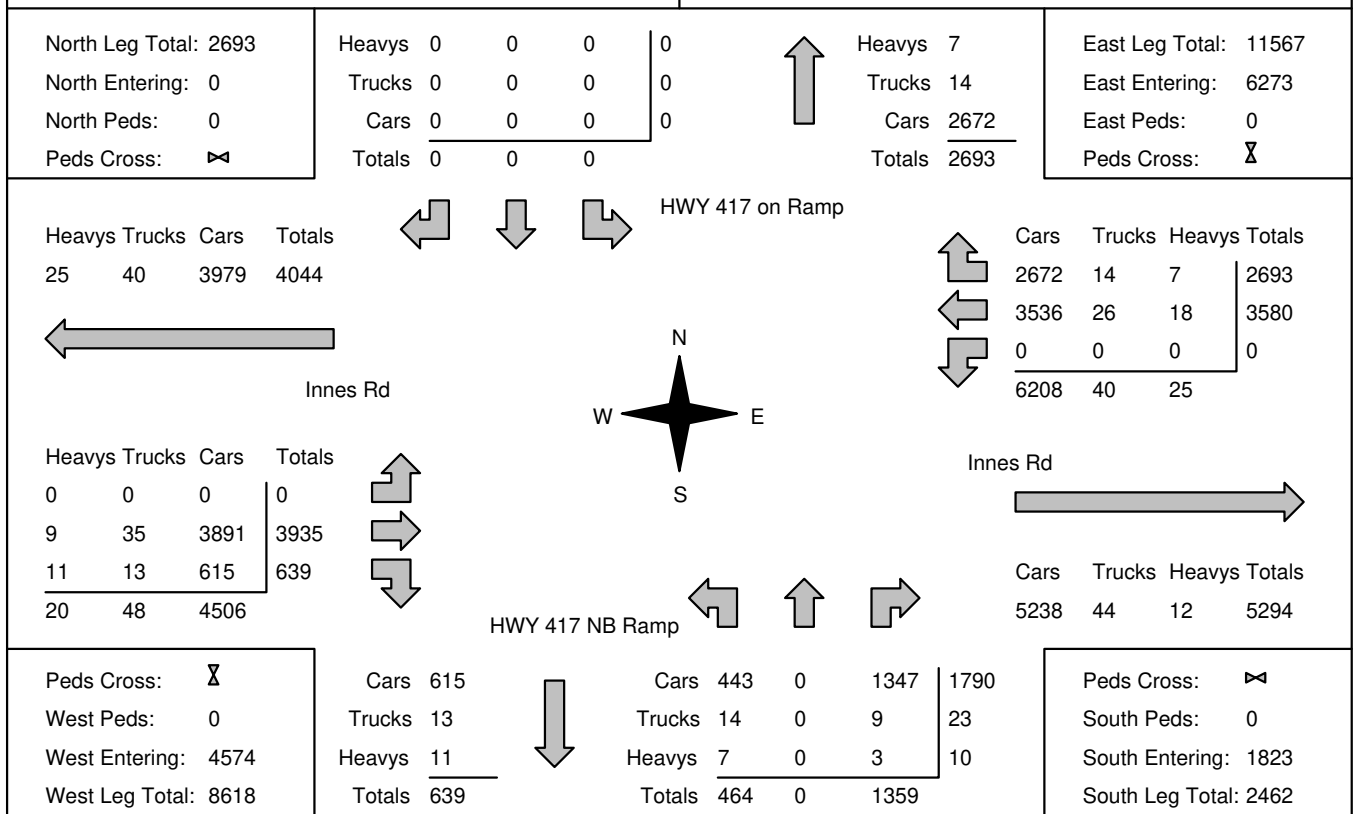
Municipality: Ottawa
Site #: 2509300006
Intersection: Innes Rd & HWY 417 NB Ramp
TFR File #: 1
Count date: 14-Jun-25

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Innes Rd runs W/E



Comments

Accu-Traffic Inc.

Traffic Count Summary

Intersection: Innes Rd & HWY 417 NB Ramp						Count Date: 14-Jun-25		Municipality: Ottawa				
North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
11:00:00	0	0	0	0	0	0	11:00:00	0	0	0	0	0
12:00:00	0	0	0	0	0	627	12:00:00	158	0	469	627	0
13:00:00	0	0	0	0	0	590	13:00:00	157	0	433	590	0
14:00:00	0	0	0	0	0	606	14:00:00	149	0	457	606	0

[illegible]

[illegible]

Accu-Traffic Inc.

Count Date: 14-Jun-25 Site #: 2509300006

[illegible]

Accu-Traffic Inc.

Mid-day Peak Diagram

Specified Period

From: 11:00:00

To: 14:00:00

One Hour Peak

From: 13:00:00

To: 14:00:00

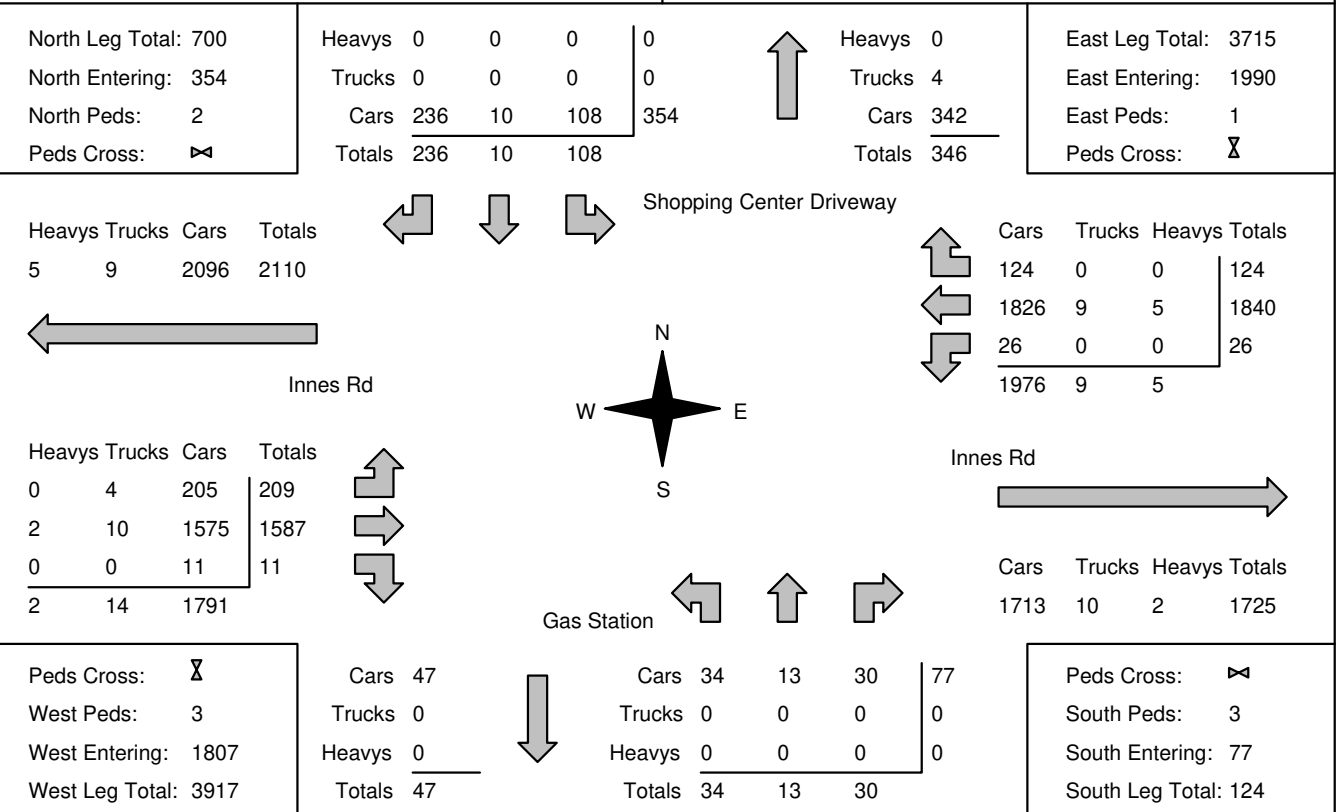
Municipality: Ottawa
Site #: 2509300007
Intersection: Innes Rd & Shopping Center Drive
TFR File #: 1
Count date: 14-Jun-25

Weather conditions:

Person counted:
Person prepared:
Person checked:

** Signalized Intersection **

Major Road: Innes Rd runs W/E



Comments

Accu-Traffic Inc.

Total Count Diagram

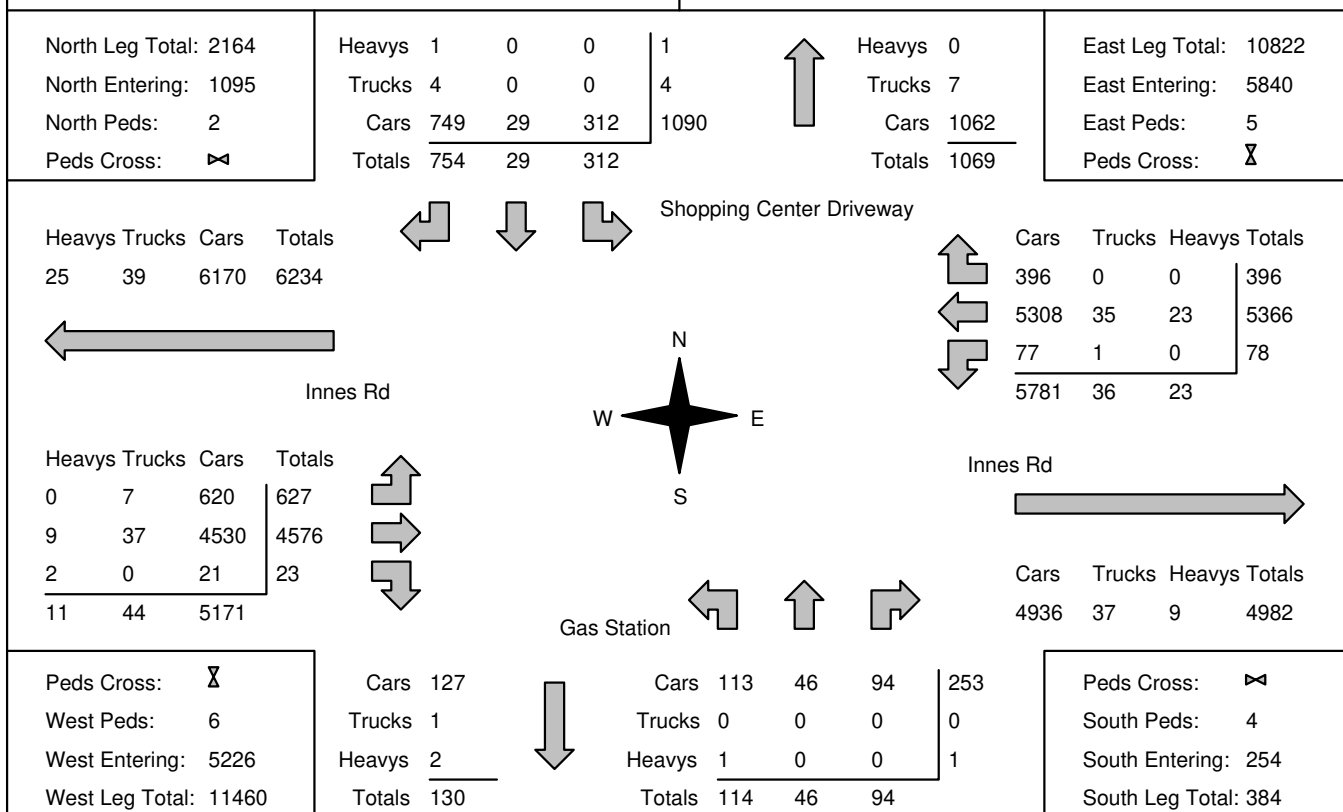
Municipality: Ottawa
Site #: 2509300007
Intersection: Innes Rd & Shopping Center Drive
TFR File #: 1
Count date: 14-Jun-25

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Innes Rd runs W/E



Comments

Accu-Traffic Inc.

Traffic Count Summary

Intersection: Innes Rd & Shopping Center Drive						Count Date: 14-Jun-25		Municipality: Ottawa				
North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
11:00:00	0	0	0	0	0	0	11:00:00	0	0	0	0	0
12:00:00	98	10	247	355	0	445	12:00:00	40	14	36	90	1
13:00:00	106	9	271	386	0	473	13:00:00	40	19	28	87	0
14:00:00	108	10	236	354	2	431	14:00:00	34	13	30	77	3

[illegible]

[illegible]

[illegible]

Accu-Traffic Inc.

Count Date: 14-Jun-25 Site #: 2509300007

[illegible]

Accu-Traffic Inc.

Mid-day Peak Diagram		Specified Period From: 11:00:00 To: 14:00:00	One Hour Peak From: 13:00:00 To: 14:00:00
Municipality: Ottawa Site #: 2509300001 Intersection: Innes Rd & Cyrville Rd TFR File #: 1 Count date: 14-Jun-25		Weather conditions: Person counted: Person prepared: Person checked:	
** Signalized Intersection **		Major Road: Innes Rd runs W/E	

North Leg Total: 886 North Entering: 455 North Peds: 5 Peds Cross:	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: right;">Heavys</td> <td style="text-align: right;">2</td> <td style="text-align: right;">1</td> <td style="text-align: right;">3</td> <td style="border-left: 1px solid black; text-align: right;">6</td> </tr> <tr> <td style="text-align: right;">Trucks</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="border-left: 1px solid black; text-align: right;">0</td> </tr> <tr> <td style="text-align: right;">Cars</td> <td style="text-align: right;">163</td> <td style="text-align: right;">68</td> <td style="text-align: right;">218</td> <td style="border-left: 1px solid black; text-align: right;">449</td> </tr> <tr> <td style="text-align: right;">Totals</td> <td style="text-align: right;">165</td> <td style="text-align: right;">69</td> <td style="text-align: right;">221</td> <td style="border-left: 1px solid black;"></td> </tr> </table>	Heavys	2	1	3	6	Trucks	0	0	0	0	Cars	163	68	218	449	Totals	165	69	221		<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: right;">Heavys</td> <td style="text-align: right;">2</td> </tr> <tr> <td style="text-align: right;">Trucks</td> <td style="text-align: right;">3</td> </tr> <tr> <td style="text-align: right;">Cars</td> <td style="text-align: right;">426</td> </tr> <tr> <td style="text-align: right;">Totals</td> <td style="text-align: right;">431</td> </tr> </table>	Heavys	2	Trucks	3	Cars	426	Totals	431	East Leg Total: 3546 East Entering: 1904 East Peds: 9 Peds Cross:
Heavys	2	1	3	6																											
Trucks	0	0	0	0																											
Cars	163	68	218	449																											
Totals	165	69	221																												
Heavys	2																														
Trucks	3																														
Cars	426																														
Totals	431																														

Heavys	Trucks	Cars	Totals
5	10	1982	1997

Innes Rd

Cyrville Rd

Cars	Trucks	Heavys	Totals
241	3	2	246
1474	6	3	1483
175	0	0	175
1890	9	5	

Heavys	Trucks	Cars	Totals
0	0	97	97
2	7	1237	1246
0	4	361	365
2	11	1695	

N
S
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W

Innes Rd

Cyrville Rd

Peds Cross: West Peds: 2 West Entering: 1708 West Leg Total: 3705	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: right;">Cars</td> <td style="text-align: right;">604</td> </tr> <tr> <td style="text-align: right;">Trucks</td> <td style="text-align: right;">4</td> </tr> <tr> <td style="text-align: right;">Heavys</td> <td style="text-align: right;">1</td> </tr> <tr> <td style="text-align: right;">Totals</td> <td style="text-align: right;">609</td> </tr> </table>	Cars	604	Trucks	4	Heavys	1	Totals	609	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: right;">Cars</td> <td style="text-align: right;">345</td> <td style="text-align: right;">88</td> <td style="text-align: right;">174</td> <td style="border-left: 1px solid black; text-align: right;">607</td> </tr> <tr> <td style="text-align: right;">Trucks</td> <td style="text-align: right;">4</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="border-left: 1px solid black; text-align: right;">4</td> </tr> <tr> <td style="text-align: right;">Heavys</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">1</td> <td style="border-left: 1px solid black; text-align: right;">1</td> </tr> <tr> <td style="text-align: right;">Totals</td> <td style="text-align: right;">349</td> <td style="text-align: right;">88</td> <td style="text-align: right;">175</td> <td style="border-left: 1px solid black;"></td> </tr> </table>	Cars	345	88	174	607	Trucks	4	0	0	4	Heavys	0	0	1	1	Totals	349	88	175		Peds Cross: South Peds: 7 South Entering: 612 South Leg Total: 1221
Cars	604																														
Trucks	4																														
Heavys	1																														
Totals	609																														
Cars	345	88	174	607																											
Trucks	4	0	0	4																											
Heavys	0	0	1	1																											
Totals	349	88	175																												

Comments

Accu-Traffic Inc.

Total Count Diagram

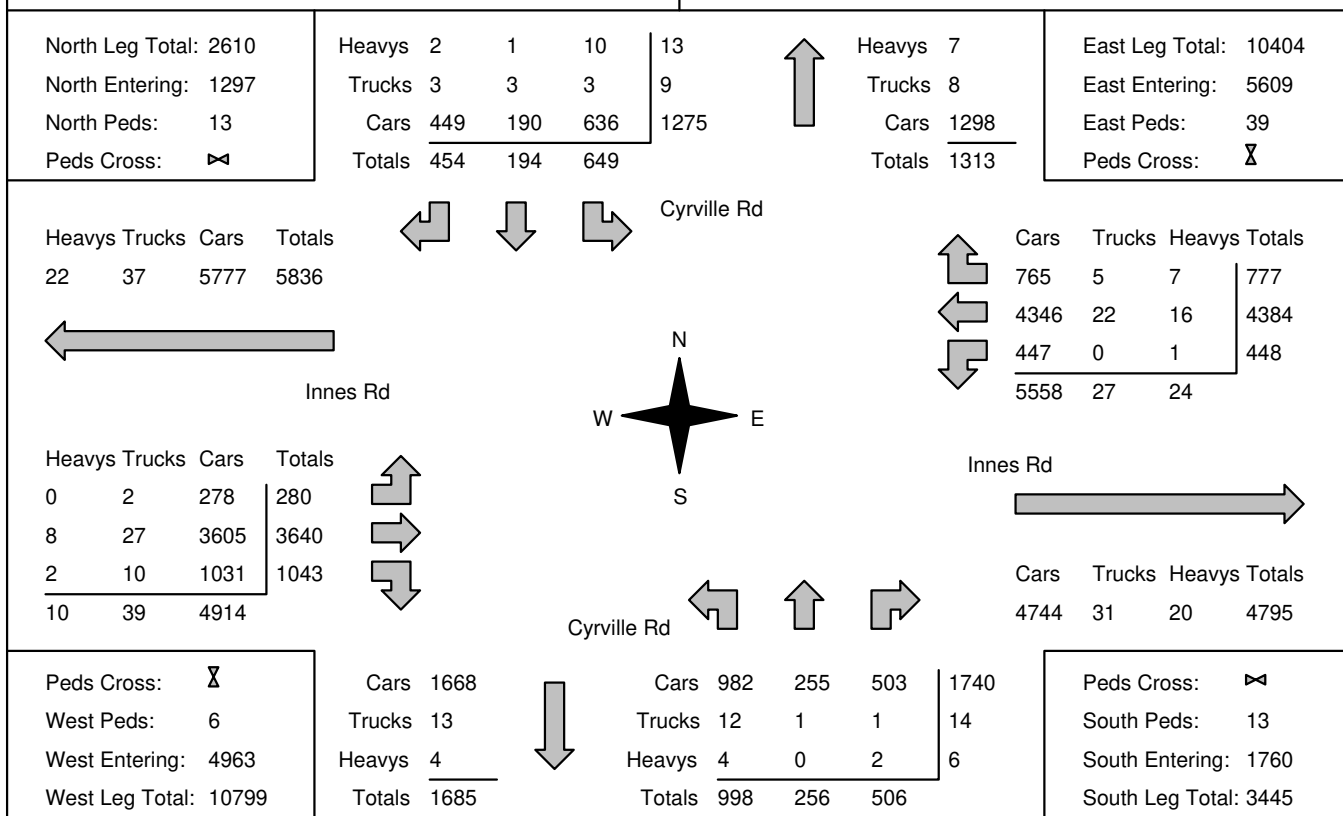
Municipality: Ottawa
Site #: 2509300001
Intersection: Innes Rd & Cyrville Rd
TFR File #: 1
Count date: 14-Jun-25

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Innes Rd runs W/E



Comments

Accu-Traffic Inc.

Traffic Count Summary

Intersection: Innes Rd & Cyrville Rd						Count Date: 14-Jun-25		Municipality: Ottawa				
North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
11:00:00	0	0	0	0	0	0	11:00:00	0	0	0	0	0
12:00:00	210	58	133	401	7	958	12:00:00	313	89	155	557	5
13:00:00	218	67	156	441	1	1032	13:00:00	336	79	176	591	1
14:00:00	221	69	165	455	5	1067	14:00:00	349	88	175	612	7

[illegible]

[illegible]

Accu-Traffic Inc.

Count Date: 14-Jun-25 Site #: 2509300001

[illegible]

[illegible]

Accu-Traffic Inc.

Mid-day Peak Diagram

Specified Period

From: 11:00:00

To: 14:00:00

One Hour Peak

From: 12:45:00

To: 13:45:00

Municipality: Ottawa

Site #: 2509300008

Intersection: Innes Rd & Stonehenge Cres W

TFR File #: 1

Count date: 14-Jun-25

Weather conditions:

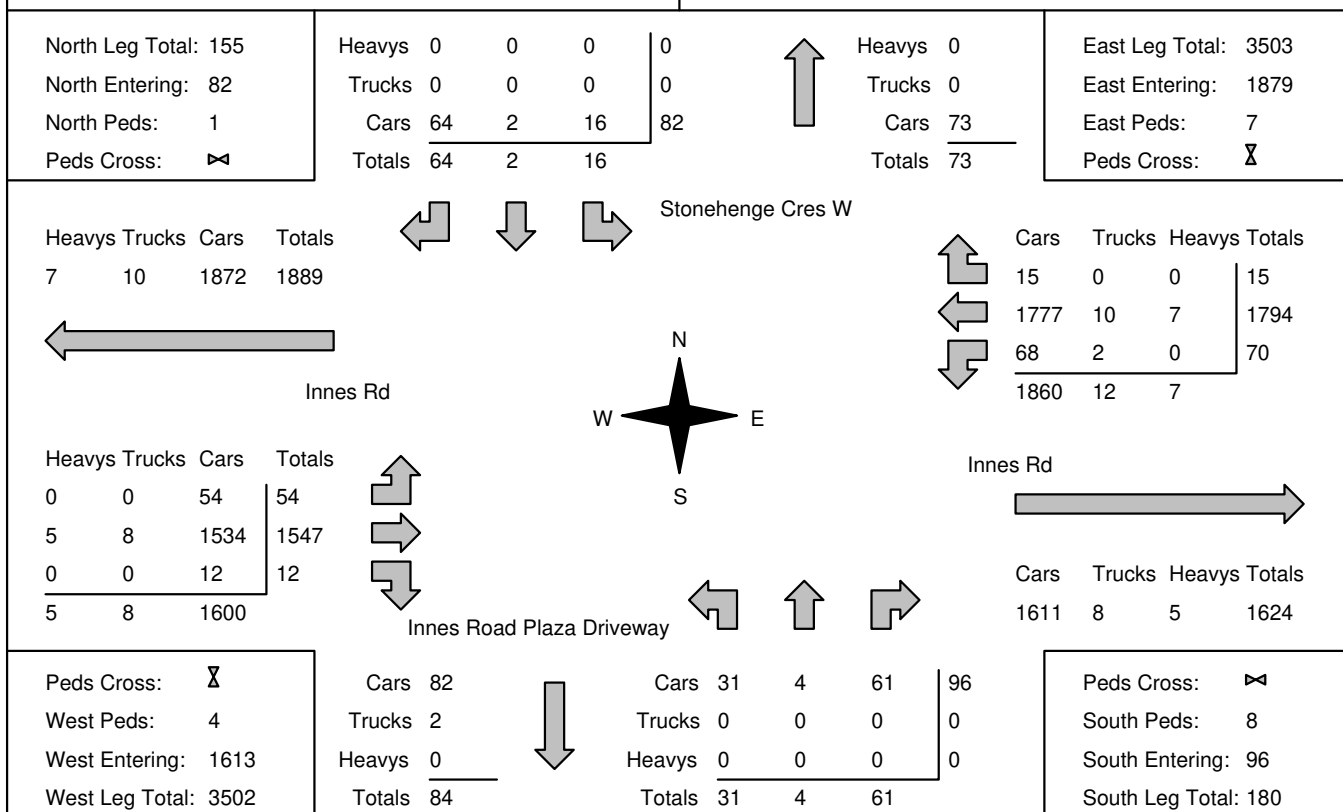
Person counted:

Person prepared:

Person checked:

** Signalized Intersection **

Major Road: Innes Rd runs W/E



Comments

Accu-Traffic Inc.

Total Count Diagram

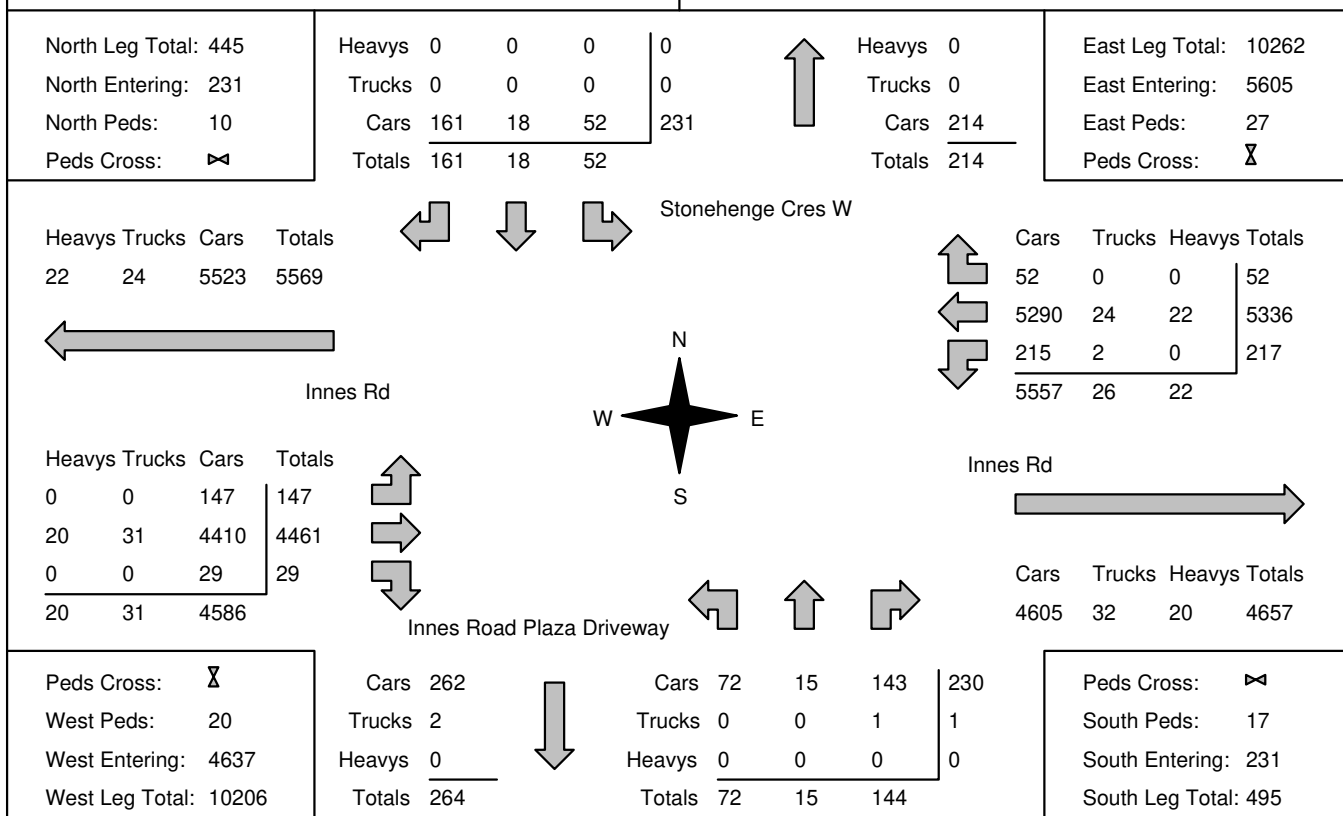
Municipality: Ottawa
Site #: 2509300008
Intersection: Innes Rd & Stonehenge Cres W
TFR File #: 1
Count date: 14-Jun-25

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Innes Rd runs W/E



Comments

Accu-Traffic Inc.

Traffic Count Summary

Intersection: Innes Rd & Stonehenge Cres W					Count Date: 14-Jun-25			Municipality: Ottawa				
North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
11:00:00	0	0	0	0	0	0	11:00:00	0	0	0	0	0
12:00:00	17	9	46	72	7	145	12:00:00	22	6	45	73	5
13:00:00	11	6	52	69	1	143	13:00:00	21	5	48	74	9
14:00:00	24	3	63	90	2	174	14:00:00	29	4	51	84	3

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Accu-Traffic Inc.

Mid-day Peak Diagram

Specified Period

From: 11:00:00

To: 14:00:00

One Hour Peak

From: 13:00:00

To: 14:00:00

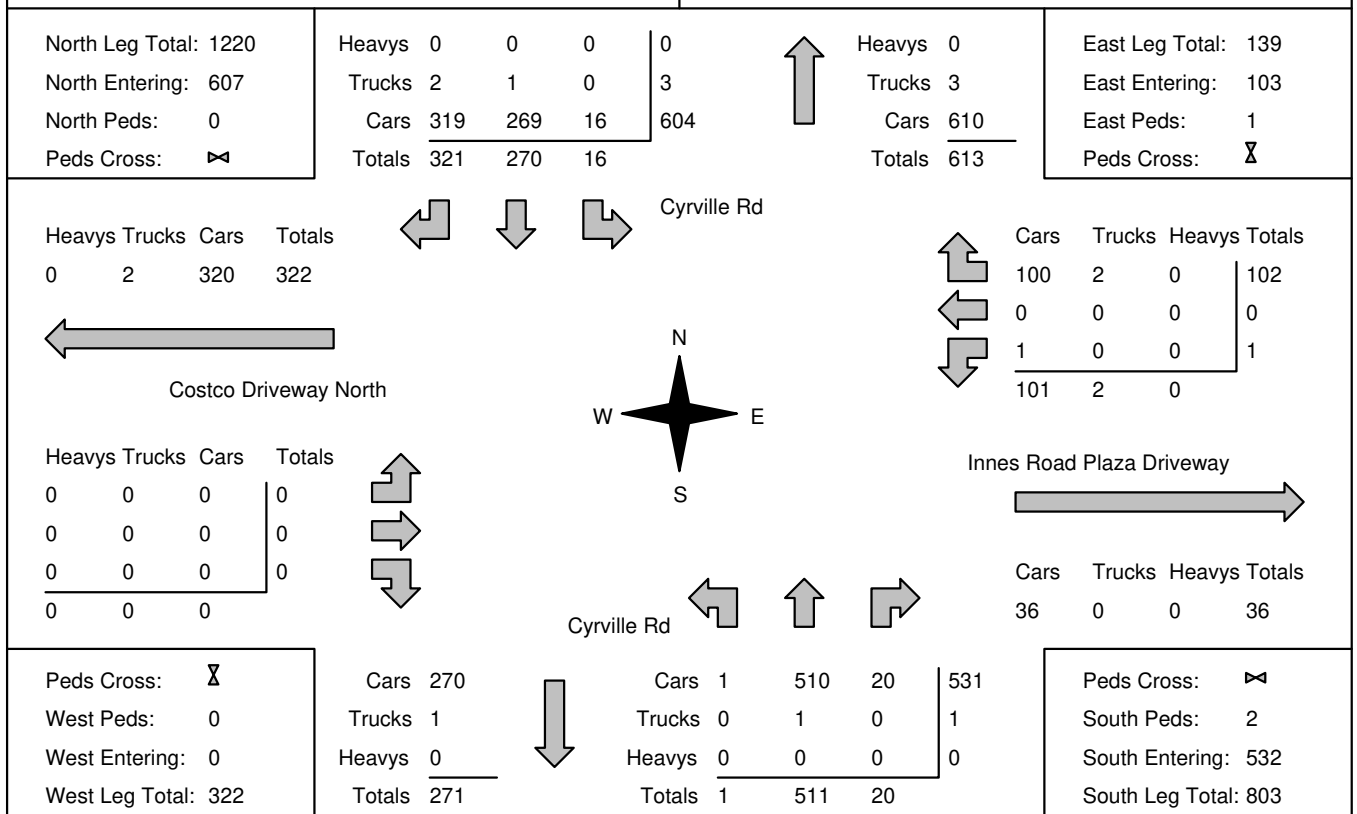
Municipality: Ottawa
Site #: 2509300002
Intersection: Cyrville Rd & Costco Driveway Nort
TFR File #: 1
Count date: 14-Jun-25

Weather conditions:

Person counted:
Person prepared:
Person checked:

** Non-Signalized Intersection **

Major Road: Cyrville Rd runs N/S



Comments

Accu-Traffic Inc.

Total Count Diagram

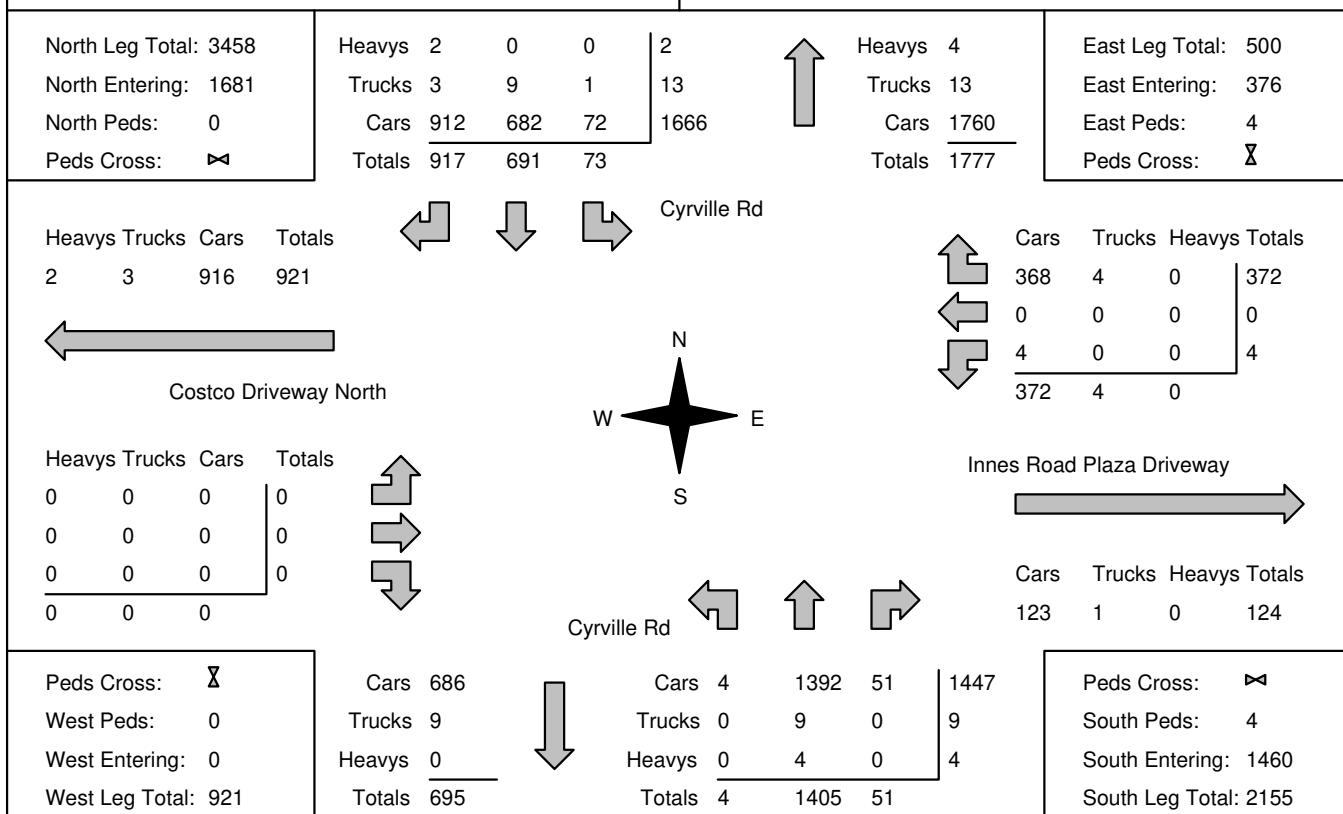
Municipality: Ottawa
Site #: 2509300002
Intersection: Cyrville Rd & Costco Driveway Nort
TFR File #: 1
Count date: 14-Jun-25

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Cyrville Rd runs N/S



Comments

Accu-Traffic Inc.

Traffic Count Summary

Intersection: Cyrville Rd & Costco Driveway No					Count Date: 14-Jun-25			Municipality: Ottawa				
North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
11:00:00	0	0	0	0	0	0	11:00:00	0	0	0	0	0
12:00:00	22	205	306	533	0	1001	12:00:00	2	445	21	468	2
13:00:00	35	216	290	541	0	1001	13:00:00	1	449	10	460	0
14:00:00	16	270	321	607	0	1139	14:00:00	1	511	20	532	2

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Accu-Traffic Inc.

Mid-day Peak Diagram	Specified Period From: 11:00:00 To: 14:00:00	One Hour Peak From: 13:00:00 To: 14:00:00
Municipality: Ottawa Site #: 2509300003 Intersection: Cyrville Rd & Costco Driveway Mid TFR File #: 1 Count date: 14-Jun-25	Weather conditions: Person counted: Person prepared: Person checked:	
** Non-Signalized Intersection **		Major Road: Cyrville Rd runs N/S

North Leg Total: 762 North Entering: 222 North Peds: 0 Peds Cross:	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: right;">Heavys</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> </tr> <tr> <td style="text-align: right;">Trucks</td> <td style="text-align: right;">0</td> <td style="text-align: right;">2</td> <td style="text-align: right;">0</td> <td style="text-align: right;">2</td> </tr> <tr> <td style="text-align: right;">Cars</td> <td style="text-align: right;">124</td> <td style="text-align: right;">22</td> <td style="text-align: right;">74</td> <td style="text-align: right;">220</td> </tr> <tr> <td style="text-align: right;">Totals</td> <td style="text-align: right;">124</td> <td style="text-align: right;">24</td> <td style="text-align: right;">74</td> <td></td> </tr> </table>	Heavys	0	0	0	0	Trucks	0	2	0	2	Cars	124	22	74	220	Totals	124	24	74		<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: right;">Heavys</td> <td style="text-align: right;">0</td> </tr> <tr> <td style="text-align: right;">Trucks</td> <td style="text-align: right;">3</td> </tr> <tr> <td style="text-align: right;">Cars</td> <td style="text-align: right;">537</td> </tr> <tr> <td style="text-align: right;">Totals</td> <td style="text-align: right;">540</td> </tr> </table>	Heavys	0	Trucks	3	Cars	537	Totals	540	East Leg Total: 168 East Entering: 86 East Peds: 1 Peds Cross:
Heavys	0	0	0	0																											
Trucks	0	2	0	2																											
Cars	124	22	74	220																											
Totals	124	24	74																												
Heavys	0																														
Trucks	3																														
Cars	537																														
Totals	540																														

Heavys	0	Trucks	0	Cars	129	Totals	129

Costco Driveway Middle

Cyrville Rd

N
S
W
E

Cyrville Rd

Cars	82	Trucks	0	Heavys	0	Totals	82
Cars	4	Trucks	0	Heavys	0	Totals	4
Cars	0	Trucks	0	Heavys	0	Totals	0
Cars	86	Trucks	0	Heavys	0	Totals	

Dufresne Driveway

Heavys	0	Trucks	2	Cars	448	Totals	450
Heavys	0	Trucks	0	Cars	6	Totals	6
Heavys	0	Trucks	0	Cars	0	Totals	0
Heavys	0	Trucks	2	Cars	454	Totals	

Cyrville Rd

Cars	22	Trucks	2	Heavys	0	Totals	24
Cars	1	Trucks	0	Heavys	0	Totals	1
Cars	7	Trucks	1	Heavys	0	Totals	8
Cars	2	Trucks	0	Heavys	0	Totals	2
Cars	10	Trucks	1	Heavys	0	Totals	

Peds Cross: West Peds: 0 West Entering: 456 West Leg Total: 585	Peds Cross: South Peds: 0 South Entering: 11 South Leg Total: 35

Comments

Accu-Traffic Inc.

Total Count Diagram

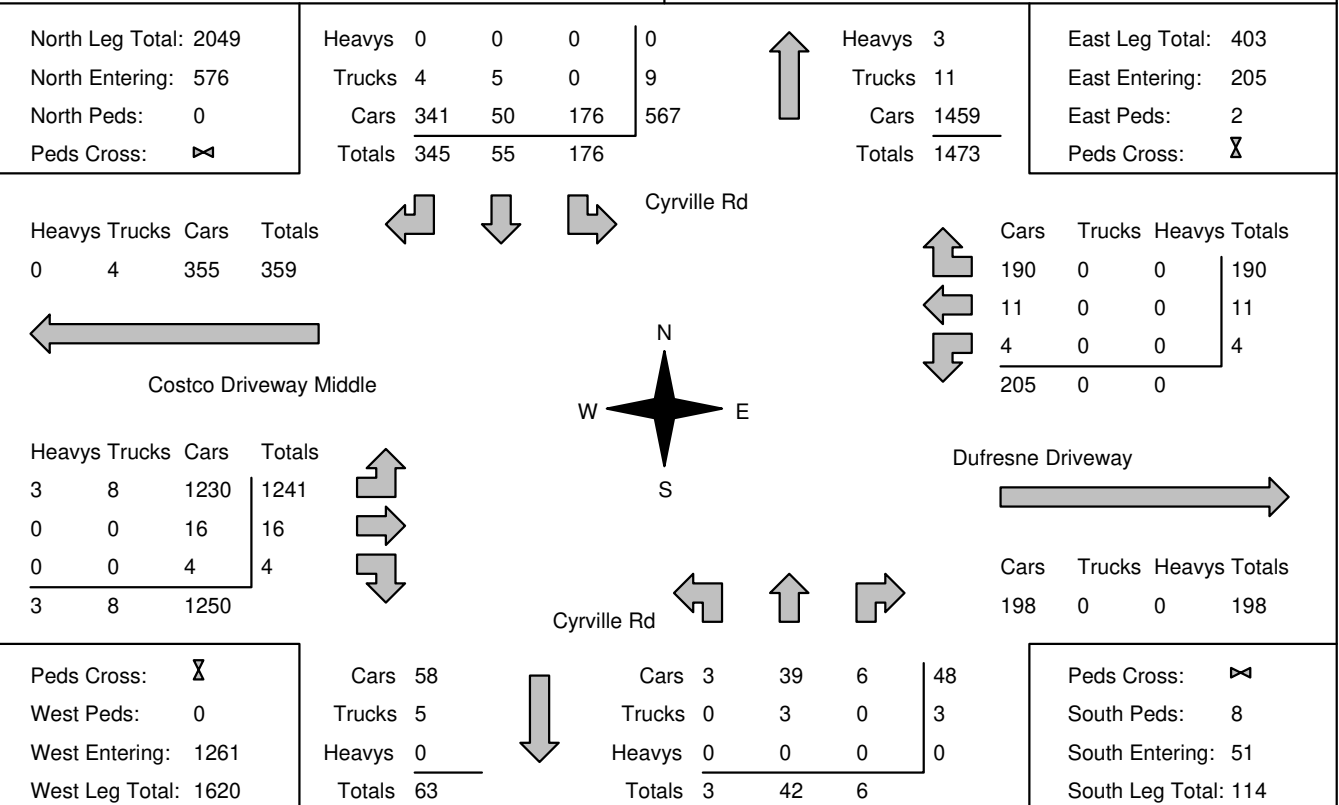
Municipality: Ottawa
Site #: 2509300003
Intersection: Cyrville Rd & Costco Driveway Mid
TFR File #: 1
Count date: 14-Jun-25

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: Cyrville Rd runs N/S



Comments

Accu-Traffic Inc.

Traffic Count Summary

Intersection: Cyrville Rd & Costco Driveway Mi					Count Date: 14-Jun-25		Municipality: Ottawa					
North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
11:00:00	0	0	0	0	0	0	11:00:00	0	0	0	0	0
12:00:00	54	21	105	180	0	201	12:00:00	1	19	1	21	2
13:00:00	48	10	116	174	0	193	13:00:00	1	15	3	19	6
14:00:00	74	24	124	222	0	233	14:00:00	1	8	2	11	0

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Appendix C

Crash Data



Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: BLAIR RD @ INNES RD

Traffic Control: Traffic signal

Total Collisions: 107

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2018-Jan-06, Sat,19:31	Freezing Rain	Rear end	P.D. only	Ice	East	Slowing or stopping	Passenger van	Skidding/sliding	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jan-13, Sat,16:16	Clear	Rear end	Non-fatal injury	Wet	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Feb-05, Mon,17:12	Clear	Sideswipe	P.D. only	Slush	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Feb-06, Tue,08:55	Snow	Rear end	P.D. only	Loose snow	South	Turning right	Automobile, station wagon	Other motor vehicle	0
					South	Turning right	Pick-up truck	Other motor vehicle	
2018-Feb-21, Wed,14:16	Clear	Sideswipe	P.D. only	Wet	East	Going ahead	Passenger van	Other motor vehicle	0
					East	Going ahead	Truck - car carrier	Other motor vehicle	
2018-Mar-09, Fri,09:22	Snow	Turning movement	P.D. only	Loose snow	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Turning left	Pick-up truck	Other motor vehicle	
2018-Apr-25, Wed,15:02	Rain	Rear end	P.D. only	Wet	East	Slowing or stopping	Passenger van	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2018-May-23, Wed,17:00	Clear	Sideswipe	P.D. only	Dry	East	Turning left	Unknown	Other motor vehicle	0
					East	Turning left	Automobile, station wagon	Other motor vehicle	
2018-Jun-02, Sat,20:18	Clear	Rear end	P.D. only	Dry	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jun-07, Thu,08:15	Clear	Rear end	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle	0
					East	Stopped	Pick-up truck	Other motor vehicle	
2018-Jun-08, Fri,11:55	Clear	Rear end	P.D. only	Dry	East	Going ahead	Truck - tractor	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	



Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: BLAIR RD @ INNES RD

Traffic Control: Traffic signal

Total Collisions: 107

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2018-Jun-18, Mon,10:29	Rain	Rear end	P.D. only	Wet	West	Slowing or stopping	Automobile, station wagon	Skidding/sliding	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jul-17, Tue,19:40	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jul-20, Fri,19:50	Clear	Angle	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Aug-09, Thu,19:15	Clear	Rear end	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle	0
					South	Turning right	Automobile, station wagon	Other motor vehicle	
2018-Aug-18, Sat,17:55	Clear	Sideswipe	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Turning left	Automobile, station wagon	Other motor vehicle	
2018-Sep-25, Tue,13:15	Rain	Sideswipe	Non-fatal injury	Wet	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Pick-up truck	Other motor vehicle	
2018-Oct-04, Thu,18:38	Clear	Rear end	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2018-Oct-18, Thu,10:52	Clear	Rear end	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle	0
					South	Turning right	Automobile, station wagon	Other motor vehicle	
2018-Oct-22, Mon,07:02	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Oct-23, Tue,16:40	Clear	Rear end	P.D. only	Dry	South	Unknown	Unknown	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	



Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: BLAIR RD @ INNES RD

Traffic Control: Traffic signal

Total Collisions: 107

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2018-Oct-27, Sat,18:30	Rain	Rear end	P.D. only	Wet	South	Turning right	Pick-up truck	Other motor vehicle	0
					South	Turning right	Automobile, station wagon	Other motor vehicle	
2018-Nov-09, Fri,18:30	Snow	Rear end	P.D. only	Slush	South	Going ahead	Unknown	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Dec-01, Sat,17:15	Clear	Sideswipe	P.D. only	Dry	West	Unknown	Automobile, station wagon	Other motor vehicle	0
					West	Unknown	Automobile, station wagon	Other motor vehicle	
2018-Dec-18, Tue,07:15	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Passenger van	Other motor vehicle	
2018-Dec-31, Mon,08:24	Clear	Angle	P.D. only	Ice	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2019-Jan-13, Sun,17:10	Clear	Rear end	Non-fatal injury	Dry	West	Going ahead	Pick-up truck	Other motor vehicle	0
					West	Stopped	Pick-up truck	Other motor vehicle	
2019-Jan-23, Wed,15:40	Snow	Rear end	P.D. only	Loose snow	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2019-Feb-01, Fri,10:12	Clear	Rear end	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Turning left	Automobile, station wagon	Other motor vehicle	
2019-Mar-21, Thu,14:22	Clear	Rear end	P.D. only	Dry	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Apr-25, Thu,14:15	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-May-07, Tue,11:41	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Stopped	Automobile, station wagon	Other motor vehicle	



Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: BLAIR RD @ INNES RD

Traffic Control: Traffic signal

Total Collisions: 107

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2019-May-07, Tue,16:40	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Jun-22, Sat,17:59	Clear	Angle	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Jun-24, Mon,17:30	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Unknown	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Jul-23, Tue,13:30	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Passenger van	Other motor vehicle	
2019-Aug-02, Fri,18:14	Clear	Sideswipe	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Aug-22, Thu,06:31	Clear	SMV other	P.D. only	Dry	East	Turning left	Truck and trailer	Pole (sign, parking meter)	0
2019-Aug-29, Thu,13:15	Clear	Sideswipe	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle	0
					East	Stopped	Delivery van	Other motor vehicle	
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Oct-22, Tue,22:40	Rain	Rear end	P.D. only	Wet	South	Turning right	Automobile, station wagon	Other motor vehicle	0
					South	Turning right	Automobile, station wagon	Other motor vehicle	
2019-Nov-02, Sat,15:38	Rain	Angle	P.D. only	Wet	East	Going ahead	Pick-up truck	Other motor vehicle	0
					South	Turning left	Pick-up truck	Other motor vehicle	
2019-Nov-07, Thu,17:30	Clear	Rear end	Non-fatal injury	Dry	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Passenger van	Other motor vehicle	
2019-Nov-21, Thu,12:07	Clear	Rear end	Non-fatal injury	Wet	South	Turning right	Automobile, station wagon	Other motor vehicle	0
					South	Turning right	Automobile, station wagon	Other motor vehicle	



Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: BLAIR RD @ INNES RD

Traffic Control: Traffic signal

Total Collisions: 107

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2019-Dec-04, Wed,10:28	Snow	Rear end	P.D. only	Loose snow	West	Slowing or stopping	Automobile, station wagon	Skidding/sliding	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Dec-14, Sat,16:00	Rain	Rear end	P.D. only	Wet	South	Turning right	Passenger van	Other motor vehicle	0
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2019-Dec-23, Mon,15:10	Clear	Rear end	P.D. only	Wet	South	Turning right	Pick-up truck	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2020-Jan-20, Mon,15:00	Clear	Angle	P.D. only	Dry	South	Unknown	Passenger van	Other motor vehicle	0
					East	Unknown	Automobile, station wagon	Other motor vehicle	
2020-Feb-03, Mon,08:41	Clear	Sideswipe	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	0
					South	Turning left	Truck and trailer	Other motor vehicle	
2020-Feb-05, Wed,11:35	Clear	Rear end	P.D. only	Dry	South	Turning right	Pick-up truck	Other motor vehicle	0
					South	Turning right	Automobile, station wagon	Other motor vehicle	
2020-Feb-11, Tue,21:53	Clear	SMV other	P.D. only	Wet	West	Turning right	Automobile, station wagon	Pole (utility, power)	0
2020-Feb-27, Thu,07:45	Snow	Rear end	P.D. only	Slush	East	Unknown	Unknown	Other motor vehicle	0
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2020-Mar-27, Fri,18:00	Clear	Rear end	P.D. only	Dry	East	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					East	Stopped	Pick-up truck	Other motor vehicle	
2020-Jun-01, Mon,22:14	Clear	Sideswipe	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle	0
					East	Other	Police vehicle	Other motor vehicle	
2020-Jul-27, Mon,11:33	Clear	Rear end	P.D. only	Dry	South	Turning right	Passenger van	Other motor vehicle	0
					South	Turning right	Automobile, station wagon	Other motor vehicle	
2020-Aug-06, Thu,21:50	Clear	Sideswipe	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					East	Turning left	Automobile, station wagon	Other motor vehicle	



Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: BLAIR RD @ INNES RD

Traffic Control: Traffic signal

Total Collisions: 107

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2020-Aug-25, Tue,14:47	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Pick-up truck	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2020-Sep-11, Fri,10:20	Clear	Rear end	P.D. only	Dry	South	Turning right	Unknown	Other motor vehicle	0
					South	Turning right	Pick-up truck	Other motor vehicle	
					South	Turning right	Automobile, station wagon	Other motor vehicle	
2020-Sep-23, Wed,16:15	Clear	Rear end	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Turning left	Automobile, station wagon	Other motor vehicle	
					East	Turning left	Automobile, station wagon	Other motor vehicle	
					East	Turning left	Automobile, station wagon	Other motor vehicle	
					East	Turning left	Pick-up truck	Other motor vehicle	
2020-Sep-27, Sun,19:31	Clear	Turning movement	P.D. only	Dry	East	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Pick-up truck	Other motor vehicle	
2020-Oct-05, Mon,06:20	Rain	Angle	P.D. only	Wet	South	Turning right	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2020-Oct-24, Sat,21:40	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Pick-up truck	Other motor vehicle	
2020-Dec-02, Wed,10:37	Clear	Rear end	Non-fatal injury	Wet	West	Going ahead	Pick-up truck	Other motor vehicle	0
					West	Stopped	Pick-up truck	Other motor vehicle	
2020-Dec-18, Fri,19:25	Clear	Rear end	P.D. only	Dry	East	Turning left	Pick-up truck	Other motor vehicle	0
					East	Turning left	Pick-up truck	Other motor vehicle	
2020-Dec-29, Tue,16:14	Clear	Rear end	Non-fatal injury	Dry	West	Slowing or stopping	Truck - dump	Other motor vehicle	0
					West	Stopped	Pick-up truck	Other motor vehicle	
					West	Stopped	Pick-up truck	Other motor vehicle	



Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: BLAIR RD @ INNES RD

Traffic Control: Traffic signal

Total Collisions: 107

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2021-Jan-13, Wed,06:50	Clear	Sideswipe	P.D. only	Dry	South	Changing lanes	Pick-up truck	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2021-Mar-09, Tue,07:39	Clear	Rear end	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle	0
					South	Turning right	Pick-up truck	Other motor vehicle	
2021-Apr-26, Mon,16:00	Clear	Rear end	P.D. only	Dry	South	Turning left	Pick-up truck	Other motor vehicle	0
					South	Turning left	Pick-up truck	Other motor vehicle	
2021-Jun-14, Mon,11:53	Clear	Sideswipe	P.D. only	Dry	West	Unknown	Unknown	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2021-Jun-21, Mon,10:19	Clear	Sideswipe	P.D. only	Wet	East	Changing lanes	Pick-up truck	Other motor vehicle	0
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2021-Jul-04, Sun,17:14	Clear	Rear end	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2021-Jul-28, Wed,13:00	Clear	Rear end	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2021-Aug-19, Thu,23:30	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Pick-up truck	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2021-Aug-28, Sat,21:08	Rain	Turning movement	P.D. only	Wet	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Turning left	Automobile, station wagon	Other motor vehicle	
2021-Oct-04, Mon,20:40	Clear	Turning movement	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	0
					South	Turning left	Passenger van	Other motor vehicle	
2021-Nov-14, Sun,10:50	Clear	Rear end	P.D. only	Dry	West	Going ahead	Pick-up truck	Other motor vehicle	0
					West	Stopped	Pick-up truck	Other motor vehicle	
2021-Nov-28, Sun,16:20	Clear	Rear end	P.D. only	Dry	East	Unknown	Unknown	Other motor vehicle	0
					East	Stopped	Passenger van	Other motor vehicle	



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From: January 1, 2018 **To:** December 31, 2022

Location: BLAIR RD @ INNES RD

Traffic Control: Traffic signal

Total Collisions: 107

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2021-Dec-07, Tue,17:00	Clear	Rear end	P.D. only	Ice	South	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2021-Dec-13, Mon,16:04	Clear	Rear end	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					West	Slowing or stopping	Pick-up truck	Other motor vehicle	
2022-Feb-15, Tue,09:25	Clear	Rear end	P.D. only	Dry	West	Unknown	Unknown	Other motor vehicle	0
					West	Stopped	Pick-up truck	Other motor vehicle	
2022-Feb-18, Fri,08:05	Clear	Rear end	P.D. only	Loose snow	West	Unknown	Pick-up truck	Other motor vehicle	0
					West	Stopped	Pick-up truck	Other motor vehicle	
2022-Mar-01, Tue,13:50	Snow	Sideswipe	P.D. only	Packed snow	East	Unknown	Truck - open	Other motor vehicle	0
					East	Unknown	Pick-up truck	Other motor vehicle	
2022-Mar-18, Fri,23:26	Clear	SMV other	Non-fatal injury	Dry	East	Turning left	Automobile, station wagon	Pedestrian	1
2022-Mar-27, Sun,20:03	Clear	Rear end	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle	0
					East	Stopped	Pick-up truck	Other motor vehicle	
2022-May-12, Thu,08:45	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2022-May-24, Tue,20:00	Clear	Angle	Non-fatal injury	Dry	West	Going ahead	Pick-up truck	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2022-May-26, Thu,07:19	Rain	Angle	P.D. only	Wet	South	Turning left	Pick-up truck	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Pick-up truck	Other motor vehicle	
2022-Jun-14, Tue,08:36	Clear	Sideswipe	Non-fatal injury	Dry	West	Merging	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	



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From: January 1, 2018 **To:** December 31, 2022

Location: BLAIR RD @ INNES RD

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Total Collisions: 107

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2022-Jun-16, Thu,13:58	Clear	SMV other	P.D. only	Dry	East	Pulling onto shoulder or toward curb	Pick-up truck	Curb	0
2022-Jun-26, Sun,13:00	Clear	Rear end	P.D. only	Dry	West West	Slowing or stopping Stopped	Passenger van Delivery van	Other motor vehicle Other motor vehicle	0
2022-Jun-29, Wed,08:52	Clear	Sideswipe	P.D. only	Dry	East East	Turning left Going ahead	Pick-up truck Pick-up truck	Other motor vehicle Other motor vehicle	0
2022-Jul-01, Fri,14:16	Clear	SMV other	P.D. only	Dry	West	Turning right	Pick-up truck	Ran off road	0
2022-Jul-21, Thu,17:15	Clear	Rear end	P.D. only	Dry	East East East	Going ahead Slowing or stopping Stopped	Passenger van Automobile, station wagon Automobile, station wagon	Other motor vehicle Other motor vehicle Other motor vehicle	0
2022-Aug-06, Sat,13:15	Clear	Turning movement	P.D. only	Dry	South South	Turning left Turning left	Automobile, station wagon	Other motor vehicle Other motor vehicle	0
2022-Aug-15, Mon,10:32	Clear	Rear end	Non-fatal injury	Dry	East East	Slowing or stopping Slowing or stopping	Truck - dump Automobile, station wagon	Other motor vehicle Other motor vehicle	0
2022-Aug-19, Fri,14:15	Clear	Rear end	P.D. only	Dry	East East	Going ahead Stopped	Pick-up truck Automobile, station wagon	Other motor vehicle Other motor vehicle	0
2022-Aug-27, Sat,10:35	Clear	Rear end	P.D. only	Dry	West West	Going ahead Stopped	Automobile, station wagon	Other motor vehicle Other motor vehicle	0
2022-Oct-05, Wed,08:50	Clear	Angle	P.D. only	Dry	South West	Turning right Slowing or stopping	Pick-up truck Automobile, station wagon	Other motor vehicle Other motor vehicle	0
2022-Oct-13, Thu,14:49	Rain	Rear end	P.D. only	Wet	East East	Going ahead Stopped	Automobile, station wagon Automobile, station wagon	Other motor vehicle Other motor vehicle	0
2022-Nov-08, Tue,03:30	Clear	Turning movement	P.D. only	Dry	West West	Going ahead Turning right	Automobile, station wagon Automobile, station wagon	Other motor vehicle Other motor vehicle	0



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From: January 1, 2018 **To:** December 31, 2022

Location: BLAIR RD @ INNES RD

Traffic Control: Traffic signal

Total Collisions: 107

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2022-Nov-28, Mon,18:25	Clear	Sideswipe	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Changing lanes	Automobile, station wagon	Other motor vehicle	
2022-Nov-30, Wed,11:30	Rain	Sideswipe	Non-reportable	Wet	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2022-Dec-05, Mon,16:00	Clear	Rear end	P.D. only	Dry	East	Changing lanes	Passenger van	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2022-Dec-08, Thu,17:25	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2022-Dec-14, Wed,15:35	Clear	Rear end	P.D. only	Dry	West	Stopped	Automobile, station wagon	Other motor vehicle	0
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2022-Dec-19, Mon,20:00	Clear	Turning movement	P.D. only	Dry	West	Turning right	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2022-Dec-20, Tue,08:40	Clear	Rear end	P.D. only	Wet	East	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2022-Dec-21, Wed,22:05	Clear	Angle	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Turning right	Automobile, station wagon	Other motor vehicle	

Location: CYRVILLE RD @ INNES RD

Traffic Control: Traffic signal

Total Collisions: 117

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2018-Jan-02, Tue,13:50	Snow	Rear end	P.D. only	Slush	East	Going ahead	Automobile, station wagon	Skidding/sliding	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jan-26, Fri,18:43	Clear	Rear end	P.D. only	Wet	West	Slowing or stopping	Automobile, station wagon	Skidding/sliding	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	



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From: January 1, 2018 **To:** December 31, 2022

Location: CYRVILLE RD @ INNES RD

Traffic Control: Traffic signal

Total Collisions: 117

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2018-Feb-10, Sat,12:45	Clear	Rear end	P.D. only	Wet	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2018-Feb-14, Wed,12:00	Clear	Rear end	P.D. only	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle	0
					East	Turning right	Automobile, station wagon	Other motor vehicle	
2018-Feb-23, Fri,06:42	Clear	Rear end	P.D. only	Loose snow	West	Going ahead	Automobile, station wagon	Skidding/sliding	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Mar-10, Sat,17:28	Clear	Angle	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Apr-26, Thu,12:16	Rain	Sideswipe	P.D. only	Wet	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Pick-up truck	Other motor vehicle	
2018-Apr-29, Sun,12:11	Clear	Angle	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Pick-up truck	Other motor vehicle	
2018-May-12, Sat,12:49	Clear	Rear end	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jun-23, Sat,12:17	Clear	Rear end	P.D. only	Dry	North	Going ahead	Pick-up truck	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jun-30, Sat,15:19	Clear	Sideswipe	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Changing lanes	Pick-up truck	Other motor vehicle	
2018-Jul-10, Tue,07:22	Clear	Rear end	Non-fatal injury	Dry	West	Slowing or stopping	Delivery van	Other motor vehicle	0
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2018-Aug-07, Tue,20:19	Clear	Sideswipe	P.D. only	Dry	East	Going ahead	Truck - car carrier	Other motor vehicle	0
					East	Overtaking	Automobile, station wagon	Other motor vehicle	
2018-Aug-15, Wed,11:13	Clear	Turning movement	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	



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From: January 1, 2018 **To:** December 31, 2022

Location: CYRVILLE RD @ INNES RD

Traffic Control: Traffic signal

Total Collisions: 117

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2018-Aug-16, Thu,16:00	Clear	Angle	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Oct-02, Tue,07:44	Rain	Angle	Non-fatal injury	Wet	West	Going ahead	Pick-up truck	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2018-Oct-02, Tue,14:00	Clear	Angle	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Oct-04, Thu,21:45	Clear	Sideswipe	Non-fatal injury	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Oct-18, Thu,14:10	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Pick-up truck	Other motor vehicle	
2018-Nov-07, Wed,15:57	Clear	Rear end	P.D. only	Wet	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Nov-10, Sat,13:07	Snow	Rear end	P.D. only	Wet	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Nov-29, Thu,06:40	Clear	Rear end	Non-fatal injury	Wet	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Nov-30, Fri,15:10	Clear	Rear end	P.D. only	Dry	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Dec-03, Mon,07:48	Snow	Rear end	P.D. only	Wet	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Slowing or stopping	Unknown	Other motor vehicle	
2018-Dec-11, Tue,16:30	Clear	Sideswipe	P.D. only	Wet	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	



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Location: CYRVILLE RD @ INNES RD

Traffic Control: Traffic signal

Total Collisions: 117

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2018-Dec-28, Fri,09:24	Rain	Rear end	P.D. only	Slush	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
					East	Stopped	Delivery van	Other motor vehicle	
2019-Jan-04, Fri,01:39	Snow	SMV other	Non-fatal injury	Loose snow	East	Turning left	Automobile, station wagon	Skidding/sliding	0
2019-Jan-16, Wed,10:31	Clear	Rear end	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Jan-20, Sun,11:00	Snow	Rear end	P.D. only	Loose snow	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Turning left	Unknown	Other motor vehicle	
2019-Feb-09, Sat,16:06	Clear	Sideswipe	P.D. only	Ice	West	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					West	Turning left	Truck - closed	Other motor vehicle	
2019-Feb-18, Mon,13:22	Clear	Rear end	P.D. only	Wet	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2019-Feb-19, Tue,14:34	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Mar-10, Sun,12:16	Snow	Angle	P.D. only	Ice	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Mar-18, Mon,16:10	Clear	Rear end	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle	0
					South	Turning right	Automobile, station wagon	Other motor vehicle	
2019-Mar-30, Sat,12:30	Clear	Rear end	P.D. only	Wet	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2019-May-06, Mon,13:30	Clear	Rear end	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Pick-up truck	Other motor vehicle	
2019-May-18, Sat,15:19	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	



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Traffic Control: Traffic signal

Total Collisions: 117

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2019-Jun-04, Tue,06:00	Clear	Rear end	Non-fatal injury	Dry	East	Unknown	Unknown	Other motor vehicle	0
					East	Going ahead	Pick-up truck	Other motor vehicle	
2019-Jul-04, Thu,12:25	Clear	Sideswipe	P.D. only	Dry	East	Unknown	Unknown	Other motor vehicle	0
					East	Changing lanes	Automobile, station wagon	Other motor vehicle	
2019-Jul-23, Tue,10:15	Clear	Rear end	P.D. only	Dry	West	Turning right	Pick-up truck	Other motor vehicle	0
					West	Turning right	Passenger van	Other motor vehicle	
2019-Aug-06, Tue,18:41	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Aug-15, Thu,06:58	Clear	Rear end	Non-fatal injury	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2019-Aug-28, Wed,06:58	Rain	Rear end	P.D. only	Wet	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Aug-28, Wed,15:20	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2019-Aug-29, Thu,17:15	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Sep-04, Wed,17:03	Clear	Sideswipe	P.D. only	Dry	East	Unknown	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Sep-21, Sat,23:16	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	



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2019-Sep-23, Mon,06:28	Rain	Rear end	P.D. only	Wet	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Sep-23, Mon,14:50	Clear	Rear end	P.D. only	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle	0
					East	Turning right	Automobile, station wagon	Other motor vehicle	
2019-Sep-24, Tue,08:25	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Nov-28, Thu,11:35	Clear	Other	P.D. only	Wet	East	Reversing	Truck-other	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Dec-12, Thu,16:15	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Pick-up truck	Other motor vehicle	
2019-Dec-13, Fri,17:23	Clear	Rear end	P.D. only	Dry	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Passenger van	Other motor vehicle	
2019-Dec-20, Fri,18:07	Clear	Other	Non-fatal injury	Dry	West	Turning right	Pick-up truck	Curb	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Dec-23, Mon,12:12	Clear	Rear end	P.D. only	Wet	West	Slowing or stopping	Truck - tractor	Skidding/sliding	0
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2019-Dec-24, Tue,11:00	Clear	Angle	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2020-Jan-05, Sun,08:55	Clear	Angle	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2020-Jan-06, Mon,07:10	Snow	Angle	P.D. only	Slush	South	Turning right	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	



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Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2020-Jan-06, Mon,11:30	Snow	Rear end	P.D. only	Loose snow	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2020-Jan-09, Thu,16:30	Clear	Angle	Non-fatal injury	Dry	East	Going ahead	Pick-up truck	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Pick-up truck	Other motor vehicle	
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2020-Jan-31, Fri,07:15	Clear	Rear end	P.D. only	Dry	West	Turning right	Pick-up truck	Other motor vehicle	0
					West	Turning right	Pick-up truck	Other motor vehicle	
2020-Feb-08, Sat,16:00	Clear	Angle	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Pick-up truck	Other motor vehicle	
2020-Feb-16, Sun,10:18	Clear	Rear end	P.D. only	Wet	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Slowing or stopping	Passenger van	Other motor vehicle	
2020-Mar-13, Fri,12:17	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Pick-up truck	Other motor vehicle	0
					East	Going ahead	Pick-up truck	Other motor vehicle	
2020-Mar-23, Mon,16:07	Snow	Rear end	P.D. only	Wet	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Turning left	Automobile, station wagon	Other motor vehicle	
2020-May-12, Tue,14:00	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Truck - closed	Other motor vehicle	
2020-Jun-03, Wed,11:50	Clear	Rear end	P.D. only	Dry	South	Turning right	Automobile, station wagon	Other motor vehicle	0
					South	Turning right	Pick-up truck	Other motor vehicle	
2020-Jun-25, Thu,14:40	Clear	Rear end	P.D. only	Dry	West	Changing lanes	Pick-up truck	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	



Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: CYRVILLE RD @ INNES RD

Traffic Control: Traffic signal

Total Collisions: 117

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2020-Jun-26, Fri,18:10	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2020-Jul-09, Thu,10:52	Clear	Angle	Non-fatal injury	Dry	West	Going ahead	Pick-up truck	Other motor vehicle	0
					South	Going ahead	Delivery van	Other motor vehicle	
2020-Jul-27, Mon,15:03	Clear	Angle	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
					North	Going ahead	Pick-up truck	Other motor vehicle	
2020-Aug-01, Sat,16:40	Clear	Sideswipe	P.D. only	Dry	South	Unknown	Pick-up truck	Other motor vehicle	0
					South	Unknown	Pick-up truck	Other motor vehicle	
2020-Aug-24, Mon,11:30	Clear	Rear end	P.D. only	Dry	East	Slowing or stopping	Delivery van	Other motor vehicle	0
					East	Slowing or stopping	Pick-up truck	Other motor vehicle	
2020-Sep-22, Tue,12:05	Clear	Turning movement	P.D. only	Dry	North	Turning right	Pick-up truck	Other motor vehicle	0
					South	Turning left	Pick-up truck	Other motor vehicle	
2020-Oct-18, Sun,12:38	Clear	Rear end	Non-fatal injury	Dry	East	Going ahead	Unknown	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2020-Oct-23, Fri,17:31	Clear	Angle	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2020-Nov-10, Tue,13:31	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2020-Nov-21, Sat,00:00	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	



Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: CYRVILLE RD @ INNES RD

Traffic Control: Traffic signal

Total Collisions: 117

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2021-Jan-21, Thu,10:00	Snow	Angle	P.D. only	Packed snow	East	Slowing or stopping	Passenger van	Other motor vehicle	0
					North	Turning left	Pick-up truck	Other motor vehicle	
					North	Turning left	Automobile, station wagon	Other motor vehicle	
2021-Feb-08, Mon,15:58	Clear	Rear end	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle	0
					East	Stopped	Pick-up truck	Other motor vehicle	
2021-Feb-10, Wed,07:26	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2021-Feb-17, Wed,16:15	Clear	Rear end	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					West	Slowing or stopping	Pick-up truck	Other motor vehicle	
2021-Feb-26, Fri,14:06	Clear	Angle	Non-fatal injury	Wet	West	Going ahead	Pick-up truck	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2021-Feb-26, Fri,15:12	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Delivery van	Other motor vehicle	
2021-Feb-26, Fri,20:56	Clear	SMV other	Non-fatal injury	Dry	East	Going ahead	Pick-up truck	Pedestrian	1
2021-May-26, Wed,13:45	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Delivery van	Other motor vehicle	0
					West	Going ahead	Pick-up truck	Other motor vehicle	
2021-Jun-24, Thu,12:25	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Truck - dump	Other motor vehicle	
2021-Jun-29, Tue,00:19	Clear	Rear end	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Pick-up truck	Other motor vehicle	
2021-Jul-20, Tue,11:58	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Slowing or stopping	Pick-up truck	Other motor vehicle	



Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: CYRVILLE RD @ INNES RD

Traffic Control: Traffic signal

Total Collisions: 117

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2021-Jul-28, Wed,09:47	Clear	Angle	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle	0
					North	Turning left	Automobile, station wagon	Other motor vehicle	
2021-Aug-03, Tue,21:15	Clear	Rear end	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle	0
					East	Stopped	Pick-up truck	Other motor vehicle	
2021-Sep-18, Sat,17:35	Clear	Rear end	P.D. only	Dry	East	Unknown	Unknown	Other motor vehicle	0
					East	Stopped	Pick-up truck	Other motor vehicle	
2021-Oct-21, Thu,06:36	Clear	SMV other	Non-fatal injury	Wet	East	Going ahead	Automobile, station wagon	Pedestrian	1
2021-Nov-11, Thu,17:30	Clear	Rear end	P.D. only	Dry	South	Turning right	Pick-up truck	Other motor vehicle	0
					South	Turning right	Passenger van	Other motor vehicle	
2021-Nov-16, Tue,17:36	Clear	Rear end	P.D. only	Dry	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Pick-up truck	Other motor vehicle	
2021-Nov-18, Thu,18:14	Rain	Turning movement	P.D. only	Wet	South	Turning left	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2021-Nov-29, Mon,15:40	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Passenger van	Other motor vehicle	
					West	Stopped	Passenger van	Other motor vehicle	
2021-Dec-06, Mon,11:03	Freezing Rain	Sideswipe	P.D. only	Wet	East	Changing lanes	Fire vehicle	Other motor vehicle	0
					East	Going ahead	Passenger van	Other motor vehicle	
2021-Dec-22, Wed,09:30	Snow	Rear end	P.D. only	Packed snow	South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2022-Jan-12, Wed,07:08	Clear	Turning movement	P.D. only	Wet	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Turning left	Pick-up truck	Other motor vehicle	



Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: CYRVILLE RD @ INNES RD

Traffic Control: Traffic signal

Total Collisions: 117

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2022-Jan-27, Thu,19:49	Snow	Approaching	P.D. only	Loose snow	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2022-Feb-22, Tue,14:45	Freezing Rain	SMV other	Non-fatal injury	Ice	North	Turning right	Automobile, station wagon	Pedestrian	1
2022-May-26, Thu,11:15	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Pick-up truck	Other motor vehicle	0
					East	Going ahead	Pick-up truck	Other motor vehicle	
2022-Jun-24, Fri,13:29	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Pick-up truck	Other motor vehicle	0
					East	Stopped	Pick-up truck	Other motor vehicle	
2022-Jul-02, Sat,15:40	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2022-Jul-04, Mon,14:03	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Pick-up truck	Other motor vehicle	
2022-Jul-04, Mon,17:20	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Truck - closed	Other motor vehicle	0
					East	Slowing or stopping	Pick-up truck	Other motor vehicle	
2022-Jul-29, Fri,19:41	Clear	Turning movement	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle	0
					West	Turning left	Truck - tractor	Other motor vehicle	
					West	Turning left	Truck-other	Other motor vehicle	
2022-Aug-15, Mon,10:40	Clear	Rear end	P.D. only	Dry	South	Going ahead	Pick-up truck	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2022-Aug-24, Wed,11:00	Clear	Rear end	P.D. only	Dry	West	Going ahead	Pick-up truck	Other motor vehicle	0
					West			Other motor vehicle	
2022-Sep-28, Wed,19:45	Clear	Rear end	Non-fatal injury	Dry	East	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	



Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: CYRVILLE RD @ INNES RD

Traffic Control: Traffic signal

Total Collisions: 117

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2022-Oct-03, Mon,11:55	Clear	Turning movement	P.D. only	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2022-Oct-04, Tue,11:47	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Pick-up truck	Other motor vehicle	
2022-Oct-21, Fri,12:45	Clear	Rear end	P.D. only	Dry	East	Going ahead	Unknown	Other motor vehicle	0
					East	Stopped	Delivery van	Other motor vehicle	
2022-Oct-21, Fri,14:30	Clear	Turning movement	P.D. only	Dry	South	Turning left	Automobile, station wagon	Other motor vehicle	0
					South	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2022-Nov-20, Sun,12:35	Clear	Rear end	P.D. only	Dry	West	Stopped	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Pick-up truck	Other motor vehicle	
2022-Dec-18, Sun,19:30	Clear	Rear end	P.D. only	Wet	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	

Location: CYRVILLE RD btwn INNES RD & END

Traffic Control: No control

Total Collisions: 2

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2019-Aug-19, Mon,07:00	Clear	SMV other	Fatal injury	Dry	North	Going ahead	Truck - open	Pedestrian	1
2021-Dec-19, Sun,07:53	Snow	SMV other	P.D. only	Loose snow	South	Making "U" turn	Pick-up truck	Curb	0

Location: HWY 417 INNES IC112R57 @ INNES RD

Traffic Control: Traffic signal

Total Collisions: 32

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2018-May-22, Tue,15:12	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
					East	Stopped	Automobile, station wagon	Other motor vehicle	



Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: HWY 417 INNES IC112R57 @ INNES RD

Traffic Control: Traffic signal

Total Collisions: 32

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2018-Jul-06, Fri,11:30	Clear	Angle	P.D. only	Dry	East	Going ahead	Passenger van	Other motor vehicle	0
					South	Turning left	Passenger van	Other motor vehicle	
2018-Jul-07, Sat,21:34	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jul-14, Sat,21:15	Clear	Angle	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2018-Sep-13, Thu,12:45	Clear	Sideswipe	P.D. only	Dry	South	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2018-Sep-15, Sat,11:56	Clear	Rear end	P.D. only	Dry	East	Going ahead	Unknown	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Oct-09, Tue,23:29	Clear	Sideswipe	P.D. only	Dry	South	Turning left	Truck and trailer	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2018-Oct-18, Thu,21:43	Clear	Sideswipe	P.D. only	Dry	South	Turning left	Truck and trailer	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2019-Jan-20, Sun,06:27	Snow	Angle	P.D. only	Loose snow	West	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2019-Feb-05, Tue,11:15	Clear	Angle	Non-fatal injury	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2019-Mar-07, Thu,16:11	Clear	Rear end	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2019-Mar-08, Fri,23:53	Clear	Rear end	P.D. only	Dry	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	



Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: HWY 417 INNES IC112R57 @ INNES RD

Traffic Control: Traffic signal

Total Collisions: 32

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2019-Nov-10, Sun,22:15	Clear	Angle	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Turning left	Pick-up truck	Other motor vehicle	
2020-Jul-14, Tue,08:05	Clear	Angle	P.D. only	Dry	East	Unknown	Unknown	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2020-Aug-07, Fri,09:00	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Pick-up truck	Other motor vehicle	
2020-Aug-19, Wed,23:31	Clear	SMV other	Non-fatal injury	Dry	South	Turning left	Motorcycle	Skidding/sliding	0
2020-Oct-14, Wed,12:20	Clear	Rear end	P.D. only	Dry	West	Unknown	Unknown	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2021-Jan-20, Wed,15:13	Clear	Rear end	Non-fatal injury	Dry	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Pick-up truck	Other motor vehicle	
2021-Feb-04, Thu,16:30	Clear	Rear end	P.D. only	Dry	South	Going ahead	Passenger van	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2021-Apr-07, Wed,06:47	Clear	Angle	P.D. only	Dry	West	Going ahead	Pick-up truck	Other motor vehicle	0
					South	Turning left	Passenger van	Other motor vehicle	
					South	Turning left	Pick-up truck	Other motor vehicle	
2021-Jun-15, Tue,10:36	Clear	Sideswipe	P.D. only	Dry	South	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Truck - dump	Other motor vehicle	
2021-Jun-17, Thu,18:01	Clear	Rear end	P.D. only	Dry	West	Going ahead	Truck - dump	Other motor vehicle	0
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2021-Aug-17, Tue,10:16	Clear	SMV other	Non-fatal injury	Dry	West	Going ahead	Pick-up truck	Curb	0
2021-Aug-21, Sat,06:30	Clear	Sideswipe	P.D. only	Dry	South	Turning left	Pick-up truck	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	



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Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: HWY 417 INNES IC112R57 @ INNES RD

Traffic Control: Traffic signal

Total Collisions: 32

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2021-Aug-27, Fri,09:00	Clear	Angle	P.D. only	Dry	West	Going ahead	Pick-up truck	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2021-Aug-27, Fri,10:00	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Delivery van	Other motor vehicle	
2021-Oct-05, Tue,08:33	Clear	Rear end	P.D. only	Dry	West	Going ahead	Delivery van	Other motor vehicle	0
					West	Slowing or stopping	Pick-up truck	Other motor vehicle	
2021-Nov-24, Wed,09:55	Clear	Sideswipe	P.D. only	Dry	South	Turning left	Unknown	Other motor vehicle	0
					South	Turning left	Pick-up truck	Other motor vehicle	
2022-Jan-27, Thu,08:59	Clear	Angle	P.D. only	Wet	West	Going ahead	Pick-up truck	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	
					South	Turning left	Automobile, station wagon	Other motor vehicle	
2022-Feb-05, Sat,16:25	Clear	Sideswipe	P.D. only	Dry	South	Turning left	Unknown	Other motor vehicle	0
					South	Turning left	Pick-up truck	Other motor vehicle	
2022-Mar-03, Thu,11:07	Clear	Angle	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Turning left	Pick-up truck	Other motor vehicle	
2022-Mar-20, Sun,10:15	Clear	Sideswipe	P.D. only	Dry	South	Turning left	Truck and trailer	Other motor vehicle	0
					South	Turning left	Automobile, station wagon	Other motor vehicle	

Location: HWY 417 INNES IC112R58 @ INNES RD

Traffic Control: Yield sign

Total Collisions: 2

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2020-Feb-22, Sat,15:23	Clear	Rear end	P.D. only	Dry	South	Merging	Unknown	Other motor vehicle	0
					South	Merging	Automobile, station wagon	Other motor vehicle	



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Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: HWY 417 INNES IC112R58 @ INNES RD

Traffic Control: Yield sign

Total Collisions: 2

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2020-Mar-04, Wed,11:53	Clear	Rear end	P.D. only	Wet	West	Merging	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Unknown	Other motor vehicle	

Location: HWY 417 INNES IC112R67 @ INNES RD

Traffic Control: Yield sign

Total Collisions: 2

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2018-Sep-18, Tue,13:53	Clear	Rear end	Non-fatal injury	Dry	East	Going ahead	Pick-up truck	Other motor vehicle	0
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2021-Apr-26, Mon,18:40	Clear	Angle	P.D. only	Dry	North	Merging	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	

Location: HWY 417 INNES IC112R68 @ INNES RD

Traffic Control: Traffic signal

Total Collisions: 27

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2018-Jun-20, Wed,10:13	Clear	Rear end	P.D. only	Dry	East	Going ahead	Unknown	Other motor vehicle	0
					East	Stopped	Pick-up truck	Other motor vehicle	
2018-Jun-20, Wed,10:22	Clear	Rear end	P.D. only	Dry	West	Going ahead	Delivery van	Other motor vehicle	0
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jun-29, Fri,10:26	Clear	Rear end	P.D. only	Dry	North	Turning right	Truck - closed	Other motor vehicle	0
					North	Turning right	Automobile, station wagon	Other motor vehicle	
2018-Jul-24, Tue,10:25	Clear	Rear end	P.D. only	Dry	South	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Mar-13, Wed,16:44	Snow	Sideswipe	P.D. only	Loose snow	North	Unknown	Unknown	Other motor vehicle	0
					North	Stopped	Automobile, station wagon	Other motor vehicle	



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Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: HWY 417 INNES IC112R68 @ INNES RD

Traffic Control: Traffic signal

Total Collisions: 27

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2019-Apr-22, Mon,15:53	Clear	Sideswipe	P.D. only	Dry	North	Turning left	Truck and trailer	Other motor vehicle	0
					North	Turning left	Automobile, station wagon	Other motor vehicle	
2019-Jul-25, Thu,17:30	Clear	Angle	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Turning left	Automobile, station wagon	Other motor vehicle	
2019-Aug-10, Sat,07:39	Clear	SMV other	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Pole (utility, power)	0
2020-Apr-14, Tue,06:08	Clear	Angle	P.D. only	Dry	North	Turning left	Pick-up truck	Other motor vehicle	0
					West	Going ahead	Truck - open	Other motor vehicle	
2020-Jul-08, Wed,15:56	Clear	Rear end	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
					East	Stopped	Pick-up truck	Other motor vehicle	
2020-Oct-27, Tue,09:27	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Truck - closed	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2020-Dec-04, Fri,08:25	Clear	Sideswipe	P.D. only	Dry	North	Turning left	Unknown	Other motor vehicle	0
					North	Turning left	Passenger van	Other motor vehicle	
2021-Jan-22, Fri,06:03	Clear	Angle	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Turning left	Pick-up truck	Other motor vehicle	
2021-Feb-01, Mon,08:01	Clear	Sideswipe	P.D. only	Dry	North	Turning left	Truck and trailer	Other motor vehicle	0
					North	Turning left	Pick-up truck	Other motor vehicle	
2021-Jun-07, Mon,12:20	Clear	Rear end	P.D. only	Dry	North	Turning right	Pick-up truck	Other motor vehicle	0
					North	Turning right	Automobile, station wagon	Other motor vehicle	
2021-Jul-18, Sun,20:34	Clear	SMV other	P.D. only	Dry	North	Turning right	Automobile, station wagon	Skidding/sliding	0
2021-Sep-28, Tue,06:57	Clear	Rear end	P.D. only	Dry	North	Turning right	Pick-up truck	Other motor vehicle	0
					North	Turning right	Pick-up truck	Other motor vehicle	
					North	Turning right	Automobile, station wagon	Other motor vehicle	



Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: HWY 417 INNES IC112R68 @ INNES RD

Traffic Control: Traffic signal

Total Collisions: 27

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2021-Oct-29, Fri,14:47	Clear	Rear end	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2021-Dec-03, Fri,17:20	Clear	Rear end	P.D. only	Slush	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Pick-up truck	Other motor vehicle	
2022-May-07, Sat,02:57	Clear	Rear end	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
					East	Stopped	Pick-up truck	Other motor vehicle	
2022-May-27, Fri,11:15	Clear	Angle	P.D. only	Dry	West	Changing lanes	Passenger van	Other motor vehicle	0
					North	Turning left	Pick-up truck	Other motor vehicle	
2022-Jun-04, Sat,10:07	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Pick-up truck	Other motor vehicle	0
					West	Going ahead	Pick-up truck	Other motor vehicle	
2022-Jun-17, Fri,09:27	Clear	Rear end	Non-fatal injury	Dry	West	Going ahead	Truck - closed	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Pick-up truck	Other motor vehicle	
2022-Jul-05, Tue,13:42	Rain	Sideswipe	Non-reportable	Wet	North	Turning left	Pick-up truck	Other motor vehicle	0
					North	Turning left	Truck and trailer	Other motor vehicle	
2022-Sep-16, Fri,05:30	Clear	Rear end	P.D. only	Dry	East	Going ahead	Unknown	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2022-Oct-11, Tue,08:00	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2022-Nov-03, Thu,17:00	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Passenger van	Other motor vehicle	



Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: INNES RD @ 215 W OF CYRVILLE RD/HOME DEPOT W

Traffic Control: Traffic signal

Total Collisions: 16

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2018-Mar-19, Mon,16:15	Clear	Angle	Non-fatal injury	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Passenger van	Other motor vehicle	
2018-Apr-02, Mon,15:28	Clear	SMV other	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Pedestrian	1
2018-Apr-05, Thu,11:51	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Feb-12, Tue,10:08	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Stopped	Automobile, station wagon	Other motor vehicle	
2019-May-22, Wed,07:15	Clear	Rear end	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2019-May-30, Thu,16:00	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-May-31, Fri,08:30	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Aug-14, Wed,08:20	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Oct-07, Mon,06:25	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					West	Unknown	Unknown	Other motor vehicle	
2019-Oct-15, Tue,20:32	Clear	Turning movement	P.D. only	Dry	East	Turning left	Pick-up truck	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2020-Jan-19, Sun,12:27	Clear	Turning movement	P.D. only	Slush	West	Going ahead	Pick-up truck	Other motor vehicle	0
					East	Turning left	Pick-up truck	Other motor vehicle	



Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: INNES RD @ 215 W OF CYRVILLE RD/HOME DEPOT W

Traffic Control: Traffic signal

Total Collisions: 16

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2020-Mar-01, Sun,08:10	Clear	Rear end	P.D. only	Ice	West	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2021-Jul-06, Tue,19:40	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Turning left	Unknown	Other motor vehicle	
2022-Jan-19, Wed,17:25	Snow	Sideswipe	P.D. only	Loose snow	East	Going ahead	Pick-up truck	Skidding/sliding	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2022-Mar-21, Mon,10:33	Clear	Rear end	Non-fatal injury	Dry	West	Going ahead	Pick-up truck	Other motor vehicle	0
					West	Going ahead	Truck - open	Other motor vehicle	
2022-Aug-27, Sat,05:56	Clear	SMV other	P.D. only	Dry	West	Going ahead	Pick-up truck	Pole (utility, power)	0

Location: INNES RD @ STONEHENGE CRES E

Traffic Control: Traffic signal

Total Collisions: 21

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2018-Jan-16, Tue,05:47	Snow	Angle	P.D. only	Loose snow	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					North	Turning left	Automobile, station wagon	Other motor vehicle	
2018-Feb-06, Tue,17:53	Clear	Turning movement	P.D. only	Slush	South	Turning left	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Feb-23, Fri,18:06	Freezing Rain	Sideswipe	P.D. only	Ice	West	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Unknown	Other motor vehicle	
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jun-12, Tue,07:50	Clear	Rear end	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
					West	Stopped	Passenger van	Other motor vehicle	



Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: INNES RD @ STONEHENGE CRES E

Traffic Control: Traffic signal

Total Collisions: 21

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2018-Jun-23, Sat,18:56	Rain	Turning movement	P.D. only	Wet	East	Making "U" turn	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Aug-04, Sat,11:46	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Nov-29, Fri,16:41	Clear	Rear end	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2020-May-14, Thu,16:14	Clear	Angle	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Pick-up truck	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
2020-Jun-19, Fri,19:09	Clear	Angle	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Turning left	Automobile, station wagon	Other motor vehicle	
2020-Aug-06, Thu,07:45	Clear	Rear end	P.D. only	Dry	East	Going ahead	Passenger van	Other motor vehicle	0
					East	Stopped	Pick-up truck	Other motor vehicle	
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2021-Sep-20, Mon,16:30	Clear	Rear end	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle	0
					East	Slowing or stopping	Pick-up truck	Other motor vehicle	
					East	Slowing or stopping	Pick-up truck	Other motor vehicle	
2021-Oct-03, Sun,16:26	Rain	Angle	Non-fatal injury	Wet	West	Going ahead	Pick-up truck	Other motor vehicle	0
					South	Turning left	Pick-up truck	Other motor vehicle	
2021-Nov-05, Fri,17:23	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Unknown	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2021-Nov-22, Mon,21:12	Clear	Turning movement	Non-fatal injury	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Pick-up truck	Other motor vehicle	



Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: INNES RD @ STONEHENGE CRES E

Traffic Control: Traffic signal

Total Collisions: 21

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2021-Dec-11, Sat,11:10	Freezing Rain	Rear end	P.D. only	Ice	West	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2022-Apr-06, Wed,14:59	Clear	Rear end	P.D. only	Dry	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Pick-up truck	Other motor vehicle	
2022-May-23, Mon,19:15	Clear	Sideswipe	P.D. only	Dry	West	Changing lanes	Passenger van	Other motor vehicle	0
					West	Stopped	Pick-up truck	Other motor vehicle	
2022-Aug-12, Fri,18:08	Clear	Rear end	P.D. only	Dry	West	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Pick-up truck	Other motor vehicle	
2022-Aug-23, Tue,11:50	Clear	Sideswipe	Non-fatal injury	Dry	West	Going ahead	Pick-up truck	Other motor vehicle	0
					West	Changing lanes	Automobile, station wagon	Other motor vehicle	
					East	Going ahead	Passenger van	Other motor vehicle	
2022-Sep-23, Fri,15:15	Clear	Rear end	P.D. only	Dry	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2022-Nov-11, Fri,16:00	Rain	Sideswipe	P.D. only	Wet	North	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Changing lanes	Unknown	Other motor vehicle	

Location: INNES RD @ STONEHENGE CRES W

Traffic Control: Traffic signal

Total Collisions: 25

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2018-Jan-07, Sun,18:00	Snow	Rear end	Non-fatal injury	Loose snow	West	Slowing or stopping	Pick-up truck	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2018-Jan-14, Sun,10:36	Clear	Rear end	P.D. only	Ice	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	



Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: INNES RD @ STONEHENGE CRES W

Traffic Control: Traffic signal

Total Collisions: 25

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2018-Feb-17, Sat,04:45	Clear	SMV other	P.D. only	Dry	South	Turning right	Automobile, station wagon	Pole (utility, power)	0
2018-Sep-13, Thu,08:52	Clear	Angle	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Nov-03, Sat,12:35	Clear	Turning movement	P.D. only	Wet	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Turning left	Automobile, station wagon	Other motor vehicle	
2018-Dec-03, Mon,05:43	Clear	Angle	Non-fatal injury	Loose snow	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Going ahead	Automobile, station wagon	Other motor vehicle	
2018-Dec-13, Thu,13:13	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Truck - tractor	Other motor vehicle	
2019-Mar-07, Thu,18:00	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Mar-09, Sat,06:56	Clear	Angle	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Turning right	Automobile, station wagon	Other motor vehicle	
2019-Apr-15, Mon,15:33	Rain	Rear end	P.D. only	Wet	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	
2019-Sep-26, Thu,09:00	Rain	Sideswipe	P.D. only	Wet	West	Changing lanes	Pick-up truck	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Oct-05, Sat,13:25	Clear	Rear end	Non-fatal injury	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2019-Nov-13, Wed,15:31	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2019-Nov-20, Wed,13:03	Clear	Angle	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					South	Going ahead	Automobile, station wagon	Other motor vehicle	



Transportation Services - Traffic Services

Collision Details Report - Public Version

From: January 1, 2018 **To:** December 31, 2022

Location: INNES RD @ STONEHENGE CRES W

Traffic Control: Traffic signal

Total Collisions: 25

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2019-Nov-30, Sat,16:01	Clear	Rear end	Non-fatal injury	Dry	West	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2020-Mar-13, Fri,10:02	Rain	Rear end	P.D. only	Wet	West	Going ahead	Automobile, station wagon	Other motor vehicle	0
					West	Stopped	Automobile, station wagon	Other motor vehicle	
2020-May-28, Thu,14:02	Clear	Angle	Non-fatal injury	Dry	East	Going ahead	Bicycle	Other motor vehicle	0
					South	Turning right	Pick-up truck	Cyclist	
2020-Jul-16, Thu,12:30	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Pick-up truck	Other motor vehicle	0
					East	Going ahead	Automobile, station wagon	Other motor vehicle	
2021-May-26, Wed,16:22	Clear	Turning movement	Non-fatal injury	Dry	East	Turning right	Pick-up truck	Cyclist	0
					East	Going ahead	Bicycle	Other motor vehicle	
2021-Jul-03, Sat,15:58	Clear	SMV other	Non-fatal injury	Dry	West	Going ahead	Automobile, station wagon	Fence/noice barrier	0
2021-Aug-30, Mon,09:17	Clear	Angle	Non-fatal injury	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle	0
					North	Turning left	Pick-up truck	Other motor vehicle	
2021-Oct-07, Thu,16:39	Clear	Rear end	P.D. only	Dry	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle	0
					East	Stopped	Automobile, station wagon	Other motor vehicle	
					East	Stopped	Automobile, station wagon	Other motor vehicle	
2021-Nov-05, Fri,16:32	Clear	Rear end	P.D. only	Dry	West	Unknown	Unknown	Other motor vehicle	0
					West	Stopped	Pick-up truck	Other motor vehicle	
2021-Nov-10, Wed,08:23	Clear	SMV other	Non-fatal injury	Dry	South	Turning left	Automobile, station wagon	Pedestrian	1
2022-May-06, Fri,17:04	Clear	Rear end	P.D. only	Dry	West	Unknown	Unknown	Other motor vehicle	0
					West	Stopped	Pick-up truck	Other motor vehicle	

Appendix D

Existing Traffic Signal Timing Data

Traffic Signal Timing

City of Ottawa, Public Works Department

Traffic Signal Operations Unit

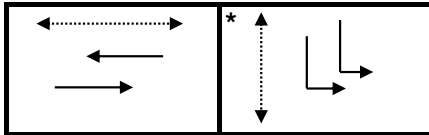
Intersection:	<i>Main:</i> Innes	<i>Side:</i> 417 EB Ramp
Controller:	ATC3	TSD: 5863
Author:	Nathan Cook	Date: 02-Jun-2025

Existing Timing Plans[†]

	Plan				Ped Minimum Time			Walk	DW	A+R
	OFF Peak 2	PM Peak 3	Night 4	Weekend 5	Early AM 11	Evening 13	AM Peak 31			
Cycle	100	140	75	100	140	120	160			
Offset	77	22	X	79	8	22	8			
EB Thru	65	87	48	65	110	80	130	-	-	4.6+1.4
WB Thru	65	87	48	65	110	80	130	25	5	4.6+1.4
SB Thru	35	53	27	35	30	40	30	7	11	3.3+2.8

Phasing Sequence[‡]

Plan: All



Schedule

Weekday

Time	Plan
0:10	4
6:00	11
7:00	31
9:30	2
15:00	3
18:00	13
18:30	2
22:30	4

Saturday

Time	Plan
0:15	4
7:00	2
10:00	5
18:00	2
22:30	4

Sunday

Time	Plan
0:15	4
7:00	2
10:00	5
18:00	2
22:00	4

Notes

[†]: Time for each direction includes amber and all red intervals

[‡]: Start of first phase should be used as reference point for offset

Asterisk (*) Indicates actuated phase

(fp): Fully Protected Left Turn

←.....→ Pedestrian signal

Cost is \$62.38 (\$55.20 + HST)

Traffic Signal Timing

City of Ottawa, Public Works Department

Traffic Signal Operations Unit

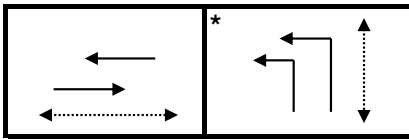
Intersection:	<i>Main:</i> Innes	<i>Side:</i> 417 WB Ramp
Controller:	ATC3	TSD: 5826
Author:	Nathan Cook	Date: 02-Jun-2025

Existing Timing Plans†

	Plan				Ped Minimum Time			Walk	DW	A+R
	OFF Peak 2	PM Peak 3	Night 4	Weekend 5	Early AM 11	Evening 13	AM Peak 31			
Cycle	110	140	75	110	140	120	160			
Offset	94	15	X	11	136	8	150			
EB Thru	80	105	48	80	105	93	125	26	5	4.6+1.4
WB Thru	80	105	48	80	105	93	125	-	-	4.6+1.4
NB Thru	30	35	27	30	35	27	35	7	14	3.3+2.5

Phasing Sequence‡

Plan: All



Schedule

Weekday		Saturday		Sunday	
Time	Plan	Time	Plan	Time	Plan
0:10	4	0:15	4	0:15	4
6:00	11	7:00	2	7:00	2
7:00	31	10:00	5	10:00	5
9:30	2	18:00	2	18:00	2
15:00	3	22:30	4	22:00	4
18:00	13				
18:30	2				
22:30	4				

Notes

†: Time for each direction includes amber and all red intervals

‡: Start of first phase should be used as reference point for offset

Asterisk (*) Indicates actuated phase

(fp): Fully Protected Left Turn

◀.....▶ Pedestrian signal

Cost is \$62.38 (\$55.20 + HST)

Traffic Signal Timing

City of Ottawa, Public Works Department

Traffic Signal Operations Unit

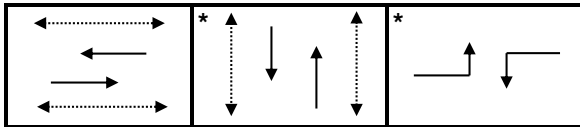
Intersection:	Main: Innes	Side: 215m W of Cyrville
Controller:	ATC3	TSD: 5818
Author:	Nathan Cook	Date: 02-Jun-2025

Existing Timing Plans†

	Plan							Ped Minimum Time		
	OFF Peak 2	PM Peak 3	Night 4	Weekend 5	Early AM 11	Evening 13	AM Peak 31	Walk	DW	A+R
Cycle	110	140	100	110	140	120	160			
Offset	1	19	x	26	1	18	5			
EB Thru	46	75	39	46	79	58	99	7	25	3.7+2.7
WB Thru	46	75	39	46	79	58	99	7	25	3.7+2.7
NB Thru	46	46	46	46	46	46	46	7	32	3.3+3.7
SB Thru	46	46	46	46	46	46	46	7	32	3.3+3.7
EB Left (fp)	18	19	15	18	15	16	15	-	-	3.7+2.9
WB Left (fp)	18	19	15	18	15	16	15	-	-	3.7+2.9

Phasing Sequence‡

Plan: All



Notes: 1) For Plans 2, 3, 4, 5, 11, 13, if the NS pedestrian phase is not actuated, the NS Thru movement will force off after 15

Schedule

Weekday		Saturday		Sunday	
Time	Plan	Time	Plan	Time	Plan
0:10	4	0:15	4	0:15	4
6:00	11	7:00	2	7:00	2
7:00	31	10:00	5	10:00	5
9:30	2	18:00	2	18:00	2
15:00	3	22:30	4	22:00	4
18:00	13				
18:30	2				
22:30	4				

Notes

†: Time for each direction includes amber and all red intervals
‡: Start of first phase should be used as reference point for offset
Asterisk (*) Indicates actuated phase
(fp): Fully Protected Left Turn
◄.....► Pedestrian signal

Cost is \$62.38 (\$55.20 + HST)

Traffic Signal Timing

City of Ottawa, Public Works Department

Traffic Signal Operations Unit

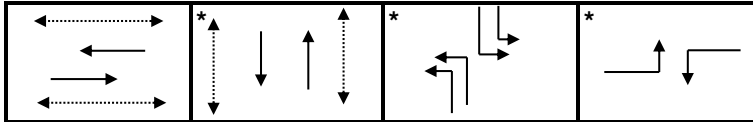
Intersection:	Main: Innes	Side: Cyrville
Controller:	MS 3200	TSD: 5496
Author:	Nathan Cook	Date: 02-Jun-2025

Existing Timing Plans†

	Plan							Ped Minimum Time		
	OFF Peak 2	PM Peak 3	Night 4	Weekend 5	Early AM 11	Evening 13	AM Peak 31	Walk	DW	A+R
Cycle	110	140	110	110	140	120	160			
Offset	7	19	X	23	4	19	2			
EB Thru	33	58	37	32	71	44	87	7	19	3.7+2.5
WB Thru	33	58	37	32	71	44	87	7	19	3.7+2.5
NB Thru	41	41	41	41	41	41	41	7	27	3.3+3.6
SB Thru	41	41	41	41	41	41	41	7	27	3.3+3.6
NB Left (fp)	18	24	18	17	15	20	15	-	-	3.3+3.3
SB Left (fp)	18	24	18	17	15	20	15	-	-	3.3+3.3
EB Left (fp)	18	17	14	20	13	15	17	-	-	3.7+2.5
WB Left (fp)	18	17	14	20	13	15	17	-	-	3.7+2.5

Phasing Sequence‡

Plan: All



Notes: 1) If the NS pedestrian phases are not actuated, the NS Thru movement will force off after 20s green

Schedule

Weekday		Saturday		Saturday	
Time	Plan	Time	Plan	Time	Plan
0:10	4	0:15	4	0:15	4
6:00	11	7:00	2	7:00	2
7:00	31	10:00	5	10:00	5
9:30	2	18:00	2	18:00	2
15:00	3	22:30	4	22:00	4
18:00	13				
18:30	2				
22:30	4				

Notes

†: Time for each direction includes amber and all red intervals
‡: Start of first phase should be used as reference point for offset
Asterisk (*) Indicates actuated phase
(fp): Fully Protected Left Turn
◄.....► Pedestrian signal

Traffic Signal Timing

City of Ottawa, Public Works Department

Traffic Signal Operations Unit

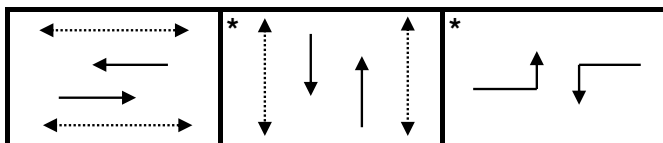
Intersection:	<i>Main:</i> Innes	<i>Side:</i> Stonehenge W
Controller:	ATC3	TSD: 5801
Author:	Nathan Cook	Date: 02-Jun-2025

Existing Timing Plans†

	Plan				Ped Minimum Time			Walk	DW	A+R
	OFF Peak 2	PM Peak 3	Night 4	Weekend 5	Early AM 11	Evening 13	AM Peak 31			
Cycle	110	140	90	110	140	120	160			
Offset	23	18	X	23	123	26	147			
EB Thru	52	82	35	52	82	62	98	7	14	3.7+2.3
WB Thru	52	82	35	52	82	62	98	7	14	3.7+2.3
NB Thru	43	43	43	43	43	43	43	7	28	3.0+4.5
SB Thru	43	43	43	43	43	43	43	7	28	3.0+4.5
EB Left (fp)	15	15	12	15	15	15	19	-	-	3.7+2.5
WB Left (fp)	15	15	12	15	15	15	19	-	-	3.7+2.5

Phasing Sequence‡

Plan: All



Schedule

Weekday

Time	Plan
0:10	4
6:00	11
7:00	31
9:30	2
15:00	3
18:00	13
18:30	2
22:30	4

Saturday

Time	Plan
0:15	4
7:00	2
10:00	5
18:00	2
22:30	4

Sunday

Time	Plan
0:15	4
7:00	2
10:00	5
18:00	2
22:00	4

Notes

†: Time for each direction includes amber and all red intervals

Appendix E

MMLOS Worksheets

Multi-Modal Level of Service - Segments Form

Project: Gloucester Costco Gas Bar Addition
Consultant: Kittelson Canada, LLC
Date: Oct 2025
Scenario: 2025 Existing Conditions

Segment Name		Cyrville Road: South of Innes Road			
OP Transect / Policy Area		Outer Urban or Suburban			
Segment Component Side of Street		Majority (>50%)		Critical	
		W or N	E or S	W or N	E or S
Pedestrian	PLOS Inputs				
	Posted Speed (km/h)	50 km/h		50 km/h	
	Two-Way ADT	1,226		1,226	
	Pedestrian Facility	None	None	None	None
	Does the facility meet the TMP Sidewalk or MUP Policy? If not, for MUPs, does the location have a low volume of peak daily users AND are pedestrian volumes likely less than 20% of total users?	Yes	Yes	Yes	Yes
	Facility Width (m)	-	-	-	-
	Offset from Motor Vehicle Travel Lanes (m)	-	-	-	-
	Presence of Adjacent Parking?	-	-	-	-
	General Purpose Curb Lane ADT	-	-	-	-
	Max. Distance between Controlled Crossings (m)	-	-	-	-
Score	-	-	-	-	
PLOS	-	-	-	-	
Target PLOS	C				
Bicycle	BLOS Inputs				
	Cycling Route Classification	Elsewhere			
	Cycling Facility	Shared Operating Space	Shared Operating Space	Shared Operating Space	Shared Operating Space
	Is the minimum level of separation provided according to OTM Book 18 Pre-Selection Nomograph - Rural Context (Figure 5.6)? (for paved shoulders)	-	-	-	-
	Facility Operation	-	-	-	-
	Pedestrian/Cyclist Volume	-	-	-	-
	Facility Width	-	-	-	-
	Boulevard/Buffer Width (excluding curb)	-	-	-	-
	Unsignalized Roadway Crossing Type (where cyclists are required to yield)	None	None	None	None
	Number of Travel Lanes at Crossing	-	-	-	-
	Crossing includes Median Refuge (≥ 2.7m)	-	-	-	-
	Cross-street Posted Speed (km/h)	-	-	-	-
	Cycling Path Blockages (e.g. bus stops and/or loading zones)	Rare	Rare	Rare	Rare
	Score	1.60	1.60	1.60	1.60
	BLOS	D	D	D	D
	Target BLOS	C			
Transit	TLOS Inputs				
	Transit Facility	Mixed Traffic			
	Facility Type				
	Expected Transit Running Time				
	Transit Travel Speed (if available)				
	TLOS	-	-		
Target TLOS	E (D for frequent transit routes)				
Public Realm	PRLOS Inputs				
	Context	Other Streets	Other Streets		
	Inner Boulevard Width	≤ 0.6m	≤ 0.6m		
	Middle Boulevard Width	≤ 0.5m	≤ 0.5m		
	Outer Boulevard (Frontage) Width	≤ 0.5m	≤ 0.5m		
	Transit Route on Segment?	No	No		
	Bus Stop Elements	-	-		
	Number of Midblock Traffic Lanes (both travel directions)	≤ 2			
	Score	14.10	14.10		
	PRLOS	D	D		
	D				

Multi-Modal Level of Service - Segments Form

Project: Gloucester Costco Gas Bar Addition
Consultant: Kittelson Canada, LLC
Date: Oct 2025
Scenario: 2027 Build Out Conditions

Segment Name		Cyrville Road: South of Innes Road			
OP Transect / Policy Area		Outer Urban or Suburban			
Segment Component		Majority (>50%)		Critical	
Side of Street		W or N	E or S	W or N	E or S
Pedestrian	PLOS Inputs				
	Posted Speed (km/h)	50 km/h		50 km/h	
	Two-Way ADT	1,226		1,226	
	Pedestrian Facility	Sidewalk	None	None	None
	Does the facility meet the TMP Sidewalk or MUP Policy? If not, for MUPs, does the location have a low volume of peak daily users AND are pedestrian volumes likely less than 20% of total users?	Yes	Yes	Yes	Yes
	Facility Width (m)	1.80m	-	-	-
	Offset from Motor Vehicle Travel Lanes (m)	< 0.5m	-	-	-
	Presence of Adjacent Parking?	-	-	-	-
	General Purpose Curb Lane ADT	≤ 3000	-	-	-
	Max. Distance between Controlled Crossings (m)	-	-	-	-
Score	3.50	-	-	-	-
PLOS	B	-	-	-	-
Target PLOS	C				
Bicycle	BLOS Inputs				
	Cycling Route Classification	Elsewhere			
	Cycling Facility	Shared Operating Space	Shared Operating Space	Shared Operating Space	Shared Operating Space
	Is the minimum level of separation provided according to OTM Book 18 Pre-Selection Nomograph - Rural Context (Figure 5.6)? (for paved shoulders)	-	-	-	-
	Facility Operation	-	-	-	-
	Pedestrian/Cyclist Volume	-	-	-	-
	Facility Width	-	-	-	-
	Boulevard/Buffer Width (excluding curb)	-	-	-	-
	Unsignalized Roadway Crossing Type (where cyclists are required to yield)	None	None	None	None
	Number of Travel Lanes at Crossing	-	-	-	-
	Crossing includes Median Refuge (≥ 2.7m)	-	-	-	-
	Cross-street Posted Speed (km/h)	-	-	-	-
	Cycling Path Blockages (e.g. bus stops and/or loading zones)	Rare	Rare	Rare	Rare
	Score	1.60	1.60	1.60	1.60
BLOS	D	D	D	D	
Target BLOS	C				
Transit	TLOS Inputs				
	Transit Facility	Mixed Traffic			
	Facility Type				
	Expected Transit Running Time				
	Transit Travel Speed (if available)				
	TLOS	-	-		
Target TLOS	E (D for frequent transit routes)				
Public Realm	PRLOS Inputs				
	Context	Other Streets	Other Streets		
	Inner Boulevard Width	≤ 0.6m	≤ 0.6m		
	Middle Boulevard Width	≤ 0.5m	≤ 0.5m		
	Outer Boulevard (Frontage) Width	≤ 0.5m	≤ 0.5m		
	Transit Route on Segment?	No	No		
	Bus Stop Elements	-	-		
	Number of Midblock Traffic Lanes (both travel directions)	≤ 2			
	Score	18.60	14.10		
	PRLOS	C	D		
	C				

Multi-Modal Level of Service - Intersections Form

Project: Gloucester Costco Gas Bar Addition
Consultant: Kittelson Canada, LLC
Date: Oct 2025
Scenario: 2025 Existing Conditions

Intersection Name		Highway 417 SB Ramp / Innes Road			
OP Transect / Policy Area		Outer Urban or Suburban			
Pedestrian	PLOS Inputs				
	Pedestrians Crossing the	North Leg	South Leg	East Leg	West Leg
	Number of Travel Lanes Crossed	No Crosswalk	No Crosswalk	No Crosswalk	6
	Median Refuge (≥2.7m)	-	-	-	No
	Crosswalk Treatment	-	-	-	Std Transverse Markings
	Signal Cycle Length (sec)	160.0			
	Effective Walk Time (sec)	-	-	-	99.0
	Conflict with Right-Turn Vehicles (For PLOS & BLOS)	WBR	EBR	NBR	SBR
	Right-Turn Geometry	Conventional Right-Turn Channel	Conventional Right-Turn Channel	No Right-Turn / Prohib.	Conventional Right-Turn Channel
	Right-Turn Signal Phasing	-	-	-	-
	Right-Turn Volume	> 300 veh/h	> 300 veh/h	> 300 veh/h	≤ 150 veh/h
	Right-Turn Effective Corner Radius	-	-	-	-
	Cross-street Posted Speed (km/h)	80 km/h		80 km/h	
	Conflict with Left-Turn Vehicles (For PLOS & BLOS)	EBL	WBL	SBL	NBL
	Left-Turn Signal Phasing	No Left-Turn / Prohib.	No Left-Turn / Prohib.	Fully Protected	No Left-Turn / Prohib.
	Left-Turn Volume	-	-	-	-
	Left-Turn Opposing Lanes	-	-	-	-
	Score	-	-	-	2.35
	PLOS	-	-	-	D
		D			
Target PLOS	C				
Bicycle	BLOS Inputs				
	Cycling Route Classification	Elsewhere			
	Cyclists Crossing the	North Leg	South Leg	East Leg	West Leg
	Type of Cycling Facility Across Leg	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
	Two-Way ADT (in Cyclist Travel Direction)	30,760		9,710	
	Floating Bike Lane or Right-Turn Lane Crossover Approaching the Crossing?	No	No	No	No
	Crossride Operation	-	-	-	-
	Target Crossride Setback Met?	-	-	-	-
	Right-Turn Vehicle Volume from Adjacent Roadway > 100 veh/h?	-	-	-	-
	Cyclist Left-Turn Operation	WBL	EBL	NBL	SBL
	Cyclist Left-Turn Treatment Type	No Left-Turn	No Left-Turn	No Left-Turn	General Purpose Dual Left-Turn Lanes
	Vehicle Lanes Crossed by Cyclists	-	-	-	-
	Score	50	50	Input PLOS First	10
	BLOS	D	D	-	F
E					
Target BLOS	C				
Transit	TLOS Inputs				
	Transit Facility	Select Transit Designation			
	Vehicles Travelling	Southbound	Northbound	Westbound	Eastbound
	Average Transit Delay (if available)				
	Example Transit Priority Treatment				
	TLOS	-	-	-	-
		-			
Target TLOS	-				
Auto	AutoLOS Inputs				
	Overall Intersection Volume to Capacity Ratio				
	Individual Movements V/C Ratios and Queue Lengths	See Separate Traffic Operations Table			
	AutoLOS	-			
	Target AutoLOS	E			

Multi-Modal Level of Service - Intersections Form

Project: Gloucester Costco Gas Bar Addition
Consultant: Kittelson Canada, LLC
Date: Oct 2025
Scenario: 2025 Existing Conditions

Intersection Name		Highway 417 NB Ramp / Innes Road			
OP Transect / Policy Area		Outer Urban or Suburban			
Pedestrian	PLOS Inputs				
	Pedestrians Crossing the	North Leg	South Leg	East Leg	West Leg
	Number of Travel Lanes Crossed	No Crosswalk	No Crosswalk	6	No Crosswalk
	Median Refuge (≥2.7m)	-	-	No	-
	Crosswalk Treatment	-	-	Std Transverse Markings	-
	Signal Cycle Length (sec)	160.0			
	Effective Walk Time (sec)	-	-	99.0	-
	Conflict with Right-Turn Vehicles (For PLOS & BLOS)	WBR	EBR	NBR	SBR
	Right-Turn Geometry	Conventional Right-Turn Channel	Conventional Right-Turn Channel	Conventional Right-Turn Channel	No Right-Turn / Prohib.
	Right-Turn Signal Phasing	-	-	-	-
	Right-Turn Volume	> 300 veh/h	> 150 to 300 veh/h	> 300 veh/h	-
	Right-Turn Effective Corner Radius	-	-	-	-
	Cross-street Posted Speed (km/h)	80 km/h		80 km/h	
	Conflict with Left-Turn Vehicles (For PLOS & BLOS)	EBL	WBL	SBL	NBL
	Left-Turn Signal Phasing	No Left-Turn / Prohib.	No Left-Turn / Prohib.	No Left-Turn / Prohib.	Fully Protected
	Left-Turn Volume	-	-	-	-
	Left-Turn Opposing Lanes	-	-	-	-
	Score	-	-	2.20	-
	PLOS	-	-	D	-
		D			
Target PLOS	C				
Bicycle	BLOS Inputs				
	Cycling Route Classification	Elsewhere			
	Cyclists Crossing the	North Leg	South Leg	East Leg	West Leg
	Type of Cycling Facility Across Leg	Mixed Traffic	Mixed Traffic	Mixed Traffic	Mixed Traffic
	Two-Way ADT (in Cyclist Travel Direction)	39,100		9,650	
	Floating Bike Lane or Right-Turn Lane Crossover Approaching the Crossing?	No	No	No	No
	Crossride Operation	-	-	-	-
	Target Crossride Setback Met?	-	-	-	-
	Right-Turn Vehicle Volume from Adjacent Roadway > 100 veh/h?	-	-	-	-
	Cyclist Left-Turn Operation	WBL	EBL	NBL	SBL
	Cyclist Left-Turn Treatment Type	No Left-Turn	No Left-Turn	General Purpose Dual Left-Turn Lanes	No Left-Turn
	Vehicle Lanes Crossed by Cyclists	-	-	-	-
	Score	50	60	0	100
	BLOS	D	D	F	B
		D			
	Target BLOS	C			
Transit	TLOS Inputs				
	Transit Facility	Select Transit Designation			
	Vehicles Travelling	Southbound	Northbound	Westbound	Eastbound
	Average Transit Delay (if available)				
	Example Transit Priority Treatment				
	TLOS	-	-	-	-
		-			
Target TLOS	-				
Auto	AutoLOS Inputs				
	Overall Intersection Volume to Capacity Ratio				
	Individual Movements V/C Ratios and Queue Lengths	See Separate Traffic Operations Table			
	AutoLOS	-			
	Target AutoLOS	E			

Multi-Modal Level of Service - Intersections Form

Project: Gloucester Costco Gas Bar Addition
Consultant: Kittelson Canada, LLC
Date: Oct 2025
Scenario: 2025 Existing Conditions

Intersection Name		Innes Road / Innes Crossing			
OP Transect / Policy Area		Outer Urban or Suburban			
Pedestrian	PLOS Inputs				
	Pedestrians Crossing the	North Leg	South Leg	East Leg	West Leg
	Number of Travel Lanes Crossed	4	1-3	7	8
	Median Refuge (≥2.7m)	No	No	No	No
	Crosswalk Treatment	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings
	Signal Cycle Length (sec)	160.0			
	Effective Walk Time (sec)	90.1	90.1	7.0	7.0
	Conflict with Right-Turn Vehicles (For PLOS & BLOS)	WBR	EBR	NBR	SBR
	Right-Turn Geometry	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel
	Right-Turn Signal Phasing	Permissive	Permissive	Permissive	Permissive
	Right-Turn Volume	≤ 150 veh/h	≤ 150 veh/h	≤ 150 veh/h	≤ 150 veh/h
	Right-Turn Effective Corner Radius	> 8m	> 8m	> 8m	> 8m
	Cross-street Posted Speed (km/h)	60 km/h		50 km/h	
	Conflict with Left-Turn Vehicles (For PLOS & BLOS)	EBL	WBL	SBL	NBL
	Left-Turn Signal Phasing	Fully Protected	Fully Protected	Perm or Prot+Perm	Perm or Prot+Perm
	Left-Turn Volume	-	-	≤ 50 veh/h	≤ 50 veh/h
	Left-Turn Opposing Lanes	-	-	-	-
	Score	3.85	4.45	1.60	1.00
PLOS	B	B	D	E	
	C				
Target PLOS	C				
Bicycle	BLOS Inputs				
	Cycling Route Classification	Elsewhere			
	Cyclists Crossing the	North Leg	South Leg	East Leg	West Leg
	Type of Cycling Facility Across Leg	Crossride	Crossride	Mixed Traffic	Mixed Traffic
	Two-Way ADT (in Cyclist Travel Direction)	40,980		2,640	
	Floating Bike Lane or Right-Turn Lane Crossover Approaching the Crossing?	No	No	No	No
	Crossride Operation	Unidirectional	Unidirectional	-	-
	Target Crossride Setback Met?	Yes	Yes	-	-
	Right-Turn Vehicle Volume from Adjacent Roadway > 100 veh/h?	-	-	-	-
	Cyclist Left-Turn Operation	WBL	EBL	NBL	SBL
	Cyclist Left-Turn Treatment Type	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane
	Vehicle Lanes Crossed by Cyclists	Two or More Lanes Crossed	Two or More Lanes Crossed	No Lane Crossed	One Lane Crossed
	Score	90	90	60	50
	BLOS	C	C	D	D
C					
Target BLOS	C				
Transit	TLOS Inputs				
	Transit Facility	Select Transit Designation			
	Vehicles Travelling	Southbound	Northbound	Westbound	Eastbound
	Average Transit Delay (if available)				
	Example Transit Priority Treatment				
	TLOS	-	-	-	-
		-			
Target TLOS	-				
Auto	AutoLOS Inputs				
	Overall Intersection Volume to Capacity Ratio				
	Individual Movements V/C Ratios and Queue Lengths	See Separate Traffic Operations Table			
	AutoLOS	-			
	Target AutoLOS	E			

Multi-Modal Level of Service - Intersections Form

Project: Gloucester Costco Gas Bar Addition
Consultant: Kittelson Canada, LLC
Date: Oct 2025
Scenario: 2025 Existing Conditions

Intersection Name		Innes Road / Cryville Rd			
OP Transect / Policy Area		Outer Urban or Suburban			
Pedestrian	PLOS Inputs				
	Pedestrians Crossing the	North Leg	South Leg	East Leg	West Leg
	Number of Travel Lanes Crossed	6	6	8	≥ 9
	Median Refuge (≥2.7m)	No	No	No	No
	Crosswalk Treatment	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings
	Signal Cycle Length (sec)	160.0			
	Effective Walk Time (sec)	61.8	61.8	7.1	7.1
	Conflict with Right-Turn Vehicles (For PLOS & BLOS)	WBR	EBR	NBR	SBR
	Right-Turn Geometry	Conventional Right-Turn Channel	Conventional Right-Turn Channel	Right-Turn With No Channel	Conventional Right-Turn Channel
	Right-Turn Signal Phasing	-	-	Permissive	-
	Right-Turn Volume	> 300 veh/h	≤ 150 veh/h	≤ 150 veh/h	≤ 150 veh/h
	Right-Turn Effective Corner Radius	-	-	> 8m	-
	Cross-street Posted Speed (km/h)	50 km/h		60 km/h	
	Conflict with Left-Turn Vehicles (For PLOS & BLOS)	EBL	WBL	SBL	NBL
	Left-Turn Signal Phasing	Fully Protected	Fully Protected	Fully Protected	Fully Protected
	Left-Turn Volume	-	-	-	-
	Left-Turn Opposing Lanes	-	-	-	-
	Score	1.90	2.05	0.85	0.55
PLOS	D	D	E	E	
	E				
Target PLOS	C				
Bicycle	BLOS Inputs				
	Cycling Route Classification	Elsewhere			
	Cyclists Crossing the	North Leg	South Leg	East Leg	West Leg
	Type of Cycling Facility Across Leg	Bike Lane Through Intersection	Bike Lane Through Intersection	Mixed Traffic	Bike Lane Through Intersection
	Two-Way ADT (in Cyclist Travel Direction)	42,350		5,740	
	Floating Bike Lane or Right-Turn Lane Crossover Approaching the Crossing?	No	Yes	No	Yes
	Crossride Operation	-	-	-	-
	Target Crossride Setback Met?	-	-	-	-
	Right-Turn Vehicle Volume from Adjacent Roadway > 100 veh/h?	-	-	-	-
	Cyclist Left-Turn Operation	WBL	EBL	NBL	SBL
	Cyclist Left-Turn Treatment Type	General Purpose Through-Left or Single Left-Turn Lane	Two-Stage Queue Box	General Purpose Dual Left-Turn Lanes	General Purpose Dual Left-Turn Lanes
	Vehicle Lanes Crossed by Cyclists	Two or More Lanes Crossed	-	-	-
	Score	25	55	30	25
	BLOS	E	D	E	E
D					
Target BLOS	C				
Transit	TLOS Inputs				
	Transit Facility	Mixed Traffic			
	Vehicles Travelling	Southbound	Northbound	Westbound	Eastbound
	Average Transit Delay (if available)	> 80 sec	Unavailable	Unavailable	Unavailable
	Example Transit Priority Treatment	-			
	TLOS	F	-	-	-
		F			
Target TLOS	E (D for frequent transit routes)				
Auto	AutoLOS Inputs				
	Overall Intersection Volume to Capacity Ratio				
	Individual Movements V/C Ratios and Queue Lengths	See Separate Traffic Operations Table			
	AutoLOS	-			
	Target AutoLOS	E			

Multi-Modal Level of Service - Intersections Form

Project: Gloucester Costco Gas Bar Addition
Consultant: Kittelson Canada, LLC
Date: Oct 2025
Scenario: 2025 Existing Conditions

Intersection Name		Innes Road / Stonehenge Crescent			
OP Transect / Policy Area		Outer Urban or Suburban			
Pedestrian	PLOS Inputs				
	Pedestrians Crossing the	North Leg	South Leg	East Leg	West Leg
	Number of Travel Lanes Crossed	1-3	1-3	7	7
	Median Refuge (≥2.7m)	No	No	No	No
	Crosswalk Treatment	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings	Std Transverse Markings
	Signal Cycle Length (sec)	160.0			
	Effective Walk Time (sec)	78.0	78.0	7.5	7.5
	Conflict with Right-Turn Vehicles (For PLOS & BLOS)	WBR	EBR	NBR	SBR
	Right-Turn Geometry	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel	Right-Turn With No Channel
	Right-Turn Signal Phasing	Permissive	Permissive	Permissive	Permissive
	Right-Turn Volume	≤ 150 veh/h	≤ 150 veh/h	≤ 150 veh/h	≤ 150 veh/h
	Right-Turn Effective Corner Radius	> 8m	> 8m	> 8m	> 8m
	Cross-street Posted Speed (km/h)	50 km/h		60 km/h	
	Conflict with Left-Turn Vehicles (For PLOS & BLOS)	EBL	WBL	SBL	NBL
	Left-Turn Signal Phasing	Fully Protected	Fully Protected	Perm or Prot+Perm	Perm or Prot+Perm
	Left-Turn Volume	-	-	≤ 50 veh/h	≤ 50 veh/h
	Left-Turn Opposing Lanes	-	-	-	-
	Score	4.45	4.45	1.45	1.45
PLOS	B	B	E	E	
	C				
Target PLOS	C				
Bicycle	BLOS Inputs				
	Cycling Route Classification	Elsewhere			
	Cyclists Crossing the	North Leg	South Leg	East Leg	West Leg
	Type of Cycling Facility Across Leg	Bike Lane Through Intersection	Crossride	Mixed Traffic	Mixed Traffic
	Two-Way ADT (in Cyclist Travel Direction)	45,940		1,280	
	Floating Bike Lane or Right-Turn Lane Crossover Approaching the Crossing?	No	No	No	No
	Crossride Operation	-	Unidirectional	-	-
	Target Crossride Setback Met?	-	Yes	-	-
	Right-Turn Vehicle Volume from Adjacent Roadway > 100 veh/h?	-	-	-	-
	Cyclist Left-Turn Operation	WBL	EBL	NBL	SBL
	Cyclist Left-Turn Treatment Type	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane	General Purpose Through-Left or Single Left-Turn Lane
	Vehicle Lanes Crossed by Cyclists	Two or More Lanes Crossed	Two or More Lanes Crossed	No Lane Crossed	No Lane Crossed
	Score	65	90	50	50
	BLOS	C	C	D	D
C					
Target BLOS	C				
Transit	TLOS Inputs				
	Transit Facility	Mixed Traffic			
	Vehicles Travelling	Southbound	Northbound	Westbound	Eastbound
	Average Transit Delay (if available)	Unavailable	Unavailable	11-20 sec	11-20 sec
	Example Transit Priority Treatment			-	-
	TLOS	-	-	B	B
		B			
Target TLOS	E (D for frequent transit routes)				
Auto	AutoLOS Inputs				
	Overall Intersection Volume to Capacity Ratio				
	Individual Movements V/C Ratios and Queue Lengths	See Separate Traffic Operations Table			
	AutoLOS	-			
	Target AutoLOS	E			

Appendix F
Year 2025 Existing Conditions Operational
Worksheets

Queues
1: Highway 417 SB Ramp & Innes

Gloucester Costco Business Centre Gas Bar Addition
2025 Existing Weekday AM Peak Hour



Lane Group	EBT	EBR	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	743	136	1840	420	358	633
v/c Ratio	0.29	0.13	0.68	0.33	0.81	0.42
Control Delay	5.1	0.9	6.8	1.2	81.7	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.1	0.9	6.8	1.2	81.7	0.9
Queue Length 50th (m)	30.7	0.0	67.0	5.5	57.4	0.0
Queue Length 95th (m)	38.9	4.6	86.1	6.7	74.7	0.0
Internal Link Dist (m)	248.5		391.3			
Turn Bay Length (m)		45.0		100.0	75.0	75.0
Base Capacity (vph)	2575	1021	2703	1274	491	1502
Starvation Cap Reductn	0	0	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	0.29	0.13	0.68	0.33	0.73	0.42
Intersection Summary						

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

1: Highway 417 SB Ramp & Innes

2025 Existing Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗				↘↘		↗
Traffic Volume (veh/h)	0	728	133	0	1803	412	0	0	0	351	0	620
Future Volume (veh/h)	0	728	133	0	1803	412	0	0	0	351	0	620
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	0	1716	1477	0	1786	1758				1772	0	1758
Adj Flow Rate, veh/h	0	743	0	0	1840	0				358	0	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98				0.98	0.98	0.98
Percent Heavy Veh, %	0	6	23	0	1	3				2	0	3
Cap, veh/h	0	2604		0	2711					411	0	
Arrive On Green	0.00	0.80	0.00	0.00	0.80	0.00				0.13	0.00	0.00
Sat Flow, veh/h	0	3346	1252	0	3483	1490				3274	0	1490
Grp Volume(v), veh/h	0	743	0	0	1840	0				358	0	0
Grp Sat Flow(s),veh/h/ln	0	1630	1252	0	1697	1490				1637	0	1490
Q Serve(g_s), s	0.0	9.5	0.0	0.0	38.1	0.0				17.2	0.0	0.0
Cycle Q Clear(g_c), s	0.0	9.5	0.0	0.0	38.1	0.0				17.2	0.0	0.0
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2604		0	2711					411	0	
V/C Ratio(X)	0.00	0.29		0.00	0.68					0.87	0.00	
Avail Cap(c_a), veh/h	0	2604		0	2711					489	0	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	4.2	0.0	0.0	7.1	0.0				68.7	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.0	1.4	0.0				13.9	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
%ile BackOfQ(95%),veh/ln	0.0	6.6	0.0	0.0	21.8	0.0				13.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	4.5	0.0	0.0	8.5	0.0				82.6	0.0	0.0
LnGrp LOS	A	A		A	A					F	A	
Approach Vol, veh/h		743			1840						358	
Approach Delay, s/veh		4.5			8.5						82.6	
Approach LOS		A			A						F	
Timer - Assigned Phs		2			6			8				
Phs Duration (G+Y+Rc), s		133.8			133.8			26.2				
Change Period (Y+Rc), s		* 6			* 6			6.1				
Max Green Setting (Gmax), s		* 1.2E2			* 1.2E2			23.9				
Max Q Clear Time (g_c+I1), s		11.5			40.1			19.2				
Green Ext Time (p_c), s		20.9			72.2			0.9				
Intersection Summary												
HCM 6th Ctrl Delay			16.5									
HCM 6th LOS			B									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Queues
2: Highway 417 NB Ramp & Innes

Gloucester Costco Business Centre Gas Bar Addition

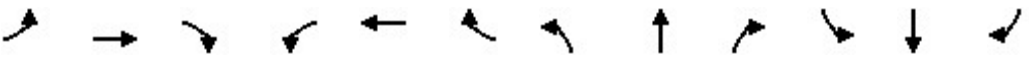
2025 Existing Weekday AM Peak Hour

	→	↘	←	↖	↙	↗
Lane Group	EBT	EBR	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	919	217	1915	1065	417	599
v/c Ratio	0.36	0.20	0.73	0.75	0.81	0.41
Control Delay	4.1	0.4	2.4	11.1	78.2	0.8
Queue Delay	0.0	0.0	0.2	1.5	0.0	0.0
Total Delay	4.1	0.4	2.6	12.6	78.2	0.8
Queue Length 50th (m)	27.0	0.0	9.3	52.5	66.8	0.0
Queue Length 95th (m)	33.1	m0.0	m12.8	m51.3	83.6	0.0
Internal Link Dist (m)	391.3		192.3			
Turn Bay Length (m)				180.0	100.0	75.0
Base Capacity (vph)	2581	1078	2606	1424	594	1473
Starvation Cap Reductn	0	0	123	191	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.20	0.77	0.86	0.70	0.41
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

2: Highway 417 NB Ramp & Innes

2025 Existing Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗	↘↘		↗			
Traffic Volume (veh/h)	0	873	206	0	1819	1012	396	0	569	0	0	0
Future Volume (veh/h)	0	873	206	0	1819	1012	396	0	569	0	0	0
Initial Q (Qb), veh	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			
Parking Bus, Adj	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				
Adj Sat Flow, veh/h/ln	0	1758	1617	0	1772	1786	1758	0	1730			
Adj Flow Rate, veh/h	0	919	0	0	1915	0	417	0	0			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	0	3	13	0	2	1	3	0	5			
Cap, veh/h	0	2602		0	2623		478	0				
Arrive On Green	0.00	0.78	0.00	0.00	1.00	0.00	0.15	0.00	0.00			
Sat Flow, veh/h	0	3428	1371	0	3455	1514	3248	0	1466			
Grp Volume(v), veh/h	0	919	0	0	1915	0	417	0	0			
Grp Sat Flow(s),veh/h/ln	0	1670	1371	0	1683	1514	1624	0	1466			
Q Serve(g_s), s	0.0	13.4	0.0	0.0	0.0	0.0	20.1	0.0	0.0			
Cycle Q Clear(g_c), s	0.0	13.4	0.0	0.0	0.0	0.0	20.1	0.0	0.0			
Prop In Lane	0.00		1.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2602		0	2623		478	0				
V/C Ratio(X)	0.00	0.35		0.00	0.73		0.87	0.00				
Avail Cap(c_a), veh/h	0	2602		0	2623		593	0				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	0.00	0.00	0.16	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	0.0	5.4	0.0	0.0	0.0	0.0	66.7	0.0	0.0			
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.0	0.3	0.0	11.4	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			
%ile BackOfQ(95%),veh/ln	0.0	9.2	0.0	0.0	0.2	0.0	14.5	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	5.8	0.0	0.0	0.3	0.0	78.2	0.0	0.0			
LnGrp LOS	A	A		A	A		E	A				
Approach Vol, veh/h		919			1915			417				
Approach Delay, s/veh		5.8			0.3			78.2				
Approach LOS		A			A			E				
Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		130.6		29.4		130.6						
Change Period (Y+Rc), s		* 6		* 5.8		* 6						
Max Green Setting (Gmax), s		* 1.2E2		* 29		* 1.2E2						
Max Q Clear Time (g_c+I1), s		15.4		22.1		2.0						
Green Ext Time (p_c), s		29.3		1.5		99.3						
Intersection Summary												
HCM 6th Ctrl Delay				11.8								
HCM 6th LOS				B								
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.												

Queues
3: Innes Crossing & Innes

Gloucester Costco Business Centre Gas Bar Addition

2025 Existing Weekday AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	149	1293	27	2848	49	95	38	3	113
v/c Ratio	1.66	0.44	0.34	1.00	0.05	0.28	0.12	0.01	0.26
Control Delay	385.4	11.6	94.2	16.5	0.1	45.2	48.7	46.0	14.5
Queue Delay	0.0	0.0	0.0	5.6	0.0	0.0	0.0	0.0	0.0
Total Delay	385.4	11.6	94.2	22.1	0.1	45.2	48.7	46.0	14.5
Queue Length 50th (m)	~69.7	76.6	8.6	~37.8	0.0	21.5	9.5	0.7	5.2
Queue Length 95th (m)	#117.3	84.6	m10.0	m#41.7	m0.0	38.6	19.9	3.7	21.8
Internal Link Dist (m)		192.3		193.0		122.5		129.2	
Turn Bay Length (m)	50.0		45.0		90.0		45.0		45.0
Base Capacity (vph)	90	2944	90	2846	905	345	307	443	437
Starvation Cap Reductn	0	0	0	54	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	1.66	0.44	0.30	1.02	0.05	0.28	0.12	0.01	0.26

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

3: Innes Crossing & Innes

2025 Existing Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 			 	
Traffic Volume (veh/h)	140	1210	6	25	2677	46	48	16	25	36	3	106
Future Volume (veh/h)	140	1210	6	25	2677	46	48	16	25	36	3	106
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	1800	1744	1800	1800	1786	1800	1660	1800	1744	1800	1800	1786
Adj Flow Rate, veh/h	149	1287	6	27	2848	49	51	17	27	38	3	113
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	4	0	0	1	0	10	0	4	0	0	1
Cap, veh/h	90	2980	14	37	2822	881	213	73	100	371	439	368
Arrive On Green	0.02	0.20	0.20	0.01	0.39	0.39	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	1714	4891	23	1714	4876	1521	732	298	409	1382	1800	1512
Grp Volume(v), veh/h	149	835	458	27	2848	49	95	0	0	38	3	113
Grp Sat Flow(s),veh/h/ln	1714	1587	1740	1714	1625	1521	1440	0	0	1382	1800	1512
Q Serve(g_s), s	8.4	36.8	36.8	2.5	92.6	3.2	6.5	0.0	0.0	0.0	0.2	9.8
Cycle Q Clear(g_c), s	8.4	36.8	36.8	2.5	92.6	3.2	8.3	0.0	0.0	4.1	0.2	9.8
Prop In Lane	1.00		0.01	1.00		1.00	0.54		0.28	1.00		1.00
Lane Grp Cap(c), veh/h	90	1934	1060	37	2822	881	386	0	0	371	439	368
V/C Ratio(X)	1.66	0.43	0.43	0.72	1.01	0.06	0.25	0.00	0.00	0.10	0.01	0.31
Avail Cap(c_a), veh/h	90	1934	1060	90	2822	881	386	0	0	371	439	368
HCM Platoon Ratio	0.33	0.33	0.33	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	0.17	0.17	0.17	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	78.6	39.7	39.7	78.3	49.0	21.6	48.8	0.0	0.0	47.3	45.8	49.4
Incr Delay (d2), s/veh	336.2	0.7	1.2	4.4	9.4	0.0	1.5	0.0	0.0	0.6	0.0	2.1
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(95%),veh/ln	20.2	22.5	24.6	1.9	47.5	2.1	6.2	0.0	0.0	2.4	0.2	7.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	414.8	40.3	40.9	82.8	58.4	21.6	50.3	0.0	0.0	47.9	45.9	51.6
LnGrp LOS	F	D	D	F	F	C	D	A	A	D	D	D
Approach Vol, veh/h		1442			2924			95			154	
Approach Delay, s/veh		79.2			58.0			50.3			50.6	
Approach LOS		E			E			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.1	103.9		46.0	15.0	99.0		46.0				
Change Period (Y+Rc), s	* 6.6	6.4		7.0	* 6.6	6.4		7.0				
Max Green Setting (Gmax), s	* 8.4	92.6		39.0	* 8.4	92.6		39.0				
Max Q Clear Time (g_c+I1), s	4.5	38.8		10.3	10.4	94.6		11.8				
Green Ext Time (p_c), s	0.0	34.4		1.4	0.0	0.0		0.9				

Intersection Summary

HCM 6th Ctrl Delay	64.2
HCM 6th LOS	E

Notes

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

Queues
4: Cryville & Innes

Gloucester Costco Business Centre Gas Bar Addition

2025 Existing Weekday AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	113	1039	145	51	2480	494	174	72	42	117	30	150
v/c Ratio	1.00	0.41	0.18	0.53	1.00	0.58	1.04	0.20	0.11	0.69	0.08	0.37
Control Delay	175.2	11.0	0.5	93.8	45.4	11.6	151.2	53.5	0.5	94.9	51.2	16.2
Queue Delay	0.0	0.0	0.0	0.0	33.7	1.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	175.2	11.0	0.5	93.8	79.1	12.7	151.2	53.5	0.5	94.9	51.2	16.2
Queue Length 50th (m)	38.0	23.4	0.0	15.1	283.5	75.8	~30.6	19.0	0.0	19.2	7.7	7.8
Queue Length 95th (m)	#81.1	26.1	1.0	m20.6	#323.8	77.5	#56.0	33.8	0.0	#32.4	17.4	28.3
Internal Link Dist (m)		193.0			155.0			42.3			210.4	
Turn Bay Length (m)	70.0		85.0	45.0		60.0	55.0		45.0	90.0		100.0
Base Capacity (vph)	113	2530	811	112	2484	847	167	365	393	170	387	404
Starvation Cap Reductn	0	0	0	0	209	161	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	93	0	0	0	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.00	0.41	0.18	0.46	1.09	0.72	1.04	0.20	0.11	0.69	0.08	0.37

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

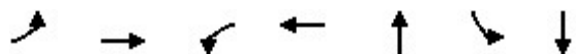
4: Cryville & Innes

2025 Existing Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 			 		
Traffic Volume (veh/h)	111	1018	142	50	2430	484	171	71	41	115	29	147
Future Volume (veh/h)	111	1018	142	50	2430	484	171	71	41	115	29	147
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		0.99	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	1758	1744	1716	1744	1786	1772	1730	1716	1730	1758	1800	1744
Adj Flow Rate, veh/h	113	1039	0	51	2480	0	174	72	42	117	30	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	4	6	4	1	2	5	6	5	3	0	4
Cap, veh/h	113	2540		65	2462		168	366	310	171	384	
Arrive On Green	0.02	0.18	0.00	0.01	0.17	0.00	0.05	0.21	0.21	0.05	0.21	0.00
Sat Flow, veh/h	1674	4761	1454	1661	4876	1502	3196	1716	1454	3248	1800	1478
Grp Volume(v), veh/h	113	1039	0	51	2480	0	174	72	42	117	30	0
Grp Sat Flow(s),veh/h/ln	1674	1587	1454	1661	1625	1502	1598	1716	1454	1624	1800	1478
Q Serve(g_s), s	10.8	31.0	0.0	4.9	80.8	0.0	8.4	5.5	3.0	5.7	2.1	0.0
Cycle Q Clear(g_c), s	10.8	31.0	0.0	4.9	80.8	0.0	8.4	5.5	3.0	5.7	2.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	113	2540		65	2462		168	366	310	171	384	
V/C Ratio(X)	1.00	0.41		0.79	1.01		1.04	0.20	0.14	0.69	0.08	
Avail Cap(c_a), veh/h	113	2540		112	2462		168	366	310	171	384	
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.00	0.57	0.57	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	78.2	43.5	0.0	78.3	66.7	0.0	75.8	51.7	33.5	74.5	50.4	0.0
Incr Delay (d2), s/veh	80.7	0.4	0.0	11.5	15.5	0.0	79.6	1.2	0.9	10.9	0.4	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(95%),veh/ln	11.8	19.4	0.0	4.4	47.6	0.0	9.4	4.8	2.3	4.9	1.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	159.0	44.0	0.0	89.8	82.1	0.0	155.4	52.9	34.4	85.4	50.8	0.0
LnGrp LOS	F	D		F	F		F	D	C	F	D	
Approach Vol, veh/h		1152			2531			288			147	
Approach Delay, s/veh		55.2			82.3			112.1			78.3	
Approach LOS		E			F			F			E	
Timer - Assigned Phs												
Phs Duration (G+Y+Rc), s	12.4	91.6	15.0	41.0	17.0	87.0	15.0	41.0				
Change Period (Y+Rc), s	* 6.2	* 6.2	* 6.6	6.9	* 6.2	* 6.2	* 6.6	6.9				
Max Green Setting (Gmax), s	* 11	* 81	* 8.4	34.1	* 11	* 81	* 8.4	34.1				
Max Q Clear Time (g_c+I1), s	6.9	33.0	7.7	7.5	12.8	82.8	10.4	4.1				
Green Ext Time (p_c), s	0.0	25.5	0.0	1.2	0.0	0.0	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay				76.7								
HCM 6th LOS				E								
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Queues
5: Stonehenge Crescent & Innes

Gloucester Costco Business Centre Gas Bar Addition
2025 Existing Weekday AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	17	1124	64	3009	35	14	84
v/c Ratio	0.23	0.31	0.53	0.75	0.36	0.22	0.56
Control Delay	72.9	2.3	86.9	10.3	40.4	79.6	30.0
Queue Delay	0.0	0.0	0.0	7.1	0.0	0.0	0.0
Total Delay	72.9	2.3	86.9	17.3	40.4	79.6	30.0
Queue Length 50th (m)	5.8	9.4	20.0	167.4	2.5	4.4	1.3
Queue Length 95th (m)	m13.4	10.8	35.3	227.8	14.2	12.1	18.7
Internal Link Dist (m)		155.0		158.8	65.7		136.4
Turn Bay Length (m)	40.0		45.0			25.0	
Base Capacity (vph)	130	3681	142	3997	349	295	398
Starvation Cap Reductn	0	572	0	0	0	0	0
Spillback Cap Reductn	0	0	0	967	0	0	15
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.36	0.45	0.99	0.10	0.05	0.22

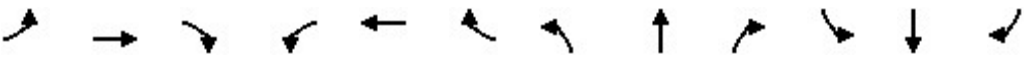
Intersection Summary

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

5: Stonehenge Crescent & Innes

2025 Existing Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰↰↰		↰	↰↰↰			↰↰		↰	↰	
Traffic Volume (veh/h)	16	1070	9	61	2881	8	6	2	26	13	4	77
Future Volume (veh/h)	16	1070	9	61	2881	8	6	2	26	13	4	77
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	0.99		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	1716	1744	1337	1772	1786	1800	1800	1800	1800	1800	1800	1786
Adj Flow Rate, veh/h	17	1115	9	64	3001	8	6	2	27	14	4	80
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	6	4	33	2	1	0	0	0	0	0	0	1
Cap, veh/h	27	3540	29	80	3804	10	39	21	114	159	7	148
Arrive On Green	0.01	0.49	0.49	0.05	0.76	0.76	0.10	0.10	0.10	0.10	0.10	0.10
Sat Flow, veh/h	1634	4871	39	1688	5021	13	124	207	1114	1388	72	1443
Grp Volume(v), veh/h	17	726	398	64	1942	1067	35	0	0	14	0	84
Grp Sat Flow(s),veh/h/ln	1634	1587	1737	1688	1625	1783	1444	0	0	1388	0	1515
Q Serve(g_s), s	1.7	22.2	22.2	6.0	57.5	57.7	0.0	0.0	0.0	0.0	0.0	8.4
Cycle Q Clear(g_c), s	1.7	22.2	22.2	6.0	57.5	57.7	8.4	0.0	0.0	2.4	0.0	8.4
Prop In Lane	1.00		0.02	1.00		0.01	0.17		0.77	1.00		0.95
Lane Grp Cap(c), veh/h	27	2307	1262	80	2463	1351	174	0	0	159	0	155
V/C Ratio(X)	0.63	0.31	0.32	0.80	0.79	0.79	0.20	0.00	0.00	0.09	0.00	0.54
Avail Cap(c_a), veh/h	131	2307	1262	135	2463	1351	351	0	0	325	0	336
HCM Platoon Ratio	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	78.6	16.9	16.9	75.4	11.7	11.7	65.9	0.0	0.0	65.5	0.0	68.2
Incr Delay (d2), s/veh	19.7	0.3	0.6	16.2	2.6	4.8	0.6	0.0	0.0	0.2	0.0	2.9
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(95%),veh/ln	1.6	14.3	15.5	5.5	31.0	34.7	2.5	0.0	0.0	1.0	0.0	6.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	98.3	17.2	17.5	91.6	14.3	16.4	66.5	0.0	0.0	65.7	0.0	71.1
LnGrp LOS	F	B	B	F	B	B	E	A	A	E	A	E
Approach Vol, veh/h	1141			3073			35			98		
Approach Delay, s/veh	18.5			16.7			66.5			70.4		
Approach LOS	B			B			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.8	122.3		23.9	8.9	127.2		23.9				
Change Period (Y+Rc), s	* 6.2	6.0		7.5	* 6.2	6.0		7.5				
Max Green Setting (Gmax), s	* 13	92.0		35.5	* 13	92.0		35.5				
Max Q Clear Time (g_c+I1), s	8.0	24.2		10.4	3.7	59.7		10.4				
Green Ext Time (p_c), s	0.1	32.7		0.3	0.0	32.2		1.3				

Intersection Summary

HCM 6th Ctrl Delay 18.8

HCM 6th LOS B

Notes

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

Intersection												
Int Delay, s/veh	3.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	0	136	0	149	16	49	97	75
Future Vol, veh/h	0	0	0	0	0	136	0	149	16	49	97	75
Conflicting Peds, #/hr	0	0	4	4	0	0	0	0	2	2	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	79	79	79	79	79	79	79	79	79
Heavy Vehicles, %	0	0	0	0	0	4	0	7	6	2	7	4
Mvmt Flow	0	0	0	0	0	172	0	189	20	62	123	95

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	- 107	- 0 0 211 0 0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	- 6.96	- - 4.13 - -
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	- 3.338	- - 2.219 - -
Pot Cap-1 Maneuver	0	0 921	0 - - 1358 - 0
Stage 1	0	0 -	0 - - - - 0
Stage 2	0	0 -	0 - - - - 0
Platoon blocked, %			- - -
Mov Cap-1 Maneuver	-	0 919	- - - 1355 - -
Mov Cap-2 Maneuver	-	0 -	- - - - -
Stage 1	-	0 -	- - - - -
Stage 2	-	0 -	- - - - -

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	2.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 919	1355	-
HCM Lane V/C Ratio	-	- 0.187	0.046	-
HCM Control Delay (s)	-	- 9.8	7.8	-
HCM Lane LOS	-	- A	A	-
HCM 95th %tile Q(veh)	-	- 0.7	0.1	-

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	163	89	0
Future Vol, veh/h	0	0	0	163	89	0
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	79	79	79	79	79	79
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	0	206	113	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	319	113	113	0	-	0
Stage 1	113	-	-	-	-	-
Stage 2	206	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	678	945	1489	-	-	-
Stage 1	917	-	-	-	-	-
Stage 2	833	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	678	945	1489	-	-	-
Mov Cap-2 Maneuver	678	-	-	-	-	-
Stage 1	917	-	-	-	-	-
Stage 2	833	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1489	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	0	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	-	-	-	

Intersection						
Int Delay, s/veh	4.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	113	0	3	49	22	66
Future Vol, veh/h	113	0	3	49	22	66
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	81	81	81	81	81	81
Heavy Vehicles, %	4	0	0	12	27	0
Mvmt Flow	140	0	4	60	27	81
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	136	68	108	0	-	0
Stage 1	68	-	-	-	-	-
Stage 2	68	-	-	-	-	-
Critical Hdwy	6.44	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	853	1001	1495	-	-	-
Stage 1	950	-	-	-	-	-
Stage 2	950	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	850	1001	1495	-	-	-
Mov Cap-2 Maneuver	850	-	-	-	-	-
Stage 1	947	-	-	-	-	-
Stage 2	950	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.1	0.4		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1495	-	850	-	-	
HCM Lane V/C Ratio	0.002	-	0.164	-	-	
HCM Control Delay (s)	7.4	0	10.1	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.6	-	-	

Queues
1: Highway 417 SB Ramp & Innes

Gloucester Costco Business Centre Gas Bar Addition

2025 Existing Weekday PM Peak Hour

	→	↘	←	↖	↘	↖
Lane Group	EBT	EBR	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	1326	359	790	499	915	276
v/c Ratio	0.64	0.36	0.40	0.45	0.89	0.21
Control Delay	20.0	6.5	7.3	1.9	57.7	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	6.5	7.3	1.9	57.7	0.4
Queue Length 50th (m)	120.5	16.6	28.3	3.6	123.3	0.0
Queue Length 95th (m)	151.3	36.2	35.4	6.7	144.9	0.0
Internal Link Dist (m)	248.5		391.3			
Turn Bay Length (m)		45.0		100.0	75.0	75.0
Base Capacity (vph)	2078	997	1999	1108	1123	1311
Starvation Cap Reductn	0	0	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	0.64	0.36	0.40	0.45	0.81	0.21
Intersection Summary						

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

1: Highway 417 SB Ramp & Innes

2025 Existing Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗				↘↘		↗
Traffic Volume (veh/h)	0	1286	348	0	766	484	0	0	0	888	0	268
Future Volume (veh/h)	0	1286	348	0	766	484	0	0	0	888	0	268
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	0	1786	1758	0	1730	1758				1800	0	1547
Adj Flow Rate, veh/h	0	1326	0	0	790	0				915	0	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	1	3	0	5	3				0	0	18
Cap, veh/h	0	2067		0	2002					1013	0	
Arrive On Green	0.00	0.61	0.00	0.00	0.61	0.00				0.30	0.00	0.00
Sat Flow, veh/h	0	3483	1490	0	3373	1490				3326	0	1311
Grp Volume(v), veh/h	0	1326	0	0	790	0				915	0	0
Grp Sat Flow(s),veh/h/ln	0	1697	1490	0	1643	1490				1663	0	1311
Q Serve(g_s), s	0.0	35.1	0.0	0.0	17.3	0.0				37.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	35.1	0.0	0.0	17.3	0.0				37.0	0.0	0.0
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2067		0	2002					1013	0	
V/C Ratio(X)	0.00	0.64		0.00	0.39					0.90	0.00	
Avail Cap(c_a), veh/h	0	2067		0	2002					1114	0	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	17.6	0.0	0.0	14.1	0.0				46.7	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.5	0.0	0.0	0.6	0.0				9.8	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
%ile BackOfQ(95%),veh/ln	0.0	21.7	0.0	0.0	11.7	0.0				24.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	19.1	0.0	0.0	14.7	0.0				56.5	0.0	0.0
LnGrp LOS	A	B		A	B					E	A	
Approach Vol, veh/h		1326			790						915	
Approach Delay, s/veh		19.1			14.7						56.5	
Approach LOS		B			B						E	
Timer - Assigned Phs		2			6			8				
Phs Duration (G+Y+Rc), s		91.3			91.3			48.7				
Change Period (Y+Rc), s		* 6			* 6			6.1				
Max Green Setting (Gmax), s		* 81			* 81			46.9				
Max Q Clear Time (g_c+I1), s		37.1			19.3			39.0				
Green Ext Time (p_c), s		32.3			20.6			3.7				
Intersection Summary												
HCM 6th Ctrl Delay			29.2									
HCM 6th LOS			C									

Notes

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

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

Queues
2: Highway 417 NB Ramp & Innes

Gloucester Costco Business Centre Gas Bar Addition

2025 Existing Weekday PM Peak Hour

	→	↘	←	↖	↙	↗
Lane Group	EBT	EBR	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	1860	336	1102	664	161	644
v/c Ratio	0.66	0.26	0.40	0.48	0.60	0.43
Control Delay	5.8	0.7	0.6	3.8	69.8	0.9
Queue Delay	0.1	0.0	0.1	0.2	0.0	0.0
Total Delay	5.8	0.7	0.7	4.0	69.8	0.9
Queue Length 50th (m)	121.8	2.3	2.9	21.2	22.4	0.0
Queue Length 95th (m)	125.8	m4.6	4.1	165.7	33.2	0.0
Internal Link Dist (m)	391.3		192.3			
Turn Bay Length (m)				180.0	100.0	75.0
Base Capacity (vph)	2837	1276	2781	1376	587	1513
Starvation Cap Reductn	0	0	430	192	0	0
Spillback Cap Reductn	111	0	0	0	0	48
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.26	0.47	0.56	0.27	0.44
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

2: Highway 417 NB Ramp & Innes

2025 Existing Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗	↗↗		↗			
Traffic Volume (veh/h)	0	1841	333	0	1091	657	159	0	638	0	0	0
Future Volume (veh/h)	0	1841	333	0	1091	657	159	0	638	0	0	0
Initial Q (Qb), veh	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			
Parking Bus, Adj	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				
Adj Sat Flow, veh/h/ln	0	1800	1772	0	1772	1786	1533	0	1786			
Adj Flow Rate, veh/h	0	1860	0	0	1102	0	161	0	0			
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99			
Percent Heavy Veh, %	0	0	2	0	2	1	19	0	1			
Cap, veh/h	0	2872		0	2827		215	0				
Arrive On Green	0.00	0.84	0.00	0.00	1.00	0.00	0.08	0.00	0.00			
Sat Flow, veh/h	0	3510	1502	0	3455	1514	2833	0	1514			
Grp Volume(v), veh/h	0	1860	0	0	1102	0	161	0	0			
Grp Sat Flow(s),veh/h/ln	0	1710	1502	0	1683	1514	1416	0	1514			
Q Serve(g_s), s	0.0	26.8	0.0	0.0	0.0	0.0	7.8	0.0	0.0			
Cycle Q Clear(g_c), s	0.0	26.8	0.0	0.0	0.0	0.0	7.8	0.0	0.0			
Prop In Lane	0.00		1.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2872		0	2827		215	0				
V/C Ratio(X)	0.00	0.65		0.00	0.39		0.75	0.00				
Avail Cap(c_a), veh/h	0	2872		0	2827		591	0				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	0.00	0.00	0.75	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	0.0	3.9	0.0	0.0	0.0	0.0	63.4	0.0	0.0			
Incr Delay (d2), s/veh	0.0	1.1	0.0	0.0	0.3	0.0	5.1	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			
%ile BackOfQ(95%),veh/ln	0.0	15.2	0.0	0.0	0.2	0.0	5.6	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	5.1	0.0	0.0	0.3	0.0	68.5	0.0	0.0			
LnGrp LOS	A	A		A	A		E	A				
Approach Vol, veh/h		1860			1102			161				
Approach Delay, s/veh		5.1			0.3			68.5				
Approach LOS		A			A			E				
Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		123.6		16.4		123.6						
Change Period (Y+Rc), s		* 6		* 5.8		* 6						
Max Green Setting (Gmax), s		* 99		* 29		* 99						
Max Q Clear Time (g_c+I1), s		28.8		9.8		2.0						
Green Ext Time (p_c), s		62.2		0.9		39.6						
Intersection Summary												
HCM 6th Ctrl Delay			6.7									
HCM 6th LOS			A									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.												

Queues
3: Innes Crossing & Innes

Gloucester Costco Business Centre Gas Bar Addition

2025 Existing Weekday PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	122	2296	20	1554	68	92	86	14	169
v/c Ratio	0.82	0.83	0.24	0.65	0.09	0.22	0.24	0.03	0.31
Control Delay	110.7	20.1	81.2	7.7	0.9	33.2	41.3	37.1	6.9
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	110.7	20.3	81.2	7.7	0.9	33.2	41.3	37.1	6.9
Queue Length 50th (m)	35.3	158.7	5.5	32.4	0.3	15.9	18.5	2.8	0.0
Queue Length 95th (m)	m#65.4	215.8	m8.9	38.5	m1.1	30.8	33.3	8.4	16.9
Internal Link Dist (m)		192.3		193.0		122.5		129.2	
Turn Bay Length (m)	50.0		45.0		90.0		45.0		45.0
Base Capacity (vph)	153	2761	139	2399	787	414	359	507	546
Starvation Cap Reductn	0	78	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	0.80	0.86	0.14	0.65	0.09	0.22	0.24	0.03	0.31

Intersection Summary

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

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

3: Innes Crossing & Innes

2025 Existing Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 			 	
Traffic Volume (veh/h)	121	2266	7	20	1538	67	43	19	30	85	14	167
Future Volume (veh/h)	121	2266	7	20	1538	67	43	19	30	85	14	167
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		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	1800	1786	1603	1660	1772	1800	1730	1800	1758	1800	1800	1800
Adj Flow Rate, veh/h	122	2289	7	20	1554	68	43	19	30	86	14	169
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	0	1	14	10	2	0	5	0	3	0	0	0
Cap, veh/h	144	2806	9	31	2393	749	210	95	129	427	501	424
Arrive On Green	0.08	0.56	0.56	0.02	0.49	0.49	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1714	5018	15	1581	4837	1515	617	339	463	1374	1800	1520
Grp Volume(v), veh/h	122	1482	814	20	1554	68	92	0	0	86	14	169
Grp Sat Flow(s),veh/h/ln	1714	1625	1783	1581	1612	1515	1419	0	0	1374	1800	1520
Q Serve(g_s), s	9.8	51.7	51.8	1.8	33.5	3.3	4.3	0.0	0.0	0.9	0.8	12.6
Cycle Q Clear(g_c), s	9.8	51.7	51.8	1.8	33.5	3.3	6.6	0.0	0.0	7.5	0.8	12.6
Prop In Lane	1.00		0.01	1.00		1.00	0.47		0.33	1.00		1.00
Lane Grp Cap(c), veh/h	144	1818	997	31	2393	749	433	0	0	427	501	424
V/C Ratio(X)	0.85	0.82	0.82	0.66	0.65	0.09	0.21	0.00	0.00	0.20	0.03	0.40
Avail Cap(c_a), veh/h	152	1818	997	140	2393	749	433	0	0	427	501	424
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)	0.77	0.77	0.77	0.74	0.74	0.74	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	63.2	25.0	25.0	68.2	26.3	18.7	38.7	0.0	0.0	39.2	36.7	41.0
Incr Delay (d2), s/veh	26.7	3.2	5.8	16.2	1.0	0.2	1.1	0.0	0.0	1.1	0.1	2.8
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(95%),veh/ln	8.9	28.8	32.1	1.6	19.3	2.4	5.0	0.0	0.0	4.7	0.7	9.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	90.0	28.2	30.8	84.4	27.4	18.9	39.8	0.0	0.0	40.2	36.8	43.8
LnGrp LOS	F	C	C	F	C	B	D	A	A	D	D	D
Approach Vol, veh/h		2418			1642			92			269	
Approach Delay, s/veh		32.2			27.7			39.8			42.3	
Approach LOS		C			C			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.3	84.7		46.0	18.3	75.7		46.0				
Change Period (Y+Rc), s	* 6.6	6.4		7.0	* 6.6	6.4		7.0				
Max Green Setting (Gmax), s	* 12	68.6		39.0	* 12	68.6		39.0				
Max Q Clear Time (g_c+I1), s	3.8	53.8		8.6	11.8	35.5		14.6				
Green Ext Time (p_c), s	0.0	14.6		1.4	0.0	28.2		1.7				

Intersection Summary

HCM 6th Ctrl Delay	31.3
HCM 6th LOS	C

Notes

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

Queues
4: Cryville & Innes

Gloucester Costco Business Centre Gas Bar Addition

2025 Existing Weekday PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	79	2097	254	96	1255	214	216	58	120	531	118	187
v/c Ratio	0.66	1.14	0.39	0.76	0.69	0.32	0.52	0.13	0.26	1.29	0.27	0.38
Control Delay	98.9	100.8	11.6	110.8	31.6	5.0	62.3	42.4	7.6	194.4	44.8	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	98.9	100.8	11.6	110.8	31.7	5.0	62.3	42.4	7.6	194.4	44.8	9.2
Queue Length 50th (m)	23.3	~244.2	12.9	22.4	107.8	15.1	29.2	12.6	0.0	~96.1	26.6	2.1
Queue Length 95th (m)	m28.7	#273.6	m25.7	#55.3	125.4	8.0	42.5	24.7	14.3	#131.6	44.2	21.5
Internal Link Dist (m)		193.0			155.0			42.3			210.4	
Turn Bay Length (m)	70.0		85.0	45.0		60.0	55.0		45.0	90.0		100.0
Base Capacity (vph)	129	1836	647	133	1831	659	416	443	463	412	443	498
Starvation Cap Reductn	0	0	0	0	74	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	1.14	0.39	0.72	0.71	0.32	0.52	0.13	0.26	1.29	0.27	0.38

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

4: Cryville & Innes

2025 Existing Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 			 		
Traffic Volume (veh/h)	77	2055	249	94	1230	210	212	57	118	520	116	183
Future Volume (veh/h)	77	2055	249	94	1230	210	212	57	118	520	116	183
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		0.99	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	1758	1786	1786	1800	1772	1772	1800	1800	1800	1786	1800	1772
Adj Flow Rate, veh/h	79	2097	0	96	1255	0	216	58	120	531	118	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	1	1	0	2	2	0	0	0	1	0	2
Cap, veh/h	98	1846		118	1881		413	438	368	410	438	
Arrive On Green	0.08	0.50	0.00	0.02	0.13	0.00	0.12	0.24	0.24	0.12	0.24	0.00
Sat Flow, veh/h	1674	4876	1514	1714	4837	1502	3326	1800	1512	3300	1800	1502
Grp Volume(v), veh/h	79	2097	0	96	1255	0	216	58	120	531	118	0
Grp Sat Flow(s),veh/h/ln	1674	1625	1514	1714	1612	1502	1663	1800	1512	1650	1800	1502
Q Serve(g_s), s	6.5	53.0	0.0	7.8	34.6	0.0	8.5	3.5	7.3	17.4	7.4	0.0
Cycle Q Clear(g_c), s	6.5	53.0	0.0	7.8	34.6	0.0	8.5	3.5	7.3	17.4	7.4	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	98	1846		118	1881		413	438	368	410	438	
V/C Ratio(X)	0.81	1.14		0.82	0.67		0.52	0.13	0.33	1.29	0.27	
Avail Cap(c_a), veh/h	129	1846		132	1881		413	438	368	410	438	
HCM Platoon Ratio	1.33	1.33	1.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.48	0.48	0.00	0.91	0.91	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	63.8	34.8	0.0	67.5	52.4	0.0	57.4	41.4	27.8	61.3	42.9	0.0
Incr Delay (d2), s/veh	12.8	65.0	0.0	26.7	1.7	0.0	1.2	0.6	2.3	149.7	1.5	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(95%),veh/ln	5.2	42.7	0.0	7.9	21.8	0.0	7.0	3.2	5.7	25.3	6.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	76.6	99.7	0.0	94.2	54.1	0.0	58.6	42.0	30.1	211.0	44.4	0.0
LnGrp LOS	E	F		F	D		E	D	C	F	D	
Approach Vol, veh/h		2176			1351			394			649	
Approach Delay, s/veh		98.9			57.0			47.5			180.7	
Approach LOS		F			E			D			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.8	59.2	24.0	41.0	14.4	60.6	24.0	41.0				
Change Period (Y+Rc), s	* 6.2	* 6.2	* 6.6	6.9	* 6.2	* 6.2	* 6.6	6.9				
Max Green Setting (Gmax), s	* 11	* 52	* 17	34.1	* 11	* 52	* 17	34.1				
Max Q Clear Time (g_c+I1), s	9.8	55.0	19.4	9.3	8.5	36.6	10.5	9.4				
Green Ext Time (p_c), s	0.0	0.0	0.0	1.5	0.1	12.6	0.6	1.6				

Intersection Summary

HCM 6th Ctrl Delay	93.7
HCM 6th LOS	F

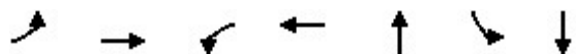
Notes

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

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

Queues
5: Stonehenge Crescent & Innes

Gloucester Costco Business Centre Gas Bar Addition
2025 Existing Weekday PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	64	2652	58	1510	93	19	61
v/c Ratio	0.49	0.73	0.47	0.42	0.61	0.28	0.41
Control Delay	73.4	4.8	73.9	8.5	40.7	70.8	25.0
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	73.4	5.2	73.9	8.5	40.7	70.8	25.0
Queue Length 50th (m)	18.9	26.8	15.7	55.3	8.1	5.1	1.3
Queue Length 95th (m)	m15.7	m51.6	29.8	82.6	25.4	13.3	15.0
Internal Link Dist (m)		155.0		158.8	65.7		136.4
Turn Bay Length (m)	40.0		45.0			25.0	
Base Capacity (vph)	136	3642	131	3580	418	268	425
Starvation Cap Reductn	0	446	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.83	0.44	0.42	0.22	0.07	0.14

Intersection Summary

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

5: Stonehenge Crescent & Innes

2025 Existing Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 				
Traffic Volume (veh/h)	63	2592	7	57	1459	21	20	10	62	19	5	55
Future Volume (veh/h)	63	2592	7	57	1459	21	20	10	62	19	5	55
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	0.98		0.98	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	1800	1786	1800	1800	1772	1800	1730	1800	1800	1800	1800	1772
Adj Flow Rate, veh/h	64	2645	7	58	1489	21	20	10	63	19	5	56
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	1	0	0	2	0	5	0	0	0	0	2
Cap, veh/h	81	3470	9	74	3376	48	57	36	129	196	16	174
Arrive On Green	0.05	0.69	0.69	0.04	0.69	0.69	0.13	0.13	0.13	0.13	0.13	0.13
Sat Flow, veh/h	1714	5021	13	1714	4914	69	203	288	1031	1330	124	1393
Grp Volume(v), veh/h	64	1712	940	58	977	533	93	0	0	19	0	61
Grp Sat Flow(s),veh/h/ln	1714	1625	1783	1714	1612	1759	1522	0	0	1330	0	1517
Q Serve(g_s), s	5.2	48.1	48.2	4.7	19.1	19.1	1.3	0.0	0.0	0.0	0.0	5.1
Cycle Q Clear(g_c), s	5.2	48.1	48.2	4.7	19.1	19.1	7.7	0.0	0.0	2.5	0.0	5.1
Prop In Lane	1.00		0.01	1.00		0.04	0.22		0.68	1.00		0.92
Lane Grp Cap(c), veh/h	81	2246	1233	74	2215	1208	222	0	0	196	0	190
V/C Ratio(X)	0.79	0.76	0.76	0.79	0.44	0.44	0.42	0.00	0.00	0.10	0.00	0.32
Avail Cap(c_a), veh/h	108	2246	1233	108	2215	1208	413	0	0	367	0	385
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)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	66.0	14.1	14.1	66.4	9.8	9.8	56.9	0.0	0.0	54.7	0.0	55.8
Incr Delay (d2), s/veh	2.7	0.2	0.4	20.6	0.6	1.2	1.3	0.0	0.0	0.2	0.0	1.0
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(95%),veh/ln	3.2	21.1	23.2	4.6	12.2	13.3	6.0	0.0	0.0	1.2	0.0	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.7	14.3	14.5	86.9	10.5	11.0	58.2	0.0	0.0	54.9	0.0	56.8
LnGrp LOS	E	B	B	F	B	B	E	A	A	D	A	E
Approach Vol, veh/h	2716			1568			93			80		
Approach Delay, s/veh	15.7			13.5			58.2			56.3		
Approach LOS	B			B			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.2	102.8		25.0	12.8	102.2		25.0				
Change Period (Y+Rc), s	* 6.2	6.0		7.5	* 6.2	6.0		7.5				
Max Green Setting (Gmax), s	* 8.8	76.0		35.5	* 8.8	76.0		35.5				
Max Q Clear Time (g_c+I1), s	6.7	50.2		9.7	7.2	21.1		7.1				
Green Ext Time (p_c), s	0.0	25.6		1.3	0.0	40.9		1.0				

Intersection Summary

HCM 6th Ctrl Delay	16.5
HCM 6th LOS	B

Notes

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

Intersection												
Int Delay, s/veh	1.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	0	71	0	316	11	49	206	204
Future Vol, veh/h	0	0	0	0	0	71	0	316	11	49	206	204
Conflicting Peds, #/hr	1	0	2	2	0	1	2	0	3	3	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	2	0	0
Mvmt Flow	0	0	0	0	0	85	0	376	13	58	245	243

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	-	- 199	- 0 0 392 0 0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	- 6.9	- - 4.13 - -
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	- 3.3	- - 2.219 - -
Pot Cap-1 Maneuver	0	0 815	0 - - 1165 - 0
Stage 1	0	0 -	0 - - - - 0
Stage 2	0	0 -	0 - - - - 0
Platoon blocked, %			- - -
Mov Cap-1 Maneuver	-	0 812	- - - 1162 - -
Mov Cap-2 Maneuver	-	0 -	- - - - -
Stage 1	-	0 -	- - - - -
Stage 2	-	0 -	- - - - -

Approach	WB	NB	SB
HCM Control Delay, s	9.9	0	1.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 812	1162	-
HCM Lane V/C Ratio	-	- 0.104	0.05	-
HCM Control Delay (s)	-	- 9.9	8.3	-
HCM Lane LOS	-	- A	A	-
HCM 95th %tile Q(veh)	-	- 0.3	0.2	-

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	326	143	0
Future Vol, veh/h	0	0	0	326	143	0
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	84	84	84	84	84	84
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	0	388	170	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	558	170	170	0	-	0
Stage 1	170	-	-	-	-	-
Stage 2	388	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	494	879	1420	-	-	-
Stage 1	865	-	-	-	-	-
Stage 2	690	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	494	879	1420	-	-	-
Mov Cap-2 Maneuver	494	-	-	-	-	-
Stage 1	865	-	-	-	-	-
Stage 2	690	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1420	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	0	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	-	-	-	

Intersection						
Int Delay, s/veh	8.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	281	5	2	25	18	98
Future Vol, veh/h	281	5	2	25	18	98
Conflicting Peds, #/hr	0	1	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	76	76	76	76	76	76
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	370	7	3	33	24	129
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	128	90	153	0	-	0
Stage 1	89	-	-	-	-	-
Stage 2	39	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	871	973	1440	-	-	-
Stage 1	940	-	-	-	-	-
Stage 2	989	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	869	972	1440	-	-	-
Mov Cap-2 Maneuver	869	-	-	-	-	-
Stage 1	938	-	-	-	-	-
Stage 2	989	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.2	0.6		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1440	-	871	-	-	
HCM Lane V/C Ratio	0.002	-	0.432	-	-	
HCM Control Delay (s)	7.5	0	12.2	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	2.2	-	-	

Queues
1: Highway 417 SB Ramp & Innes

Gloucester Costco Business Centre Gas Bar Addition
2025 Existing Saturday Midday Peak Hour



Lane Group	EBT	EBR	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	923	133	933	500	743	243
v/c Ratio	0.43	0.13	0.44	0.44	0.85	0.16
Control Delay	11.2	1.9	11.2	2.2	44.8	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.2	1.9	11.2	2.2	44.8	0.2
Queue Length 50th (m)	46.5	0.0	47.1	0.0	69.4	0.0
Queue Length 95th (m)	62.8	7.0	63.7	12.2	88.6	0.0
Internal Link Dist (m)	248.5		391.3			
Turn Bay Length (m)		45.0		100.0	75.0	75.0
Base Capacity (vph)	2135	996	2135	1137	969	1502
Starvation Cap Reductn	0	0	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	0.43	0.13	0.44	0.44	0.77	0.16
Intersection Summary						

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

1: Highway 417 SB Ramp & Innes

2025 Existing Saturday Midday Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗				↖↖		↗
Traffic Volume (veh/h)	0	886	128	0	896	480	0	0	0	713	0	233
Future Volume (veh/h)	0	886	128	0	896	480	0	0	0	713	0	233
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	0	1800	1786	0	1800	1786				1800	0	1758
Adj Flow Rate, veh/h	0	923	0	0	933	0				743	0	0
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96				0.96	0.96	0.96
Percent Heavy Veh, %	0	0	1	0	0	1				0	0	3
Cap, veh/h	0	2129		0	2129					853	0	
Arrive On Green	0.00	0.62	0.00	0.00	0.62	0.00				0.26	0.00	0.00
Sat Flow, veh/h	0	3510	1514	0	3510	1514				3326	0	1490
Grp Volume(v), veh/h	0	923	0	0	933	0				743	0	0
Grp Sat Flow(s),veh/h/ln	0	1710	1514	0	1710	1514				1663	0	1490
Q Serve(g_s), s	0.0	14.0	0.0	0.0	14.2	0.0				21.4	0.0	0.0
Cycle Q Clear(g_c), s	0.0	14.0	0.0	0.0	14.2	0.0				21.4	0.0	0.0
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2129		0	2129					853	0	
V/C Ratio(X)	0.00	0.43		0.00	0.44					0.87	0.00	
Avail Cap(c_a), veh/h	0	2129		0	2129					961	0	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	9.8	0.0	0.0	9.8	0.0				35.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.6	0.0	0.0	0.7	0.0				8.0	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
%ile BackOfQ(95%),veh/ln	0.0	9.8	0.0	0.0	9.9	0.0				15.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	10.4	0.0	0.0	10.5	0.0				43.6	0.0	0.0
LnGrp LOS	A	B		A	B					D	A	
Approach Vol, veh/h		923			933						743	
Approach Delay, s/veh		10.4			10.5						43.6	
Approach LOS		B			B						D	
Timer - Assigned Phs		2			6			8				
Phs Duration (G+Y+Rc), s		68.2			68.2			31.8				
Change Period (Y+Rc), s		* 6			* 6			6.1				
Max Green Setting (Gmax), s		* 59			* 59			28.9				
Max Q Clear Time (g_c+I1), s		16.0			16.2			23.4				
Green Ext Time (p_c), s		21.6			21.8			2.3				
Intersection Summary												
HCM 6th Ctrl Delay			19.9									
HCM 6th LOS			B									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Queues
2: Highway 417 NB Ramp & Innes

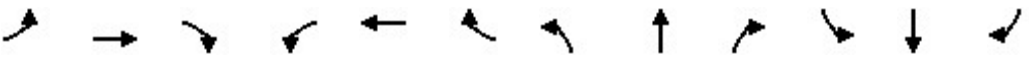
Gloucester Costco Business Centre Gas Bar Addition
2025 Existing Saturday Midday Peak Hour

	→	↘	←	↖	↙	↗
Lane Group	EBT	EBR	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	1428	221	1265	919	154	471
v/c Ratio	0.52	0.17	0.46	0.65	0.49	0.30
Control Delay	4.8	0.7	1.0	12.6	52.2	0.5
Queue Delay	0.0	0.0	0.0	0.7	0.0	0.0
Total Delay	4.8	0.7	1.0	13.3	52.2	0.5
Queue Length 50th (m)	44.0	0.0	3.0	71.3	16.4	0.0
Queue Length 95th (m)	64.5	4.6	m5.9	m64.6	25.9	0.0
Internal Link Dist (m)	391.3		192.3			
Turn Bay Length (m)				180.0	100.0	75.0
Base Capacity (vph)	2756	1278	2756	1419	723	1547
Starvation Cap Reductn	0	0	0	208	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.17	0.46	0.76	0.21	0.30
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

2: Highway 417 NB Ramp & Innes

2025 Existing Saturday Midday Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗	↖↖		↗			
Traffic Volume (veh/h)	0	1385	214	0	1227	891	149	0	457	0	0	0
Future Volume (veh/h)	0	1385	214	0	1227	891	149	0	457	0	0	0
Initial Q (Qb), veh	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			
Parking Bus, Adj	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				
Adj Sat Flow, veh/h/ln	0	1800	1800	0	1800	1800	1772	0	1800			
Adj Flow Rate, veh/h	0	1428	0	0	1265	0	154	0	0			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	0	0	0	0	0	0	2	0	0			
Cap, veh/h	0	2814		0	2814		229	0				
Arrive On Green	0.00	0.82	0.00	0.00	1.00	0.00	0.07	0.00	0.00			
Sat Flow, veh/h	0	3510	1525	0	3510	1525	3274	0	1525			
Grp Volume(v), veh/h	0	1428	0	0	1265	0	154	0	0			
Grp Sat Flow(s),veh/h/ln	0	1710	1525	0	1710	1525	1637	0	1525			
Q Serve(g_s), s	0.0	14.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0			
Cycle Q Clear(g_c), s	0.0	14.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0			
Prop In Lane	0.00		1.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2814		0	2814		229	0				
V/C Ratio(X)	0.00	0.51		0.00	0.45		0.67	0.00				
Avail Cap(c_a), veh/h	0	2814		0	2814		720	0				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	0.00	0.00	0.10	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	0.0	3.0	0.0	0.0	0.0	0.0	49.9	0.0	0.0			
Incr Delay (d2), s/veh	0.0	0.7	0.0	0.0	0.1	0.0	3.4	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			
%ile BackOfQ(95%),veh/ln	0.0	8.7	0.0	0.0	0.0	0.0	4.1	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	3.6	0.0	0.0	0.1	0.0	53.3	0.0	0.0			
LnGrp LOS	A	A		A	A		D	A				
Approach Vol, veh/h		1428			1265			154				
Approach Delay, s/veh		3.6			0.1			53.3				
Approach LOS		A			A			D				
Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		96.5		13.5		96.5						
Change Period (Y+Rc), s		* 6		* 5.8		* 6						
Max Green Setting (Gmax), s		* 74		* 24		* 74						
Max Q Clear Time (g_c+I1), s		16.0		7.0		2.0						
Green Ext Time (p_c), s		42.7		0.7		42.7						
Intersection Summary												
HCM 6th Ctrl Delay			4.7									
HCM 6th LOS			A									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.												

Queues
3: Innes Crossing & Innes

Gloucester Costco Business Centre Gas Bar Addition

2025 Existing Saturday Midday Peak Hour



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	218	1664	27	1925	129	80	113	10	246
v/c Ratio	1.22	0.76	0.24	1.08	0.21	0.14	0.25	0.02	0.35
Control Delay	180.2	26.6	59.0	48.9	1.5	16.4	27.0	23.3	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	180.2	26.6	59.0	48.9	1.5	16.4	27.0	23.3	4.8
Queue Length 50th (m)	~55.8	116.3	5.5	~173.6	1.3	7.0	17.0	1.4	0.3
Queue Length 95th (m)	#103.1	141.7	m5.7	m34.8	m1.1	17.4	31.0	5.1	16.4
Internal Link Dist (m)		192.3		193.0		122.5		129.2	
Turn Bay Length (m)	50.0		45.0		90.0		45.0		45.0
Base Capacity (vph)	179	2198	179	1788	620	559	454	645	698
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	1.22	0.76	0.15	1.08	0.21	0.14	0.25	0.02	0.35

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

3: Innes Crossing & Innes

2025 Existing Saturday Midday Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 			 	
Traffic Volume (veh/h)	209	1587	11	26	1848	124	34	13	30	108	10	236
Future Volume (veh/h)	209	1587	11	26	1848	124	34	13	30	108	10	236
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	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	218	1653	11	27	1925	129	35	14	31	112	10	246
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	178	2206	15	44	1769	547	244	103	190	566	638	539
Arrive On Green	0.21	0.88	0.88	0.03	0.48	0.48	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	1714	5036	34	1714	4914	1519	555	290	535	1379	1800	1522
Grp Volume(v), veh/h	218	1075	589	27	1925	129	80	0	0	112	10	246
Grp Sat Flow(s),veh/h/ln	1714	1638	1794	1714	1638	1519	1380	0	0	1379	1800	1522
Q Serve(g_s), s	11.4	13.0	13.0	1.7	39.6	5.5	1.2	0.0	0.0	1.5	0.4	13.7
Cycle Q Clear(g_c), s	11.4	13.0	13.0	1.7	39.6	5.5	3.8	0.0	0.0	5.3	0.4	13.7
Prop In Lane	1.00		0.02	1.00		1.00	0.44		0.39	1.00		1.00
Lane Grp Cap(c), veh/h	178	1435	786	44	1769	547	536	0	0	566	638	539
V/C Ratio(X)	1.23	0.75	0.75	0.62	1.09	0.24	0.15	0.00	0.00	0.20	0.02	0.46
Avail Cap(c_a), veh/h	178	1435	786	178	1769	547	536	0	0	566	638	539
HCM Platoon Ratio	2.00	2.00	2.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.88	0.88	0.88	0.09	0.09	0.09	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.6	4.6	4.6	52.6	28.7	19.8	24.1	0.0	0.0	24.5	23.0	27.3
Incr Delay (d2), s/veh	137.9	3.2	5.7	1.3	40.8	0.1	0.6	0.0	0.0	0.8	0.0	2.8
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(95%),veh/ln	18.1	4.7	6.2	1.2	26.4	2.7	3.0	0.0	0.0	4.2	0.3	9.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	181.5	7.8	10.4	53.9	69.4	19.9	24.7	0.0	0.0	25.3	23.1	30.1
LnGrp LOS	F	A	B	D	F	B	C	A	A	C	C	C
Approach Vol, veh/h	1882			2081			80			368		
Approach Delay, s/veh	28.7			66.2			24.7			28.5		
Approach LOS	C			E			C			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.4	54.6		46.0	18.0	46.0		46.0				
Change Period (Y+Rc), s	* 6.6	6.4		7.0	* 6.6	6.4		7.0				
Max Green Setting (Gmax), s	* 11	39.6		39.0	* 11	39.6		39.0				
Max Q Clear Time (g_c+I1), s	3.7	15.0		5.8	13.4	41.6		15.7				
Green Ext Time (p_c), s	0.0	22.0		1.2	0.0	0.0		2.3				

Intersection Summary

HCM 6th Ctrl Delay	46.3
HCM 6th LOS	D

Notes

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

Queues
4: Cryville & Innes

Gloucester Costco Business Centre Gas Bar Addition
2025 Existing Saturday Midday Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	101	1297	380	180	1529	254	361	91	180	228	71	170
v/c Ratio	0.58	1.09	0.59	0.87	1.19	0.50	1.14	0.16	0.31	0.73	0.13	0.29
Control Delay	70.2	92.0	16.6	92.3	124.7	8.8	138.7	28.6	5.6	62.8	28.1	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.2	92.0	16.6	92.3	124.7	8.8	138.7	28.6	5.6	62.8	28.1	5.7
Queue Length 50th (m)	23.3	~110.2	29.2	32.4	~148.6	11.7	~46.7	14.1	0.0	24.9	10.9	0.0
Queue Length 95th (m)	m31.7	#139.9	m56.6	#76.5	#179.7	15.8	#75.5	26.4	15.0	#40.6	21.5	14.8
Internal Link Dist (m)		193.0			155.0			42.3			210.4	
Turn Bay Length (m)	70.0		85.0	45.0		60.0	55.0		45.0	90.0		100.0
Base Capacity (vph)	213	1188	646	213	1283	512	317	564	589	313	558	585
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	1.09	0.59	0.85	1.19	0.50	1.14	0.16	0.31	0.73	0.13	0.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

4: Cryville & Innes

2025 Existing Saturday Midday Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 			 		
Traffic Volume (veh/h)	98	1258	369	175	1483	246	350	88	175	221	69	165
Future Volume (veh/h)	98	1258	369	175	1483	246	350	88	175	221	69	165
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		0.99	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	1800	1800	1800	1800	1800	1786	1800	1800	1786	1786	1786	1786
Adj Flow Rate, veh/h	101	1297	0	180	1529	0	361	91	180	228	71	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	0	0	0	0	1	0	0	1	1	1	1
Cap, veh/h	127	1177		206	1404		314	558	465	312	554	
Arrive On Green	0.05	0.16	0.00	0.16	0.38	0.00	0.09	0.31	0.31	0.09	0.31	0.00
Sat Flow, veh/h	1714	4914	1525	1714	4914	1514	3326	1800	1500	3300	1786	1514
Grp Volume(v), veh/h	101	1297	0	180	1529	0	361	91	180	228	71	0
Grp Sat Flow(s),veh/h/ln	1714	1638	1525	1714	1638	1514	1663	1800	1500	1650	1786	1514
Q Serve(g_s), s	6.4	26.4	0.0	11.3	31.4	0.0	10.4	4.0	7.4	7.4	3.1	0.0
Cycle Q Clear(g_c), s	6.4	26.4	0.0	11.3	31.4	0.0	10.4	4.0	7.4	7.4	3.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	127	1177		206	1404		314	558	465	312	554	
V/C Ratio(X)	0.79	1.10		0.87	1.09		1.15	0.16	0.39	0.73	0.13	
Avail Cap(c_a), veh/h	212	1177		212	1404		314	558	465	312	554	
HCM Platoon Ratio	0.67	0.67	0.67	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.62	0.62	0.00	0.82	0.82	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	51.4	46.2	0.0	45.4	34.1	0.0	49.8	27.6	15.4	48.4	27.3	0.0
Incr Delay (d2), s/veh	6.8	54.4	0.0	25.7	50.3	0.0	97.1	0.6	2.4	8.5	0.5	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(95%),veh/ln	5.5	24.2	0.0	10.2	27.2	0.0	14.4	3.6	5.7	6.5	2.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.2	100.6	0.0	71.1	84.4	0.0	146.9	28.2	17.8	56.9	27.7	0.0
LnGrp LOS	E	F		E	F		F	C	B	E	C	
Approach Vol, veh/h		1398			1709			632			299	
Approach Delay, s/veh		97.5			83.0			93.1			50.0	
Approach LOS		F			F			F			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.4	32.6	17.0	41.0	14.4	37.6	17.0	41.0				
Change Period (Y+Rc), s	* 6.2	* 6.2	* 6.6	6.9	* 6.2	* 6.2	* 6.6	6.9				
Max Green Setting (Gmax), s	* 14	* 26	* 10	34.1	* 14	* 26	* 10	34.1				
Max Q Clear Time (g_c+I1), s	13.3	28.4	9.4	9.4	8.4	33.4	12.4	5.1				
Green Ext Time (p_c), s	0.0	0.0	0.1	2.4	0.2	0.0	0.0	0.9				

Intersection Summary

HCM 6th Ctrl Delay	87.2
HCM 6th LOS	F

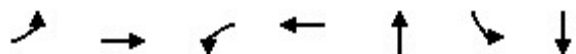
Notes

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

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

Queues
5: Stonehenge Crescent & Innes

Gloucester Costco Business Centre Gas Bar Addition
2025 Existing Saturday Midday Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	61	1647	68	1941	89	26	71
v/c Ratio	0.42	0.47	0.45	0.55	0.55	0.24	0.39
Control Delay	56.9	2.7	56.3	11.0	34.7	51.2	18.1
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	56.9	2.7	56.3	11.0	34.7	51.2	18.1
Queue Length 50th (m)	13.9	8.8	14.1	76.4	7.3	5.4	0.6
Queue Length 95th (m)	m14.8	m20.9	27.2	114.3	22.1	13.5	13.4
Internal Link Dist (m)		155.0		158.8	65.7		136.4
Turn Bay Length (m)	40.0		45.0			25.0	
Base Capacity (vph)	157	3525	163	3542	492	442	540
Starvation Cap Reductn	0	403	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.53	0.42	0.55	0.18	0.06	0.13

Intersection Summary

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

5: Stonehenge Crescent & Innes

2025 Existing Saturday Midday Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	1538	10	64	1811	13	29	4	51	24	3	64
Future Volume (veh/h)	57	1538	10	64	1811	13	29	4	51	24	3	64
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	0.99		0.99	0.99		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	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	61	1636	11	68	1927	14	31	4	54	26	3	68
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	78	3245	22	87	3269	24	86	26	105	219	8	183
Arrive On Green	0.06	0.86	0.86	0.05	0.65	0.65	0.13	0.13	0.13	0.13	0.13	0.13
Sat Flow, veh/h	1714	5036	34	1714	5033	37	334	205	832	1355	64	1454
Grp Volume(v), veh/h	61	1064	583	68	1254	687	89	0	0	26	0	71
Grp Sat Flow(s),veh/h/ln	1714	1638	1794	1714	1638	1793	1371	0	0	1355	0	1518
Q Serve(g_s), s	3.9	9.0	9.0	4.3	23.9	23.9	2.4	0.0	0.0	0.0	0.0	4.7
Cycle Q Clear(g_c), s	3.9	9.0	9.0	4.3	23.9	23.9	7.1	0.0	0.0	2.3	0.0	4.7
Prop In Lane	1.00		0.02	1.00		0.02	0.35		0.61	1.00		0.96
Lane Grp Cap(c), veh/h	78	2111	1156	87	2128	1165	217	0	0	219	0	191
V/C Ratio(X)	0.78	0.50	0.50	0.78	0.59	0.59	0.41	0.00	0.00	0.12	0.00	0.37
Avail Cap(c_a), veh/h	137	2111	1156	137	2128	1165	503	0	0	486	0	490
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)	0.18	0.18	0.18	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.2	3.4	3.4	51.6	10.9	10.9	44.9	0.0	0.0	43.0	0.0	44.1
Incr Delay (d2), s/veh	3.2	0.2	0.3	14.3	1.2	2.2	1.2	0.0	0.0	0.2	0.0	1.2
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(95%),veh/ln	2.7	3.4	3.7	4.1	14.8	16.3	4.5	0.0	0.0	1.3	0.0	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.3	3.6	3.7	65.9	12.2	13.1	46.2	0.0	0.0	43.3	0.0	45.3
LnGrp LOS	D	A	A	E	B	B	D	A	A	D	A	D
Approach Vol, veh/h	1708				2009				89		97	
Approach Delay, s/veh	5.5				14.3				46.2		44.7	
Approach LOS	A				B				D		D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.8	76.9		21.4	11.2	77.5		21.4				
Change Period (Y+Rc), s	* 6.2	6.0		7.5	* 6.2	6.0		7.5				
Max Green Setting (Gmax), s	* 8.8	46.0		35.5	* 8.8	46.0		35.5				
Max Q Clear Time (g_c+I1), s	6.3	11.0		9.1	5.9	25.9		6.7				
Green Ext Time (p_c), s	0.0	30.1		1.2	0.0	19.1		1.2				

Intersection Summary

HCM 6th Ctrl Delay	11.9
HCM 6th LOS	B

Notes

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

Intersection												
Int Delay, s/veh	1.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	1	0	102	0	511	20	16	273	324
Future Vol, veh/h	0	0	0	1	0	102	0	511	20	16	273	324
Conflicting Peds, #/hr	0	0	2	2	0	0	0	0	1	1	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	0	0	1	0	110	0	549	22	17	294	348
Major/Minor				Minor1		Major1			Major2			
Conflicting Flow All				891	-	287	-	0	0	572	0	0
Stage 1				561	-	-	-	-	-	-	-	-
Stage 2				330	-	-	-	-	-	-	-	-
Critical Hdwy				6.6	-	6.9	-	-	-	4.1	-	-
Critical Hdwy Stg 1				5.8	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.4	-	-	-	-	-	-	-	-
Follow-up Hdwy				3.5	-	3.3	-	-	-	2.2	-	-
Pot Cap-1 Maneuver				300	0	716	0	-	-	1011	-	0
Stage 1				540	0	-	0	-	-	-	-	0
Stage 2				733	0	-	0	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver				293	0	715	-	-	-	1010	-	-
Mov Cap-2 Maneuver				293	0	-	-	-	-	-	-	-
Stage 1				539	0	-	-	-	-	-	-	-
Stage 2				717	0	-	-	-	-	-	-	-
Approach				WB		NB			SB			
HCM Control Delay, s				10.9		0			0.5			
HCM LOS				B								
Minor Lane/Major Mvmt		NBT	NBRWBLn1	SBL	SBT							
Capacity (veh/h)		-	-	715	1010	-						
HCM Lane V/C Ratio		-	-	0.153	0.017	-						
HCM Control Delay (s)		-	-	10.9	8.6	-						
HCM Lane LOS		-	-	B	A	-						
HCM 95th %tile Q(veh)		-	-	0.5	0.1	-						

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	541	222	0
Future Vol, veh/h	0	0	0	541	222	0
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	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	0	582	239	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	821	239	239	0	-	0
Stage 1	239	-	-	-	-	-
Stage 2	582	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	347	805	1340	-	-	-
Stage 1	805	-	-	-	-	-
Stage 2	563	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	347	805	1340	-	-	-
Mov Cap-2 Maneuver	347	-	-	-	-	-
Stage 1	805	-	-	-	-	-
Stage 2	563	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1340	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	0	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	-	-	-	

Intersection						
Int Delay, s/veh	10.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	450	0	1	9	24	124
Future Vol, veh/h	450	0	1	9	24	124
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	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	495	0	1	10	26	136
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	106	94	162	0	-	0
Stage 1	94	-	-	-	-	-
Stage 2	12	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	897	968	1429	-	-	-
Stage 1	935	-	-	-	-	-
Stage 2	1016	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	896	968	1429	-	-	-
Mov Cap-2 Maneuver	896	-	-	-	-	-
Stage 1	934	-	-	-	-	-
Stage 2	1016	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	13.9	0.8		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1429	-	896	-	-	
HCM Lane V/C Ratio	0.001	-	0.552	-	-	
HCM Control Delay (s)	7.5	0	13.9	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	3.5	-	-	

Appendix G
Year 2027 Background Conditions Operational
Worksheets

Queues
1: Highway 417 SB Ramp & Innes

Gloucester Costco Business Centre Gas Bar Addition
2027 Background Weekday AM Peak Hour

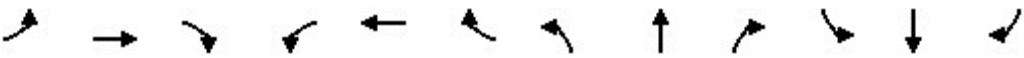


Lane Group	EBT	EBR	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	757	138	1876	429	365	645
v/c Ratio	0.29	0.14	0.70	0.34	0.82	0.43
Control Delay	5.1	0.9	6.9	1.3	82.3	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.1	0.9	6.9	1.3	82.3	0.9
Queue Length 50th (m)	31.7	0.0	68.2	5.8	58.6	0.0
Queue Length 95th (m)	39.8	4.6	84.6	7.0	76.2	0.0
Internal Link Dist (m)	248.5		391.3			
Turn Bay Length (m)		45.0		100.0	75.0	75.0
Base Capacity (vph)	2572	1021	2699	1275	491	1502
Starvation Cap Reductn	0	0	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	0.29	0.14	0.70	0.34	0.74	0.43
Intersection Summary						

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

1: Highway 417 SB Ramp & Innes

2027 Background Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗				↘↘		↗
Traffic Volume (veh/h)	0	757	138	0	1876	429	0	0	0	365	0	645
Future Volume (veh/h)	0	757	138	0	1876	429	0	0	0	365	0	645
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	0	1716	1477	0	1786	1758				1772	0	1758
Adj Flow Rate, veh/h	0	757	0	0	1876	0				365	0	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Percent Heavy Veh, %	0	6	23	0	1	3				2	0	3
Cap, veh/h	0	2598		0	2704					417	0	
Arrive On Green	0.00	0.80	0.00	0.00	0.80	0.00				0.13	0.00	0.00
Sat Flow, veh/h	0	3346	1252	0	3483	1490				3274	0	1490
Grp Volume(v), veh/h	0	757	0	0	1876	0				365	0	0
Grp Sat Flow(s),veh/h/ln	0	1630	1252	0	1697	1490				1637	0	1490
Q Serve(g_s), s	0.0	9.8	0.0	0.0	40.2	0.0				17.5	0.0	0.0
Cycle Q Clear(g_c), s	0.0	9.8	0.0	0.0	40.2	0.0				17.5	0.0	0.0
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2598		0	2704					417	0	
V/C Ratio(X)	0.00	0.29		0.00	0.69					0.88	0.00	
Avail Cap(c_a), veh/h	0	2598		0	2704					489	0	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	4.3	0.0	0.0	7.4	0.0				68.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.0	1.5	0.0				14.5	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
%ile BackOfQ(95%),veh/ln	0.0	6.8	0.0	0.0	22.8	0.0				13.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	4.6	0.0	0.0	8.9	0.0				83.0	0.0	0.0
LnGrp LOS	A	A		A	A					F	A	
Approach Vol, veh/h		757			1876						365	
Approach Delay, s/veh		4.6			8.9						83.0	
Approach LOS		A			A						F	
Timer - Assigned Phs		2			6			8				
Phs Duration (G+Y+Rc), s		133.5			133.5			26.5				
Change Period (Y+Rc), s		* 6			* 6			6.1				
Max Green Setting (Gmax), s		* 1.2E2			* 1.2E2			23.9				
Max Q Clear Time (g_c+I1), s		11.8			42.2			19.5				
Green Ext Time (p_c), s		21.5			71.7			0.9				

Intersection Summary

HCM 6th Ctrl Delay	16.8
HCM 6th LOS	B

Notes

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

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

Queues
2: Highway 417 NB Ramp & Innes

Gloucester Costco Business Centre Gas Bar Addition

2027 Background Weekday AM Peak Hour

	→	↘	←	↖	↙	↗
Lane Group	EBT	EBR	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	908	214	1892	1053	412	592
v/c Ratio	0.35	0.20	0.72	0.74	0.81	0.40
Control Delay	4.0	0.4	2.2	10.8	78.1	0.8
Queue Delay	0.0	0.0	0.1	1.4	0.0	0.0
Total Delay	4.0	0.4	2.4	12.2	78.1	0.8
Queue Length 50th (m)	26.1	0.0	8.7	50.0	65.9	0.0
Queue Length 95th (m)	32.2	m0.0	m12.6	m324.3	82.7	0.0
Internal Link Dist (m)	391.3		192.3			
Turn Bay Length (m)				180.0	100.0	75.0
Base Capacity (vph)	2585	1079	2610	1421	594	1473
Starvation Cap Reductn	0	0	109	190	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.20	0.76	0.86	0.69	0.40
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

2: Highway 417 NB Ramp & Innes

2027 Background Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↑		↑↑	↑	↑↑		↑			
Traffic Volume (veh/h)	0	908	214	0	1892	1053	412	0	592	0	0	0
Future Volume (veh/h)	0	908	214	0	1892	1053	412	0	592	0	0	0
Initial Q (Qb), veh	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			
Parking Bus, Adj	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				
Adj Sat Flow, veh/h/ln	0	1758	1617	0	1772	1786	1758	0	1730			
Adj Flow Rate, veh/h	0	908	0	0	1892	0	412	0	0			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	0	3	13	0	2	1	3	0	5			
Cap, veh/h	0	2607		0	2627		474	0				
Arrive On Green	0.00	0.78	0.00	0.00	1.00	0.00	0.15	0.00	0.00			
Sat Flow, veh/h	0	3428	1371	0	3455	1514	3248	0	1466			
Grp Volume(v), veh/h	0	908	0	0	1892	0	412	0	0			
Grp Sat Flow(s),veh/h/ln	0	1670	1371	0	1683	1514	1624	0	1466			
Q Serve(g_s), s	0.0	13.1	0.0	0.0	0.0	0.0	19.9	0.0	0.0			
Cycle Q Clear(g_c), s	0.0	13.1	0.0	0.0	0.0	0.0	19.9	0.0	0.0			
Prop In Lane	0.00		1.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2607		0	2627		474	0				
V/C Ratio(X)	0.00	0.35		0.00	0.72		0.87	0.00				
Avail Cap(c_a), veh/h	0	2607		0	2627		593	0				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	0.00	0.00	0.20	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	0.0	5.3	0.0	0.0	0.0	0.0	66.8	0.0	0.0			
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.0	0.4	0.0	11.1	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			
%ile BackOfQ(95%),veh/ln	0.0	9.0	0.0	0.0	0.2	0.0	14.3	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	5.7	0.0	0.0	0.4	0.0	78.0	0.0	0.0			
LnGrp LOS	A	A		A	A		E	A				
Approach Vol, veh/h		908			1892			412				
Approach Delay, s/veh		5.7			0.4			78.0				
Approach LOS		A			A			E				
Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		130.9		29.1		130.9						
Change Period (Y+Rc), s		* 6		* 5.8		* 6						
Max Green Setting (Gmax), s		* 1.2E2		* 29		* 1.2E2						
Max Q Clear Time (g_c+I1), s		15.1		21.9		2.0						
Green Ext Time (p_c), s		28.7		1.5		98.2						
Intersection Summary												
HCM 6th Ctrl Delay				11.8								
HCM 6th LOS				B								
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.												

Queues
3: Innes Crossing & Innes

Gloucester Costco Business Centre Gas Bar Addition

2027 Background Weekday AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	146	1265	25	2785	48	89	37	3	110
v/c Ratio	1.62	0.43	0.32	0.98	0.05	0.26	0.12	0.01	0.25
Control Delay	372.7	11.4	93.6	10.1	0.1	44.4	48.6	46.0	13.9
Queue Delay	0.0	0.0	0.0	6.7	0.0	0.0	0.0	0.0	0.0
Total Delay	372.7	11.4	93.6	16.8	0.1	44.4	48.6	46.0	13.9
Queue Length 50th (m)	~67.9	70.8	8.1	31.2	0.0	19.8	9.3	0.7	4.4
Queue Length 95th (m)	#114.3	80.1	m8.6	m33.5	m0.0	36.5	19.6	3.7	20.9
Internal Link Dist (m)		192.3		193.0		122.5		129.2	
Turn Bay Length (m)	50.0		45.0		90.0		45.0		45.0
Base Capacity (vph)	90	2945	90	2846	905	346	311	443	437
Starvation Cap Reductn	0	0	0	65	0	0	0	0	0
Spillback Cap Reductn	0	0	0	91	0	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.62	0.43	0.28	1.01	0.05	0.26	0.12	0.01	0.25

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

3: Innes Crossing & Innes

2027 Background Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 			 	
Traffic Volume (veh/h)	146	1259	6	25	2785	48	48	16	25	37	3	110
Future Volume (veh/h)	146	1259	6	25	2785	48	48	16	25	37	3	110
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	1800	1744	1800	1800	1786	1800	1660	1800	1744	1800	1800	1786
Adj Flow Rate, veh/h	146	1259	6	25	2785	48	48	16	25	37	3	110
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	4	0	0	1	0	10	0	4	0	0	1
Cap, veh/h	90	2984	14	36	2822	881	214	73	99	374	439	368
Arrive On Green	0.02	0.20	0.20	0.02	0.58	0.58	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	1714	4890	23	1714	4876	1521	737	300	405	1386	1800	1512
Grp Volume(v), veh/h	146	817	448	25	2785	48	89	0	0	37	3	110
Grp Sat Flow(s),veh/h/ln	1714	1587	1740	1714	1625	1521	1442	0	0	1386	1800	1512
Q Serve(g_s), s	8.4	36.0	36.0	2.3	89.8	2.2	6.0	0.0	0.0	0.0	0.2	9.5
Cycle Q Clear(g_c), s	8.4	36.0	36.0	2.3	89.8	2.2	7.7	0.0	0.0	3.9	0.2	9.5
Prop In Lane	1.00		0.01	1.00		1.00	0.54		0.28	1.00		1.00
Lane Grp Cap(c), veh/h	90	1937	1062	36	2822	881	386	0	0	374	439	368
V/C Ratio(X)	1.62	0.42	0.42	0.70	0.99	0.05	0.23	0.00	0.00	0.10	0.01	0.30
Avail Cap(c_a), veh/h	90	1937	1062	90	2822	881	386	0	0	374	439	368
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)	0.94	0.94	0.94	0.13	0.13	0.13	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	78.6	39.3	39.3	77.8	33.1	14.7	48.6	0.0	0.0	47.2	45.8	49.3
Incr Delay (d2), s/veh	322.5	0.6	1.2	3.1	3.8	0.0	1.4	0.0	0.0	0.5	0.0	2.1
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(95%),veh/ln	19.7	22.1	24.1	1.7	41.8	1.4	5.8	0.0	0.0	2.3	0.2	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	401.2	39.9	40.4	81.0	36.9	14.7	49.9	0.0	0.0	47.7	45.9	51.4
LnGrp LOS	F	D	D	F	D	B	D	A	A	D	D	D
Approach Vol, veh/h		1411			2858			89			150	
Approach Delay, s/veh		77.4			36.9			49.9			50.4	
Approach LOS		E			D			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.0	104.0		46.0	15.0	99.0		46.0				
Change Period (Y+Rc), s	* 6.6	6.4		7.0	* 6.6	6.4		7.0				
Max Green Setting (Gmax), s	* 8.4	92.6		39.0	* 8.4	92.6		39.0				
Max Q Clear Time (g_c+I1), s	4.3	38.0		9.7	10.4	91.8		11.5				
Green Ext Time (p_c), s	0.0	33.9		1.3	0.0	0.8		0.9				
Intersection Summary												
HCM 6th Ctrl Delay				50.3								
HCM 6th LOS				D								
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Queues
4: Cryville & Innes

Gloucester Costco Business Centre Gas Bar Addition

2027 Background Weekday AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	115	1059	142	50	2528	504	171	71	41	120	29	153
v/c Ratio	1.02	0.42	0.18	0.52	1.02	0.60	1.02	0.19	0.10	0.71	0.07	0.38
Control Delay	178.3	10.9	0.5	93.8	50.5	12.0	147.5	53.4	0.5	96.2	51.1	17.0
Queue Delay	0.0	0.0	0.0	0.0	32.7	1.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	178.3	10.9	0.5	93.8	83.3	13.1	147.5	53.4	0.5	96.2	51.1	17.0
Queue Length 50th (m)	~39.2	23.5	0.0	14.8	~310.7	78.9	~29.5	18.7	0.0	19.7	7.5	8.5
Queue Length 95th (m)	#82.4	26.3	1.0	m20.3	#335.0	82.0	#55.0	33.5	0.0	#33.8	16.8	29.7
Internal Link Dist (m)		193.0			155.0			42.3			210.4	
Turn Bay Length (m)	70.0		85.0	45.0		60.0	55.0		45.0	90.0		100.0
Base Capacity (vph)	113	2531	810	112	2484	847	167	365	393	170	387	404
Starvation Cap Reductn	0	0	0	0	190	157	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	53	0	0	0	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.42	0.18	0.45	1.10	0.73	1.02	0.19	0.10	0.71	0.07	0.38

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

4: Cryville & Innes

2027 Background Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 			 		
Traffic Volume (veh/h)	115	1059	142	50	2528	504	171	71	41	120	29	153
Future Volume (veh/h)	115	1059	142	50	2528	504	171	71	41	120	29	153
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		0.99	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	1758	1744	1716	1744	1786	1772	1730	1716	1730	1758	1800	1744
Adj Flow Rate, veh/h	115	1059	0	50	2528	0	171	71	41	120	29	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, %	3	4	6	4	1	2	5	6	5	3	0	4
Cap, veh/h	113	2544		63	2462		168	366	310	171	384	
Arrive On Green	0.02	0.18	0.00	0.01	0.17	0.00	0.05	0.21	0.21	0.05	0.21	0.00
Sat Flow, veh/h	1674	4761	1454	1661	4876	1502	3196	1716	1454	3248	1800	1478
Grp Volume(v), veh/h	115	1059	0	50	2528	0	171	71	41	120	29	0
Grp Sat Flow(s),veh/h/ln	1674	1587	1454	1661	1625	1502	1598	1716	1454	1624	1800	1478
Q Serve(g_s), s	10.8	31.6	0.0	4.8	80.8	0.0	8.4	5.4	3.0	5.8	2.1	0.0
Cycle Q Clear(g_c), s	10.8	31.6	0.0	4.8	80.8	0.0	8.4	5.4	3.0	5.8	2.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	113	2544		63	2462		168	366	310	171	384	
V/C Ratio(X)	1.02	0.42		0.79	1.03		1.02	0.19	0.13	0.70	0.08	
Avail Cap(c_a), veh/h	113	2544		112	2462		168	366	310	171	384	
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.00	0.58	0.58	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	78.2	43.7	0.0	78.4	66.7	0.0	75.8	51.7	33.5	74.6	50.3	0.0
Incr Delay (d2), s/veh	85.5	0.5	0.0	11.8	21.2	0.0	74.6	1.2	0.9	12.3	0.4	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(95%),veh/ln	12.0	19.7	0.0	4.3	49.9	0.0	9.2	4.7	2.2	5.1	1.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	163.8	44.2	0.0	90.2	87.9	0.0	150.4	52.9	34.3	86.9	50.7	0.0
LnGrp LOS	F	D		F	F		F	D	C	F	D	
Approach Vol, veh/h		1174			2578			283			149	
Approach Delay, s/veh		55.9			88.0			109.1			79.8	
Approach LOS		E			F			F			E	
Timer - Assigned Phs												
Phs Duration (G+Y+Rc), s	12.3	91.7	15.0	41.0	17.0	87.0	15.0	41.0				
Change Period (Y+Rc), s	* 6.2	* 6.2	* 6.6	6.9	* 6.2	* 6.2	* 6.6	6.9				
Max Green Setting (Gmax), s	* 11	* 81	* 8.4	34.1	* 11	* 81	* 8.4	34.1				
Max Q Clear Time (g_c+I1), s	6.8	33.6	7.8	7.4	12.8	82.8	10.4	4.1				
Green Ext Time (p_c), s	0.0	25.8	0.0	1.2	0.0	0.0	0.0	0.3				

Intersection Summary

HCM 6th Ctrl Delay	80.1
HCM 6th LOS	F

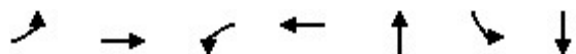
Notes

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

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

Queues
5: Stonehenge Crescent & Innes

Gloucester Costco Business Centre Gas Bar Addition
2027 Background Weekday AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	17	1122	63	3005	35	14	84
v/c Ratio	0.23	0.30	0.53	0.75	0.36	0.22	0.56
Control Delay	72.9	2.3	86.9	10.2	40.4	79.6	30.0
Queue Delay	0.0	0.0	0.0	9.2	0.0	0.0	0.0
Total Delay	72.9	2.3	86.9	19.5	40.4	79.6	30.0
Queue Length 50th (m)	5.8	9.4	19.7	166.9	2.5	4.4	1.3
Queue Length 95th (m)	m12.8	10.7	35.4	227.1	14.2	12.1	18.7
Internal Link Dist (m)		155.0		158.8	65.7		136.4
Turn Bay Length (m)	40.0		45.0			25.0	
Base Capacity (vph)	130	3684	142	3997	349	295	398
Starvation Cap Reductn	0	576	0	0	0	0	0
Spillback Cap Reductn	0	0	0	1000	0	0	16
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.36	0.44	1.00	0.10	0.05	0.22

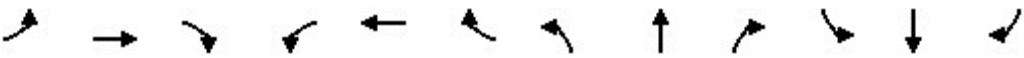
Intersection Summary

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

5: Stonehenge Crescent & Innes

2027 Background Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	1113	9	63	2997	8	6	2	27	14	4	80
Future Volume (veh/h)	17	1113	9	63	2997	8	6	2	27	14	4	80
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	0.99		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	1716	1744	1337	1772	1786	1800	1800	1800	1800	1800	1800	1786
Adj Flow Rate, veh/h	17	1113	9	63	2997	8	6	2	27	14	4	80
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, %	6	4	33	2	1	0	0	0	0	0	0	1
Cap, veh/h	27	3543	29	79	3804	10	39	21	114	159	7	148
Arrive On Green	0.01	0.49	0.49	0.05	0.76	0.76	0.10	0.10	0.10	0.10	0.10	0.10
Sat Flow, veh/h	1634	4871	39	1688	5021	13	124	207	1114	1388	72	1443
Grp Volume(v), veh/h	17	725	397	63	1939	1066	35	0	0	14	0	84
Grp Sat Flow(s),veh/h/ln	1634	1587	1736	1688	1625	1783	1444	0	0	1388	0	1515
Q Serve(g_s), s	1.7	22.1	22.1	5.9	57.3	57.5	0.0	0.0	0.0	0.0	0.0	8.4
Cycle Q Clear(g_c), s	1.7	22.1	22.1	5.9	57.3	57.5	8.4	0.0	0.0	2.4	0.0	8.4
Prop In Lane	1.00		0.02	1.00		0.01	0.17		0.77	1.00		0.95
Lane Grp Cap(c), veh/h	27	2309	1263	79	2463	1351	174	0	0	159	0	155
V/C Ratio(X)	0.63	0.31	0.31	0.80	0.79	0.79	0.20	0.00	0.00	0.09	0.00	0.54
Avail Cap(c_a), veh/h	131	2309	1263	135	2463	1351	351	0	0	325	0	336
HCM Platoon Ratio	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.90	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	78.6	16.8	16.8	75.5	11.6	11.7	65.9	0.0	0.0	65.5	0.0	68.2
Incr Delay (d2), s/veh	19.5	0.3	0.6	16.3	2.6	4.7	0.6	0.0	0.0	0.2	0.0	2.9
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(95%),veh/ln	1.6	14.2	15.4	5.5	30.9	34.6	2.5	0.0	0.0	1.0	0.0	6.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	98.2	17.2	17.4	91.8	14.3	16.4	66.5	0.0	0.0	65.7	0.0	71.1
LnGrp LOS	F	B	B	F	B	B	E	A	A	E	A	E
Approach Vol, veh/h	1139			3068			35			98		
Approach Delay, s/veh	18.5			16.6			66.5			70.4		
Approach LOS	B			B			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.7	122.4		23.9	8.9	127.2		23.9				
Change Period (Y+Rc), s	* 6.2	6.0		7.5	* 6.2	6.0		7.5				
Max Green Setting (Gmax), s	* 13	92.0		35.5	* 13	92.0		35.5				
Max Q Clear Time (g_c+I1), s	7.9	24.1		10.4	3.7	59.5		10.4				
Green Ext Time (p_c), s	0.1	32.6		0.3	0.0	32.4		1.3				

Intersection Summary

HCM 6th Ctrl Delay	18.7
HCM 6th LOS	B

Notes

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

Intersection												
Int Delay, s/veh	3.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	0	136	0	149	16	49	97	75
Future Vol, veh/h	0	0	0	0	0	136	0	149	16	49	97	75
Conflicting Peds, #/hr	0	0	4	4	0	0	0	0	2	2	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-
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	0	0	0	4	0	7	6	2	7	4
Mvmt Flow	0	0	0	0	0	136	0	149	16	49	97	75
Major/Minor				Minor1			Major1			Major2		
Conflicting Flow All				-	-	85	-	0	0	167	0	0
Stage 1				-	-	-	-	-	-	-	-	-
Stage 2				-	-	-	-	-	-	-	-	-
Critical Hdwy				-	-	6.96	-	-	-	4.13	-	-
Critical Hdwy Stg 1				-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2				-	-	-	-	-	-	-	-	-
Follow-up Hdwy				-	-	3.338	-	-	-	2.219	-	-
Pot Cap-1 Maneuver				0	0	952	0	-	-	1410	-	0
Stage 1				0	0	-	0	-	-	-	-	0
Stage 2				0	0	-	0	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver				-	0	950	-	-	-	1407	-	-
Mov Cap-2 Maneuver				-	0	-	-	-	-	-	-	-
Stage 1				-	0	-	-	-	-	-	-	-
Stage 2				-	0	-	-	-	-	-	-	-
Approach				WB			NB			SB		
HCM Control Delay, s				9.4			0			2.6		
HCM LOS				A								
Minor Lane/Major Mvmt		NBT	NBR	WBLn1	SBL	SBT						
Capacity (veh/h)		-	-	950	1407	-						
HCM Lane V/C Ratio		-	-	0.143	0.035	-						
HCM Control Delay (s)		-	-	9.4	7.7	-						
HCM Lane LOS		-	-	A	A	-						
HCM 95th %tile Q(veh)		-	-	0.5	0.1	-						

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	163	89	0
Future Vol, veh/h	0	0	0	163	89	0
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	0	0	0	0
Mvmt Flow	0	0	0	163	89	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	252	89	89	0	-	0
Stage 1	89	-	-	-	-	-
Stage 2	163	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	741	975	1519	-	-	-
Stage 1	940	-	-	-	-	-
Stage 2	871	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	741	975	1519	-	-	-
Mov Cap-2 Maneuver	741	-	-	-	-	-
Stage 1	940	-	-	-	-	-
Stage 2	871	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1519	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection						
Int Delay, s/veh	4.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	113	0	3	49	22	66
Future Vol, veh/h	113	0	3	49	22	66
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, %	4	0	0	12	27	0
Mvmt Flow	113	0	3	49	22	66
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	110	55	88	0	-	0
Stage 1	55	-	-	-	-	-
Stage 2	55	-	-	-	-	-
Critical Hdwy	6.44	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	882	1018	1520	-	-	-
Stage 1	962	-	-	-	-	-
Stage 2	962	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	880	1018	1520	-	-	-
Mov Cap-2 Maneuver	880	-	-	-	-	-
Stage 1	960	-	-	-	-	-
Stage 2	962	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.7	0.4		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1520	-	880	-	-	
HCM Lane V/C Ratio	0.002	-	0.128	-	-	
HCM Control Delay (s)	7.4	0	9.7	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0.4	-	-	

Queues
1: Highway 417 SB Ramp & Innes

Gloucester Costco Business Centre Gas Bar Addition

2027 Background Weekday PM Peak Hour

	→	↘	←	↖	↘	↖
Lane Group	EBT	EBR	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	1338	362	797	504	924	279
v/c Ratio	0.65	0.36	0.40	0.45	0.90	0.21
Control Delay	20.3	6.7	7.2	1.9	58.0	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.3	6.7	7.2	1.9	58.0	0.4
Queue Length 50th (m)	123.3	17.1	28.0	3.9	124.3	0.0
Queue Length 95th (m)	153.2	37.0	34.8	6.5	147.0	0.0
Internal Link Dist (m)	248.5		391.3			
Turn Bay Length (m)		45.0		100.0	75.0	75.0
Base Capacity (vph)	2073	995	1994	1108	1123	1311
Starvation Cap Reductn	0	0	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	0.65	0.36	0.40	0.45	0.82	0.21
Intersection Summary						

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

1: Highway 417 SB Ramp & Innes

2027 Background Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗				↘↘		↗
Traffic Volume (veh/h)	0	1338	362	0	797	504	0	0	0	924	0	279
Future Volume (veh/h)	0	1338	362	0	797	504	0	0	0	924	0	279
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	0	1786	1758	0	1730	1758				1800	0	1547
Adj Flow Rate, veh/h	0	1338	0	0	797	0				924	0	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Percent Heavy Veh, %	0	1	3	0	5	3				0	0	18
Cap, veh/h	0	2060		0	1995					1020	0	
Arrive On Green	0.00	0.61	0.00	0.00	0.61	0.00				0.31	0.00	0.00
Sat Flow, veh/h	0	3483	1490	0	3373	1490				3326	0	1311
Grp Volume(v), veh/h	0	1338	0	0	797	0				924	0	0
Grp Sat Flow(s),veh/h/ln	0	1697	1490	0	1643	1490				1663	0	1311
Q Serve(g_s), s	0.0	35.8	0.0	0.0	17.6	0.0				37.3	0.0	0.0
Cycle Q Clear(g_c), s	0.0	35.8	0.0	0.0	17.6	0.0				37.3	0.0	0.0
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2060		0	1995					1020	0	
V/C Ratio(X)	0.00	0.65		0.00	0.40					0.91	0.00	
Avail Cap(c_a), veh/h	0	2060		0	1995					1114	0	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	17.9	0.0	0.0	14.3	0.0				46.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.6	0.0	0.0	0.6	0.0				10.1	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
%ile BackOfQ(95%),veh/ln	0.0	22.1	0.0	0.0	11.9	0.0				24.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	19.5	0.0	0.0	14.9	0.0				56.7	0.0	0.0
LnGrp LOS	A	B		A	B					E	A	
Approach Vol, veh/h		1338			797						924	
Approach Delay, s/veh		19.5			14.9						56.7	
Approach LOS		B			B						E	
Timer - Assigned Phs		2			6			8				
Phs Duration (G+Y+Rc), s		91.0			91.0			49.0				
Change Period (Y+Rc), s		* 6			* 6			6.1				
Max Green Setting (Gmax), s		* 81			* 81			46.9				
Max Q Clear Time (g_c+I1), s		37.8			19.6			39.3				
Green Ext Time (p_c), s		32.2			20.8			3.6				
Intersection Summary												
HCM 6th Ctrl Delay			29.5									
HCM 6th LOS			C									

Notes

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

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

Queues
2: Highway 417 NB Ramp & Innes

Gloucester Costco Business Centre Gas Bar Addition

2027 Background Weekday PM Peak Hour

						
Lane Group	EBT	EBR	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	1915	346	1135	684	165	664
v/c Ratio	0.68	0.27	0.41	0.50	0.61	0.44
Control Delay	6.1	0.7	0.7	4.2	69.8	0.9
Queue Delay	0.1	0.0	0.1	0.2	0.0	0.0
Total Delay	6.2	0.7	0.7	4.4	69.8	1.0
Queue Length 50th (m)	126.3	2.5	3.0	24.3	22.9	0.0
Queue Length 95th (m)	137.0	m5.0	4.3	174.0	33.9	0.0
Internal Link Dist (m)	391.3		192.3			
Turn Bay Length (m)				180.0	100.0	75.0
Base Capacity (vph)	2832	1274	2776	1378	587	1513
Starvation Cap Reductn	0	0	427	194	0	0
Spillback Cap Reductn	119	0	0	0	0	52
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.27	0.48	0.58	0.28	0.45
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

2: Highway 417 NB Ramp & Innes

2027 Background Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗	↗↗		↗			
Traffic Volume (veh/h)	0	1915	346	0	1135	684	165	0	664	0	0	0
Future Volume (veh/h)	0	1915	346	0	1135	684	165	0	664	0	0	0
Initial Q (Qb), veh	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			
Parking Bus, Adj	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				
Adj Sat Flow, veh/h/ln	0	1800	1772	0	1772	1786	1533	0	1786			
Adj Flow Rate, veh/h	0	1915	0	0	1135	0	165	0	0			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	0	0	2	0	2	1	19	0	1			
Cap, veh/h	0	2867		0	2822		220	0				
Arrive On Green	0.00	0.84	0.00	0.00	1.00	0.00	0.08	0.00	0.00			
Sat Flow, veh/h	0	3510	1502	0	3455	1514	2833	0	1514			
Grp Volume(v), veh/h	0	1915	0	0	1135	0	165	0	0			
Grp Sat Flow(s),veh/h/ln	0	1710	1502	0	1683	1514	1416	0	1514			
Q Serve(g_s), s	0.0	28.8	0.0	0.0	0.0	0.0	8.0	0.0	0.0			
Cycle Q Clear(g_c), s	0.0	28.8	0.0	0.0	0.0	0.0	8.0	0.0	0.0			
Prop In Lane	0.00		1.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2867		0	2822		220	0				
V/C Ratio(X)	0.00	0.67		0.00	0.40		0.75	0.00				
Avail Cap(c_a), veh/h	0	2867		0	2822		591	0				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	0.00	0.00	0.73	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	0.0	4.2	0.0	0.0	0.0	0.0	63.3	0.0	0.0			
Incr Delay (d2), s/veh	0.0	1.3	0.0	0.0	0.3	0.0	5.1	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			
%ile BackOfQ(95%),veh/ln	0.0	16.2	0.0	0.0	0.2	0.0	5.7	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	5.4	0.0	0.0	0.3	0.0	68.4	0.0	0.0			
LnGrp LOS	A	A		A	A		E	A				
Approach Vol, veh/h		1915			1135			165				
Approach Delay, s/veh		5.4			0.3			68.4				
Approach LOS		A			A			E				
Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		123.3		16.7		123.3						
Change Period (Y+Rc), s		* 6		* 5.8		* 6						
Max Green Setting (Gmax), s		* 99		* 29		* 99						
Max Q Clear Time (g_c+I1), s		30.8		10.0		2.0						
Green Ext Time (p_c), s		61.6		0.9		41.7						
Intersection Summary												
HCM 6th Ctrl Delay			6.8									
HCM 6th LOS			A									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.												

Queues
3: Innes Crossing & Innes

Gloucester Costco Business Centre Gas Bar Addition

2027 Background Weekday PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	126	2365	20	1600	70	92	88	14	174
v/c Ratio	0.85	0.86	0.24	0.67	0.09	0.22	0.25	0.03	0.32
Control Delay	112.3	21.0	81.0	7.8	0.8	33.2	41.4	37.1	6.9
Queue Delay	0.0	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	112.3	21.3	81.0	7.9	0.8	33.2	41.4	37.1	6.9
Queue Length 50th (m)	36.5	164.2	5.5	33.1	0.3	15.9	19.0	2.8	0.0
Queue Length 95th (m)	m#66.3	232.3	m8.9	39.1	m1.0	30.8	33.8	8.4	17.4
Internal Link Dist (m)		192.3		193.0		122.5		129.2	
Turn Bay Length (m)	50.0		45.0		90.0		45.0		45.0
Base Capacity (vph)	153	2761	139	2396	786	414	359	507	550
Starvation Cap Reductn	0	74	0	139	0	0	0	0	0
Spillback Cap Reductn	0	0	0	34	0	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.88	0.14	0.71	0.09	0.22	0.25	0.03	0.32

Intersection Summary

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

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

3: Innes Crossing & Innes

2027 Background Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 			 	
Traffic Volume (veh/h)	126	2358	7	20	1600	70	43	19	30	88	14	174
Future Volume (veh/h)	126	2358	7	20	1600	70	43	19	30	88	14	174
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		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	1800	1786	1603	1660	1772	1800	1730	1800	1758	1800	1800	1800
Adj Flow Rate, veh/h	126	2358	7	20	1600	70	43	19	30	88	14	174
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	14	10	2	0	5	0	3	0	0	0
Cap, veh/h	148	2807	8	31	2382	746	209	94	129	427	501	424
Arrive On Green	0.09	0.56	0.56	0.02	0.49	0.49	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1714	5019	15	1581	4837	1515	615	339	462	1374	1800	1520
Grp Volume(v), veh/h	126	1527	838	20	1600	70	92	0	0	88	14	174
Grp Sat Flow(s),veh/h/ln	1714	1625	1783	1581	1612	1515	1416	0	0	1374	1800	1520
Q Serve(g_s), s	10.1	54.7	54.7	1.8	35.1	3.4	4.3	0.0	0.0	1.1	0.8	13.1
Cycle Q Clear(g_c), s	10.1	54.7	54.7	1.8	35.1	3.4	6.6	0.0	0.0	7.7	0.8	13.1
Prop In Lane	1.00		0.01	1.00		1.00	0.47		0.33	1.00		1.00
Lane Grp Cap(c), veh/h	148	1818	997	31	2382	746	432	0	0	427	501	424
V/C Ratio(X)	0.85	0.84	0.84	0.66	0.67	0.09	0.21	0.00	0.00	0.21	0.03	0.41
Avail Cap(c_a), veh/h	152	1818	997	140	2382	746	432	0	0	427	501	424
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)	0.75	0.75	0.75	0.73	0.73	0.73	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	63.1	25.6	25.7	68.2	27.0	18.9	38.7	0.0	0.0	39.2	36.7	41.1
Incr Delay (d2), s/veh	27.4	3.7	6.5	16.0	1.1	0.2	1.1	0.0	0.0	1.1	0.1	2.9
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(95%),veh/ln	9.2	30.3	33.8	1.6	20.1	2.5	5.0	0.0	0.0	4.8	0.7	9.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	90.5	29.3	32.2	84.2	28.1	19.1	39.8	0.0	0.0	40.3	36.8	44.1
LnGrp LOS	F	C	C	F	C	B	D	A	A	D	D	D
Approach Vol, veh/h		2491			1690			92			276	
Approach Delay, s/veh		33.4			28.4			39.8			42.5	
Approach LOS		C			C			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.3	84.7		46.0	18.7	75.3		46.0				
Change Period (Y+Rc), s	* 6.6	6.4		7.0	* 6.6	6.4		7.0				
Max Green Setting (Gmax), s	* 12	68.6		39.0	* 12	68.6		39.0				
Max Q Clear Time (g_c+I1), s	3.8	56.7		8.6	12.1	37.1		15.1				
Green Ext Time (p_c), s	0.0	11.8		1.4	0.0	27.4		1.7				

Intersection Summary

HCM 6th Ctrl Delay	32.2
HCM 6th LOS	C

Notes

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

Queues
4: Cryville & Innes

Gloucester Costco Business Centre Gas Bar Addition

2027 Background Weekday PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	80	2138	249	94	1280	218	212	57	118	541	116	190
v/c Ratio	0.67	1.16	0.39	0.74	0.70	0.33	0.51	0.13	0.25	1.31	0.26	0.38
Control Delay	98.0	110.0	12.2	110.0	31.8	5.1	62.1	42.4	7.4	203.7	44.7	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	98.0	110.0	12.2	110.0	32.0	5.1	62.1	42.4	7.4	203.7	44.7	9.5
Queue Length 50th (m)	23.5	~253.2	14.0	22.3	110.7	14.7	28.7	12.4	0.0	~99.0	26.2	2.6
Queue Length 95th (m)	m28.4	#282.1	m24.5	#54.1	128.7	8.5	41.8	24.2	13.9	#134.8	43.4	22.4
Internal Link Dist (m)		193.0			155.0			42.3			210.4	
Turn Bay Length (m)	70.0		85.0	45.0		60.0	55.0		45.0	90.0		100.0
Base Capacity (vph)	129	1837	644	133	1830	659	416	443	463	412	443	498
Starvation Cap Reductn	0	0	0	0	69	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	1.16	0.39	0.71	0.73	0.33	0.51	0.13	0.25	1.31	0.26	0.38

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

4: Cryville & Innes

2027 Background Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 			 		
Traffic Volume (veh/h)	80	2138	249	94	1280	218	212	57	118	541	116	190
Future Volume (veh/h)	80	2138	249	94	1280	218	212	57	118	541	116	190
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		0.99	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	1758	1786	1786	1800	1772	1772	1800	1800	1800	1786	1800	1772
Adj Flow Rate, veh/h	80	2138	0	94	1280	0	212	57	118	541	116	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, %	3	1	1	0	2	2	0	0	0	1	0	2
Cap, veh/h	99	1852		115	1878		413	438	368	410	438	
Arrive On Green	0.08	0.51	0.00	0.02	0.13	0.00	0.12	0.24	0.24	0.12	0.24	0.00
Sat Flow, veh/h	1674	4876	1514	1714	4837	1502	3326	1800	1512	3300	1800	1502
Grp Volume(v), veh/h	80	2138	0	94	1280	0	212	57	118	541	116	0
Grp Sat Flow(s),veh/h/ln	1674	1625	1514	1714	1612	1502	1663	1800	1512	1650	1800	1502
Q Serve(g_s), s	6.6	53.2	0.0	7.6	35.4	0.0	8.3	3.5	7.2	17.4	7.3	0.0
Cycle Q Clear(g_c), s	6.6	53.2	0.0	7.6	35.4	0.0	8.3	3.5	7.2	17.4	7.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	99	1852		115	1878		413	438	368	410	438	
V/C Ratio(X)	0.81	1.15		0.81	0.68		0.51	0.13	0.32	1.32	0.26	
Avail Cap(c_a), veh/h	129	1852		132	1878		413	438	368	410	438	
HCM Platoon Ratio	1.33	1.33	1.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.44	0.44	0.00	0.90	0.90	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	63.7	34.6	0.0	67.6	52.8	0.0	57.3	41.4	27.7	61.3	42.8	0.0
Incr Delay (d2), s/veh	12.2	72.6	0.0	25.7	1.8	0.0	1.1	0.6	2.3	159.9	1.5	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(95%),veh/ln	5.2	44.7	0.0	7.7	22.1	0.0	6.8	3.1	5.6	26.2	6.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.9	107.3	0.0	93.3	54.6	0.0	58.4	42.0	30.0	221.2	44.3	0.0
LnGrp LOS	E	F		F	D		E	D	C	F	D	
Approach Vol, veh/h		2218			1374			387			657	
Approach Delay, s/veh		106.1			57.2			47.3			190.0	
Approach LOS		F			E			D			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.6	59.4	24.0	41.0	14.4	60.6	24.0	41.0				
Change Period (Y+Rc), s	* 6.2	* 6.2	* 6.6	6.9	* 6.2	* 6.2	* 6.6	6.9				
Max Green Setting (Gmax), s	* 11	* 52	* 17	34.1	* 11	* 52	* 17	34.1				
Max Q Clear Time (g_c+I1), s	9.6	55.2	19.4	9.2	8.6	37.4	10.3	9.3				
Green Ext Time (p_c), s	0.0	0.0	0.0	1.4	0.1	12.1	0.6	1.6				

Intersection Summary

HCM 6th Ctrl Delay	98.6
HCM 6th LOS	F

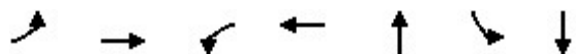
Notes

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

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

Queues
5: Stonehenge Crescent & Innes

Gloucester Costco Business Centre Gas Bar Addition
2027 Background Weekday PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	66	2704	59	1540	96	20	62
v/c Ratio	0.49	0.74	0.47	0.43	0.62	0.30	0.41
Control Delay	73.4	5.5	73.9	8.8	41.1	72.0	24.6
Queue Delay	0.0	0.5	0.0	0.0	0.0	0.0	0.0
Total Delay	73.4	6.0	73.9	8.8	41.1	72.0	24.6
Queue Length 50th (m)	19.5	31.5	16.0	57.3	8.4	5.4	1.3
Queue Length 95th (m)	m15.6	m51.6	30.0	85.7	26.0	13.5	15.2
Internal Link Dist (m)		155.0		158.8	65.7		136.4
Turn Bay Length (m)	40.0		45.0			25.0	
Base Capacity (vph)	139	3636	132	3570	418	260	426
Starvation Cap Reductn	0	444	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.85	0.45	0.43	0.23	0.08	0.15

Intersection Summary

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

5: Stonehenge Crescent & Innes

2027 Background Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	66	2697	7	59	1518	22	21	10	65	20	5	57
Future Volume (veh/h)	66	2697	7	59	1518	22	21	10	65	20	5	57
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		0.98	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	1800	1786	1800	1800	1772	1800	1730	1800	1800	1800	1800	1772
Adj Flow Rate, veh/h	66	2697	7	59	1518	22	21	10	65	20	5	57
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	0	0	2	0	5	0	0	0	0	2
Cap, veh/h	83	3458	9	75	3359	49	58	36	131	197	16	177
Arrive On Green	0.05	0.69	0.69	0.04	0.68	0.68	0.13	0.13	0.13	0.13	0.13	0.13
Sat Flow, veh/h	1714	5021	13	1714	4912	71	209	282	1029	1328	122	1395
Grp Volume(v), veh/h	66	1745	959	59	997	543	96	0	0	20	0	62
Grp Sat Flow(s),veh/h/ln	1714	1625	1783	1714	1612	1758	1520	0	0	1328	0	1517
Q Serve(g_s), s	5.3	50.5	50.6	4.8	19.8	19.8	1.7	0.0	0.0	0.0	0.0	5.2
Cycle Q Clear(g_c), s	5.3	50.5	50.6	4.8	19.8	19.8	8.0	0.0	0.0	2.7	0.0	5.2
Prop In Lane	1.00		0.01	1.00		0.04	0.22		0.68	1.00		0.92
Lane Grp Cap(c), veh/h	83	2239	1228	75	2206	1202	224	0	0	197	0	192
V/C Ratio(X)	0.79	0.78	0.78	0.79	0.45	0.45	0.43	0.00	0.00	0.10	0.00	0.32
Avail Cap(c_a), veh/h	108	2239	1228	108	2206	1202	412	0	0	365	0	385
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)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	65.9	14.6	14.7	66.3	10.1	10.1	56.8	0.0	0.0	54.6	0.0	55.6
Incr Delay (d2), s/veh	2.8	0.3	0.5	21.2	0.7	1.2	1.3	0.0	0.0	0.2	0.0	1.0
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(95%),veh/ln	3.3	22.2	24.3	4.7	12.6	13.7	6.2	0.0	0.0	1.2	0.0	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.8	14.9	15.1	87.5	10.8	11.4	58.1	0.0	0.0	54.8	0.0	56.6
LnGrp LOS	E	B	B	F	B	B	E	A	A	D	A	E
Approach Vol, veh/h	2770		1599				96		82			
Approach Delay, s/veh	16.3		13.8				58.1		56.2			
Approach LOS	B		B				E		E			
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	12.3	102.4	25.3		13.0	101.7	25.3					
Change Period (Y+Rc), s	* 6.2	6.0	7.5		* 6.2	6.0	7.5					
Max Green Setting (Gmax), s	* 8.8	76.0	35.5		* 8.8	76.0	35.5					
Max Q Clear Time (g_c+I1), s	6.8	52.6	10.0		7.3	21.8	7.2					
Green Ext Time (p_c), s	0.0	23.2	1.3		0.0	41.2	1.0					
Intersection Summary												
HCM 6th Ctrl Delay	17.0											
HCM 6th LOS	B											
Notes												

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	0	71	0	316	11	49	206	204
Future Vol, veh/h	0	0	0	0	0	71	0	316	11	49	206	204
Conflicting Peds, #/hr	1	0	2	2	0	1	2	0	3	3	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-
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	0	0	0	0	0	0	0	2	0	0
Mvmt Flow	0	0	0	0	0	71	0	316	11	49	206	204
Major/Minor				Minor1		Major1		Major2				
Conflicting Flow All				-	-	168	-	0	0	330	0	0
Stage 1				-	-	-	-	-	-	-	-	-
Stage 2				-	-	-	-	-	-	-	-	-
Critical Hdwy				-	-	6.9	-	-	-	4.13	-	-
Critical Hdwy Stg 1				-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2				-	-	-	-	-	-	-	-	-
Follow-up Hdwy				-	-	3.3	-	-	-	2.219	-	-
Pot Cap-1 Maneuver				0	0	853	0	-	-	1228	-	0
Stage 1				0	0	-	0	-	-	-	-	0
Stage 2				0	0	-	0	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver				-	0	850	-	-	-	1225	-	-
Mov Cap-2 Maneuver				-	0	-	-	-	-	-	-	-
Stage 1				-	0	-	-	-	-	-	-	-
Stage 2				-	0	-	-	-	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s				9.6		0		1.5				
HCM LOS				A								
Minor Lane/Major Mvmt		NBT	NBR	WBLn1	SBL	SBT						
Capacity (veh/h)		-	-	850	1225	-						
HCM Lane V/C Ratio		-	-	0.084	0.04	-						
HCM Control Delay (s)		-	-	9.6	8.1	-						
HCM Lane LOS		-	-	A	A	-						
HCM 95th %tile Q(veh)		-	-	0.3	0.1	-						

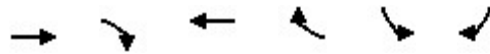
Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	326	143	0
Future Vol, veh/h	0	0	0	326	143	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	0	326	143	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	469	143	143	0	-	0
Stage 1	143	-	-	-	-	-
Stage 2	326	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	556	910	1452	-	-	-
Stage 1	889	-	-	-	-	-
Stage 2	736	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	556	910	1452	-	-	-
Mov Cap-2 Maneuver	556	-	-	-	-	-
Stage 1	889	-	-	-	-	-
Stage 2	736	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1452	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	0	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	-	-	-	

Intersection						
Int Delay, s/veh	7.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	281	5	2	25	18	98
Future Vol, veh/h	281	5	2	25	18	98
Conflicting Peds, #/hr	0	1	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	0	0	0	0
Mvmt Flow	281	5	2	25	18	98
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	96	68	116	0	-	0
Stage 1	67	-	-	-	-	-
Stage 2	29	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	908	1001	1485	-	-	-
Stage 1	961	-	-	-	-	-
Stage 2	999	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	907	1000	1485	-	-	-
Mov Cap-2 Maneuver	907	-	-	-	-	-
Stage 1	960	-	-	-	-	-
Stage 2	999	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.8	0.6		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1485	-	908	-	-	
HCM Lane V/C Ratio	0.001	-	0.315	-	-	
HCM Control Delay (s)	7.4	0	10.8	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	1.4	-	-	

Queues
1: Highway 417 SB Ramp & Innes

Gloucester Costco Business Centre Gas Bar Addition

2027 Background Saturday Midday Peak Hour



Lane Group	EBT	EBR	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	922	133	932	499	742	242
v/c Ratio	0.43	0.13	0.44	0.44	0.85	0.16
Control Delay	11.1	1.9	11.2	2.2	44.8	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.1	1.9	11.2	2.2	44.8	0.2
Queue Length 50th (m)	46.4	0.0	47.0	0.0	69.3	0.0
Queue Length 95th (m)	62.7	7.0	63.5	12.1	88.5	0.0
Internal Link Dist (m)	248.5		391.3			
Turn Bay Length (m)		45.0		100.0	75.0	75.0
Base Capacity (vph)	2135	997	2135	1137	969	1502
Starvation Cap Reductn	0	0	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	0.43	0.13	0.44	0.44	0.77	0.16
Intersection Summary						

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

1: Highway 417 SB Ramp & Innes

2027 Background Saturday Midday Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗				↘↘		↗
Traffic Volume (veh/h)	0	922	133	0	932	499	0	0	0	742	0	242
Future Volume (veh/h)	0	922	133	0	932	499	0	0	0	742	0	242
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	0	1800	1786	0	1800	1786				1800	0	1758
Adj Flow Rate, veh/h	0	922	0	0	932	0				742	0	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Percent Heavy Veh, %	0	0	1	0	0	1				0	0	3
Cap, veh/h	0	2129		0	2129					853	0	
Arrive On Green	0.00	0.62	0.00	0.00	0.62	0.00				0.26	0.00	0.00
Sat Flow, veh/h	0	3510	1514	0	3510	1514				3326	0	1490
Grp Volume(v), veh/h	0	922	0	0	932	0				742	0	0
Grp Sat Flow(s),veh/h/ln	0	1710	1514	0	1710	1514				1663	0	1490
Q Serve(g_s), s	0.0	13.9	0.0	0.0	14.1	0.0				21.4	0.0	0.0
Cycle Q Clear(g_c), s	0.0	13.9	0.0	0.0	14.1	0.0				21.4	0.0	0.0
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2129		0	2129					853	0	
V/C Ratio(X)	0.00	0.43		0.00	0.44					0.87	0.00	
Avail Cap(c_a), veh/h	0	2129		0	2129					961	0	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	9.7	0.0	0.0	9.8	0.0				35.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.6	0.0	0.0	0.7	0.0				8.0	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
%ile BackOfQ(95%),veh/ln	0.0	9.8	0.0	0.0	9.9	0.0				15.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	10.4	0.0	0.0	10.4	0.0				43.6	0.0	0.0
LnGrp LOS	A	B		A	B					D	A	
Approach Vol, veh/h		922			932						742	
Approach Delay, s/veh		10.4			10.4						43.6	
Approach LOS		B			B						D	
Timer - Assigned Phs	2				6			8				
Phs Duration (G+Y+Rc), s	68.3				68.3			31.7				
Change Period (Y+Rc), s	* 6				* 6			6.1				
Max Green Setting (Gmax), s	* 59				* 59			28.9				
Max Q Clear Time (g_c+I1), s	15.9				16.1			23.4				
Green Ext Time (p_c), s	21.5				21.8			2.3				

Intersection Summary

HCM 6th Ctrl Delay	19.9
HCM 6th LOS	B

Notes

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

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

Queues
2: Highway 417 NB Ramp & Innes

Gloucester Costco Business Centre Gas Bar Addition
2027 Background Saturday Midday Peak Hour

	→	↘	←	↖	↙	↗
Lane Group	EBT	EBR	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	1441	223	1277	927	155	475
v/c Ratio	0.52	0.17	0.46	0.65	0.49	0.31
Control Delay	4.9	0.7	1.1	12.9	52.3	0.5
Queue Delay	0.0	0.0	0.0	0.7	0.0	0.0
Total Delay	4.9	0.7	1.1	13.6	52.3	0.5
Queue Length 50th (m)	44.8	0.0	3.1	73.4	16.5	0.0
Queue Length 95th (m)	65.1	4.6	m6.0	m67.0	26.0	0.0
Internal Link Dist (m)	391.3		192.3			
Turn Bay Length (m)				180.0	100.0	75.0
Base Capacity (vph)	2756	1278	2756	1421	723	1547
Starvation Cap Reductn	0	0	0	208	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.17	0.46	0.76	0.21	0.31

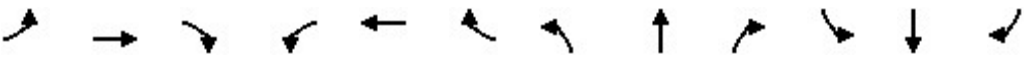
Intersection Summary

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

2: Highway 417 NB Ramp & Innes

2027 Background Saturday Midday Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗	↖↗		↗			
Traffic Volume (veh/h)	0	1441	223	0	1277	927	155	0	475	0	0	0
Future Volume (veh/h)	0	1441	223	0	1277	927	155	0	475	0	0	0
Initial Q (Qb), veh	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			
Parking Bus, Adj	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				
Adj Sat Flow, veh/h/ln	0	1800	1800	0	1800	1800	1772	0	1800			
Adj Flow Rate, veh/h	0	1441	0	0	1277	0	155	0	0			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	0	0	0	0	0	0	2	0	0			
Cap, veh/h	0	2812		0	2812		231	0				
Arrive On Green	0.00	0.82	0.00	0.00	1.00	0.00	0.07	0.00	0.00			
Sat Flow, veh/h	0	3510	1525	0	3510	1525	3274	0	1525			
Grp Volume(v), veh/h	0	1441	0	0	1277	0	155	0	0			
Grp Sat Flow(s),veh/h/ln	0	1710	1525	0	1710	1525	1637	0	1525			
Q Serve(g_s), s	0.0	14.2	0.0	0.0	0.0	0.0	5.1	0.0	0.0			
Cycle Q Clear(g_c), s	0.0	14.2	0.0	0.0	0.0	0.0	5.1	0.0	0.0			
Prop In Lane	0.00		1.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2812		0	2812		231	0				
V/C Ratio(X)	0.00	0.51		0.00	0.45		0.67	0.00				
Avail Cap(c_a), veh/h	0	2812		0	2812		720	0				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	0.00	0.00	0.11	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	0.0	3.0	0.0	0.0	0.0	0.0	49.9	0.0	0.0			
Incr Delay (d2), s/veh	0.0	0.7	0.0	0.0	0.1	0.0	3.4	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			
%ile BackOfQ(95%),veh/ln	0.0	8.8	0.0	0.0	0.0	0.0	4.1	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	3.7	0.0	0.0	0.1	0.0	53.3	0.0	0.0			
LnGrp LOS	A	A		A	A		D	A				
Approach Vol, veh/h		1441			1277			155				
Approach Delay, s/veh		3.7			0.1			53.3				
Approach LOS		A			A			D				
Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		96.5		13.5		96.5						
Change Period (Y+Rc), s		* 6		* 5.8		* 6						
Max Green Setting (Gmax), s		* 74		* 24		* 74						
Max Q Clear Time (g_c+I1), s		16.2		7.1		2.0						
Green Ext Time (p_c), s		42.9		0.7		43.2						
Intersection Summary												
HCM 6th Ctrl Delay			4.7									
HCM 6th LOS			A									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.												

Queues
3: Innes Crossing & Innes

Gloucester Costco Business Centre Gas Bar Addition

2027 Background Saturday Midday Peak Hour



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	217	1662	26	1923	129	77	112	10	246
v/c Ratio	1.21	0.76	0.23	1.08	0.21	0.14	0.25	0.02	0.35
Control Delay	178.3	26.5	59.2	48.3	1.4	16.4	27.0	23.3	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	178.3	26.5	59.2	48.3	1.4	16.4	27.0	23.3	4.8
Queue Length 50th (m)	~55.5	116.0	5.3	~173.0	1.3	6.7	16.8	1.4	0.3
Queue Length 95th (m)	#102.2	141.2	m5.3	m33.6	m1.0	16.9	30.8	5.1	16.4
Internal Link Dist (m)		192.3		193.0		122.5		129.2	
Turn Bay Length (m)	50.0		45.0		90.0		45.0		45.0
Base Capacity (vph)	179	2199	179	1788	620	558	455	645	698
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	1.21	0.76	0.15	1.08	0.21	0.14	0.25	0.02	0.35

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

3: Innes Crossing & Innes

2027 Background Saturday Midday Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	217	1651	11	26	1923	129	34	13	30	112	10	246
Future Volume (veh/h)	217	1651	11	26	1923	129	34	13	30	112	10	246
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	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	217	1651	11	26	1923	129	34	13	30	112	10	246
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	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	178	2210	15	43	1769	547	246	99	190	566	638	539
Arrive On Green	0.21	0.88	0.88	0.03	0.48	0.48	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	1714	5036	34	1714	4914	1519	560	281	537	1382	1800	1522
Grp Volume(v), veh/h	217	1074	588	26	1923	129	77	0	0	112	10	246
Grp Sat Flow(s),veh/h/ln	1714	1638	1794	1714	1638	1519	1377	0	0	1382	1800	1522
Q Serve(g_s), s	11.4	12.8	12.8	1.6	39.6	5.5	1.1	0.0	0.0	1.7	0.4	13.7
Cycle Q Clear(g_c), s	11.4	12.8	12.8	1.6	39.6	5.5	3.6	0.0	0.0	5.3	0.4	13.7
Prop In Lane	1.00		0.02	1.00		1.00	0.44		0.39	1.00		1.00
Lane Grp Cap(c), veh/h	178	1437	787	43	1769	547	535	0	0	566	638	539
V/C Ratio(X)	1.22	0.75	0.75	0.61	1.09	0.24	0.14	0.00	0.00	0.20	0.02	0.46
Avail Cap(c_a), veh/h	178	1437	787	178	1769	547	535	0	0	566	638	539
HCM Platoon Ratio	2.00	2.00	2.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.88	0.88	0.88	0.09	0.09	0.09	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.6	4.6	4.6	52.6	28.7	19.8	24.0	0.0	0.0	24.5	23.0	27.3
Incr Delay (d2), s/veh	135.7	3.2	5.7	1.3	40.3	0.1	0.6	0.0	0.0	0.8	0.0	2.8
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(95%),veh/ln	17.9	4.7	6.1	1.2	26.3	2.7	2.8	0.0	0.0	4.2	0.3	9.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	179.3	7.7	10.2	53.9	68.9	19.9	24.6	0.0	0.0	25.3	23.1	30.1
LnGrp LOS	F	A	B	D	F	B	C	A	A	C	C	C
Approach Vol, veh/h		1879			2078			77			368	
Approach Delay, s/veh		28.3			65.7			24.6			28.5	
Approach LOS		C			E			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.3	54.7		46.0	18.0	46.0		46.0				
Change Period (Y+Rc), s	* 6.6	6.4		7.0	* 6.6	6.4		7.0				
Max Green Setting (Gmax), s	* 11	39.6		39.0	* 11	39.6		39.0				
Max Q Clear Time (g_c+I1), s	3.6	14.8		5.6	13.4	41.6		15.7				
Green Ext Time (p_c), s	0.0	22.2		1.2	0.0	0.0		2.3				

Intersection Summary

HCM 6th Ctrl Delay	45.9
HCM 6th LOS	D

Notes

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

Queues
4: Cryville & Innes

Gloucester Costco Business Centre Gas Bar Addition

2027 Background Saturday Midday Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	102	1309	369	175	1543	256	350	88	175	230	69	172
v/c Ratio	0.58	1.10	0.58	0.85	1.20	0.50	1.10	0.16	0.30	0.73	0.12	0.29
Control Delay	70.5	94.1	16.5	90.0	129.9	8.7	127.8	28.5	5.7	63.2	28.1	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.5	94.1	16.5	90.0	129.9	8.7	127.8	28.5	5.7	63.2	28.1	5.6
Queue Length 50th (m)	23.6	~111.9	28.0	31.2	~151.2	12.9	~44.1	13.7	0.0	25.2	10.6	0.0
Queue Length 95th (m)	m31.8	#141.6	m54.6	#73.4	#181.8	14.1	#72.5	25.5	14.8	#41.3	21.0	14.8
Internal Link Dist (m)		193.0			155.0			42.3			210.4	
Turn Bay Length (m)	70.0		85.0	45.0		60.0	55.0		45.0	90.0		100.0
Base Capacity (vph)	213	1192	638	213	1281	511	317	564	585	313	558	586
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	1.10	0.58	0.82	1.20	0.50	1.10	0.16	0.30	0.73	0.12	0.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

4: Cryville & Innes

2027 Background Saturday Midday Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 			 		
Traffic Volume (veh/h)	102	1309	369	175	1543	256	350	88	175	230	69	172
Future Volume (veh/h)	102	1309	369	175	1543	256	350	88	175	230	69	172
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		0.99	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	1800	1800	1800	1800	1800	1786	1800	1800	1786	1786	1786	1786
Adj Flow Rate, veh/h	102	1309	0	175	1543	0	350	88	175	230	69	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	0	0	0	0	1	0	0	1	1	1	1
Cap, veh/h	129	1191		202	1401		314	558	465	312	554	
Arrive On Green	0.05	0.16	0.00	0.16	0.38	0.00	0.09	0.31	0.31	0.09	0.31	0.00
Sat Flow, veh/h	1714	4914	1525	1714	4914	1514	3326	1800	1500	3300	1786	1514
Grp Volume(v), veh/h	102	1309	0	175	1543	0	350	88	175	230	69	0
Grp Sat Flow(s),veh/h/ln	1714	1638	1525	1714	1638	1514	1663	1800	1500	1650	1786	1514
Q Serve(g_s), s	6.5	26.7	0.0	11.0	31.4	0.0	10.4	3.9	7.2	7.5	3.1	0.0
Cycle Q Clear(g_c), s	6.5	26.7	0.0	11.0	31.4	0.0	10.4	3.9	7.2	7.5	3.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	129	1191		202	1401		314	558	465	312	554	
V/C Ratio(X)	0.79	1.10		0.87	1.10		1.11	0.16	0.38	0.74	0.12	
Avail Cap(c_a), veh/h	212	1191		212	1401		314	558	465	312	554	
HCM Platoon Ratio	0.67	0.67	0.67	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.62	0.62	0.00	0.83	0.83	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	51.4	46.1	0.0	45.6	34.2	0.0	49.8	27.5	15.3	48.5	27.2	0.0
Incr Delay (d2), s/veh	6.7	53.4	0.0	24.8	55.3	0.0	84.7	0.6	2.3	8.9	0.5	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(95%),veh/ln	5.5	24.3	0.0	9.9	28.2	0.0	13.5	3.5	5.5	6.6	2.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.1	99.5	0.0	70.4	89.5	0.0	134.5	28.1	17.6	57.3	27.7	0.0
LnGrp LOS	E	F		E	F		F	C	B	E	C	
Approach Vol, veh/h		1411			1718			613			299	
Approach Delay, s/veh		96.5			87.5			85.9			50.5	
Approach LOS		F			F			F			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.1	32.9	17.0	41.0	14.4	37.6	17.0	41.0				
Change Period (Y+Rc), s	* 6.2	* 6.2	* 6.6	6.9	* 6.2	* 6.2	* 6.6	6.9				
Max Green Setting (Gmax), s	* 14	* 26	* 10	34.1	* 14	* 26	* 10	34.1				
Max Q Clear Time (g_c+I1), s	13.0	28.7	9.5	9.2	8.5	33.4	12.4	5.1				
Green Ext Time (p_c), s	0.1	0.0	0.1	2.3	0.2	0.0	0.0	0.9				

Intersection Summary

HCM 6th Ctrl Delay	87.7
HCM 6th LOS	F

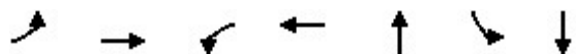
Notes

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

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

Queues
5: Stonehenge Crescent & Innes

Gloucester Costco Business Centre Gas Bar Addition
2027 Background Saturday Midday Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	59	1610	67	1898	87	25	70
v/c Ratio	0.41	0.46	0.45	0.53	0.54	0.23	0.38
Control Delay	56.4	2.4	56.2	10.7	34.6	50.9	18.3
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	56.4	2.5	56.2	10.7	34.6	50.9	18.3
Queue Length 50th (m)	13.6	6.8	13.9	73.1	7.1	5.2	0.6
Queue Length 95th (m)	m14.4	m18.9	26.9	109.4	21.9	13.1	13.4
Internal Link Dist (m)		155.0		158.8	65.7		136.4
Turn Bay Length (m)	40.0		45.0			25.0	
Base Capacity (vph)	156	3531	162	3551	492	449	540
Starvation Cap Reductn	0	426	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.52	0.41	0.53	0.18	0.06	0.13

Intersection Summary

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

5: Stonehenge Crescent & Innes

2027 Background Saturday Midday Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	1600	10	67	1884	14	30	4	53	25	3	67
Future Volume (veh/h)	59	1600	10	67	1884	14	30	4	53	25	3	67
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	0.99		0.99	0.99		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	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	59	1600	10	67	1884	14	30	4	53	25	3	67
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	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	75	3261	20	85	3287	24	85	26	104	218	8	180
Arrive On Green	0.06	0.86	0.86	0.05	0.65	0.65	0.12	0.12	0.12	0.12	0.12	0.12
Sat Flow, veh/h	1714	5039	31	1714	5032	37	330	210	841	1356	65	1453
Grp Volume(v), veh/h	59	1040	570	67	1226	672	87	0	0	25	0	70
Grp Sat Flow(s),veh/h/ln	1714	1638	1794	1714	1638	1793	1381	0	0	1356	0	1518
Q Serve(g_s), s	3.7	8.4	8.4	4.3	22.8	22.8	2.2	0.0	0.0	0.0	0.0	4.7
Cycle Q Clear(g_c), s	3.7	8.4	8.4	4.3	22.8	22.8	6.9	0.0	0.0	2.2	0.0	4.7
Prop In Lane	1.00		0.02	1.00		0.02	0.34		0.61	1.00		0.96
Lane Grp Cap(c), veh/h	75	2120	1161	85	2140	1171	215	0	0	218	0	188
V/C Ratio(X)	0.78	0.49	0.49	0.78	0.57	0.57	0.40	0.00	0.00	0.11	0.00	0.37
Avail Cap(c_a), veh/h	137	2120	1161	137	2140	1171	504	0	0	488	0	490
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)	0.17	0.17	0.17	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.3	3.3	3.3	51.7	10.6	10.6	45.0	0.0	0.0	43.2	0.0	44.3
Incr Delay (d2), s/veh	3.1	0.1	0.3	14.4	1.1	2.0	1.2	0.0	0.0	0.2	0.0	1.2
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(95%),veh/ln	2.6	3.2	3.5	4.1	14.2	15.7	4.4	0.0	0.0	1.2	0.0	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.4	3.4	3.5	66.1	11.7	12.6	46.2	0.0	0.0	43.4	0.0	45.5
LnGrp LOS	D	A	A	E	B	B	D	A	A	D	A	D
Approach Vol, veh/h		1669			1965			87			95	
Approach Delay, s/veh		5.3			13.9			46.2			44.9	
Approach LOS		A			B			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.7	77.2		21.1	11.0	77.8		21.1				
Change Period (Y+Rc), s	* 6.2	6.0		7.5	* 6.2	6.0		7.5				
Max Green Setting (Gmax), s	* 8.8	46.0		35.5	* 8.8	46.0		35.5				
Max Q Clear Time (g_c+I1), s	6.3	10.4		8.9	5.7	24.8		6.7				
Green Ext Time (p_c), s	0.0	30.1		1.2	0.0	20.0		1.2				

Intersection Summary

HCM 6th Ctrl Delay	11.6
HCM 6th LOS	B

Notes

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

Intersection													
Int Delay, s/veh	1.4												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Vol, veh/h	0	0	0	1	0	102	0	511	20	16	273	324	
Future Vol, veh/h	0	0	0	1	0	102	0	511	20	16	273	324	
Conflicting Peds, #/hr	0	0	2	2	0	0	0	0	1	1	0	0	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free	
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-	
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	0	0	0	0	0	0	0	0	0	0	
Mvmt Flow	0	0	0	1	0	102	0	511	20	16	273	324	
Major/Minor				Minor1		Major1		Major2					
Conflicting Flow All				829		-		267		-		0	
Stage 1				522		-		-		-		-	
Stage 2				307		-		-		-		-	
Critical Hdwy				6.6		-		6.9		-		-	
Critical Hdwy Stg 1				5.8		-		-		-		-	
Critical Hdwy Stg 2				5.4		-		-		-		-	
Follow-up Hdwy				3.5		-		3.3		-		-	
Pot Cap-1 Maneuver				328		0		737		0		-	
Stage 1				566		0		-		0		-	
Stage 2				751		0		-		0		-	
Platoon blocked, %										-		-	
Mov Cap-1 Maneuver				321		0		736		-		-	
Mov Cap-2 Maneuver				321		0		-		-		-	
Stage 1				565		0		-		-		-	
Stage 2				736		0		-		-		-	
Approach				WB		NB		SB					
HCM Control Delay, s				10.7		0		0.5					
HCM LOS				B									
Minor Lane/Major Mvmt		NBT	NBRWBLn1		SBL	SBT							
Capacity (veh/h)		-	-		736	1045		-					
HCM Lane V/C Ratio		-	-		0.139	0.015		-					
HCM Control Delay (s)		-	-		10.7	8.5		-					
HCM Lane LOS		-	-		B	A		-					
HCM 95th %tile Q(veh)		-	-		0.5	0		-					

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	541	222	0
Future Vol, veh/h	0	0	0	541	222	0
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	0	0	0	0
Mvmt Flow	0	0	0	541	222	0

Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	763	222	222	0	-	0
Stage 1	222	-	-	-	-	-
Stage 2	541	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	375	823	1359	-	-	-
Stage 1	820	-	-	-	-	-
Stage 2	588	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	375	823	1359	-	-	-
Mov Cap-2 Maneuver	375	-	-	-	-	-
Stage 1	820	-	-	-	-	-
Stage 2	588	-	-	-	-	-

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

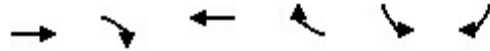
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1359	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection						
Int Delay, s/veh	9.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	450	0	1	9	24	124
Future Vol, veh/h	450	0	1	9	24	124
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	0	0	0	0
Mvmt Flow	450	0	1	9	24	124
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	97	86	148	0	-	0
Stage 1	86	-	-	-	-	-
Stage 2	11	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	907	978	1446	-	-	-
Stage 1	942	-	-	-	-	-
Stage 2	1017	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	906	978	1446	-	-	-
Mov Cap-2 Maneuver	906	-	-	-	-	-
Stage 1	941	-	-	-	-	-
Stage 2	1017	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.8	0.7		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1446	-	906	-	-	
HCM Lane V/C Ratio	0.001	-	0.497	-	-	
HCM Control Delay (s)	7.5	0	12.8	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	2.8	-	-	

Appendix H
Year 2027 Total Conditions Operational
Worksheets

Queues
1: Highway 417 SB Ramp & Innes

Gloucester Costco Business Centre Gas Bar Addition
2027 Total Weekday AM Peak Hour



Lane Group	EBT	EBR	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	762	138	1881	471	407	645
v/c Ratio	0.30	0.14	0.70	0.37	0.87	0.43
Control Delay	5.4	0.9	7.0	1.2	85.9	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.4	0.9	7.0	1.2	85.9	0.9
Queue Length 50th (m)	33.1	0.0	67.0	6.0	65.8	0.0
Queue Length 95th (m)	40.1	4.6	89.8	6.7	#89.1	0.0
Internal Link Dist (m)	248.5		391.3			
Turn Bay Length (m)		45.0		100.0	75.0	75.0
Base Capacity (vph)	2549	1013	2676	1277	491	1502
Starvation Cap Reductn	0	0	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	0.30	0.14	0.70	0.37	0.83	0.43

Intersection Summary

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

1: Highway 417 SB Ramp & Innes

2027 Total Weekday AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗				↖↖		↗
Traffic Volume (veh/h)	0	762	138	0	1881	471	0	0	0	407	0	645
Future Volume (veh/h)	0	762	138	0	1881	471	0	0	0	407	0	645
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	0	1716	1477	0	1786	1758				1772	0	1758
Adj Flow Rate, veh/h	0	762	0	0	1881	0				407	0	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Percent Heavy Veh, %	0	6	23	0	1	3				2	0	3
Cap, veh/h	0	2562		0	2667					453	0	
Arrive On Green	0.00	0.79	0.00	0.00	0.79	0.00				0.14	0.00	0.00
Sat Flow, veh/h	0	3346	1252	0	3483	1490				3274	0	1490
Grp Volume(v), veh/h	0	762	0	0	1881	0				407	0	0
Grp Sat Flow(s),veh/h/ln	0	1630	1252	0	1697	1490				1637	0	1490
Q Serve(g_s), s	0.0	10.4	0.0	0.0	42.6	0.0				19.6	0.0	0.0
Cycle Q Clear(g_c), s	0.0	10.4	0.0	0.0	42.6	0.0				19.6	0.0	0.0
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2562		0	2667					453	0	
V/C Ratio(X)	0.00	0.30		0.00	0.71					0.90	0.00	
Avail Cap(c_a), veh/h	0	2562		0	2667					489	0	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	4.8	0.0	0.0	8.2	0.0				67.8	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.0	1.6	0.0				18.4	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
%ile BackOfQ(95%),veh/ln	0.0	7.3	0.0	0.0	24.2	0.0				14.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	5.1	0.0	0.0	9.8	0.0				86.2	0.0	0.0
LnGrp LOS	A	A		A	A					F	A	
Approach Vol, veh/h		762			1881						407	
Approach Delay, s/veh		5.1			9.8						86.2	
Approach LOS		A			A						F	
Timer - Assigned Phs		2			6			8				
Phs Duration (G+Y+Rc), s		131.8			131.8			28.2				
Change Period (Y+Rc), s		* 6			* 6			6.1				
Max Green Setting (Gmax), s		* 1.2E2			* 1.2E2			23.9				
Max Q Clear Time (g_c+I1), s		12.4			44.6			21.6				
Green Ext Time (p_c), s		21.7			69.9			0.6				
Intersection Summary												
HCM 6th Ctrl Delay			18.8									
HCM 6th LOS			B									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Queues
2: Highway 417 NB Ramp & Innes

Gloucester Costco Business Centre Gas Bar Addition
2027 Total Weekday AM Peak Hour

	→	↘	←	↖	↙	↗
Lane Group	EBT	EBR	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	955	214	1939	1095	412	634
v/c Ratio	0.37	0.20	0.74	0.77	0.81	0.43
Control Delay	3.9	0.4	2.7	12.9	78.1	0.9
Queue Delay	0.0	0.0	0.2	2.1	0.0	0.0
Total Delay	3.9	0.4	2.9	15.0	78.1	0.9
Queue Length 50th (m)	26.5	0.0	8.7	65.6	65.9	0.0
Queue Length 95th (m)	32.5	m0.0	m12.2	m61.6	82.7	0.0
Internal Link Dist (m)	391.3		192.3			
Turn Bay Length (m)				180.0	100.0	75.0
Base Capacity (vph)	2585	1079	2610	1430	594	1473
Starvation Cap Reductn	0	0	117	198	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.20	0.78	0.89	0.69	0.43

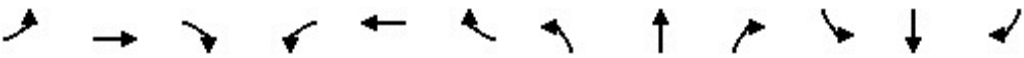
Intersection Summary

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

2: Highway 417 NB Ramp & Innes

2027 Total Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗	↘↘		↗			
Traffic Volume (veh/h)	0	955	214	0	1939	1095	412	0	634	0	0	0
Future Volume (veh/h)	0	955	214	0	1939	1095	412	0	634	0	0	0
Initial Q (Qb), veh	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			
Parking Bus, Adj	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				
Adj Sat Flow, veh/h/ln	0	1758	1617	0	1772	1786	1758	0	1730			
Adj Flow Rate, veh/h	0	955	0	0	1939	0	412	0	0			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	0	3	13	0	2	1	3	0	5			
Cap, veh/h	0	2607		0	2627		474	0				
Arrive On Green	0.00	0.78	0.00	0.00	1.00	0.00	0.15	0.00	0.00			
Sat Flow, veh/h	0	3428	1371	0	3455	1514	3248	0	1466			
Grp Volume(v), veh/h	0	955	0	0	1939	0	412	0	0			
Grp Sat Flow(s),veh/h/ln	0	1670	1371	0	1683	1514	1624	0	1466			
Q Serve(g_s), s	0.0	14.1	0.0	0.0	0.0	0.0	19.9	0.0	0.0			
Cycle Q Clear(g_c), s	0.0	14.1	0.0	0.0	0.0	0.0	19.9	0.0	0.0			
Prop In Lane	0.00		1.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2607		0	2627		474	0				
V/C Ratio(X)	0.00	0.37		0.00	0.74		0.87	0.00				
Avail Cap(c_a), veh/h	0	2607		0	2627		593	0				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	0.00	0.00	0.13	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	0.0	5.4	0.0	0.0	0.0	0.0	66.8	0.0	0.0			
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.0	0.3	0.0	11.1	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			
%ile BackOfQ(95%),veh/ln	0.0	9.5	0.0	0.0	0.2	0.0	14.3	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	5.8	0.0	0.0	0.3	0.0	78.0	0.0	0.0			
LnGrp LOS	A	A		A	A		E	A				
Approach Vol, veh/h		955			1939			412				
Approach Delay, s/veh		5.8			0.3			78.0				
Approach LOS		A			A			E				
Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		130.9		29.1		130.9						
Change Period (Y+Rc), s		* 6		* 5.8		* 6						
Max Green Setting (Gmax), s		* 1.2E2		* 29		* 1.2E2						
Max Q Clear Time (g_c+I1), s		16.1		21.9		2.0						
Green Ext Time (p_c), s		31.3		1.5		100.3						
Intersection Summary												
HCM 6th Ctrl Delay				11.5								
HCM 6th LOS				B								
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.												

Queues
3: Innes Crossing & Innes

Gloucester Costco Business Centre Gas Bar Addition

2027 Total Weekday AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	146	1354	25	2874	48	89	37	3	110
v/c Ratio	1.62	0.46	0.32	1.01	0.05	0.26	0.12	0.01	0.25
Control Delay	372.3	11.7	88.2	14.9	0.3	44.4	48.6	46.0	13.9
Queue Delay	0.0	0.0	0.0	7.9	0.0	0.0	0.0	0.0	0.0
Total Delay	372.3	11.7	88.2	22.8	0.3	44.4	48.6	46.0	13.9
Queue Length 50th (m)	~67.3	79.1	7.9	~49.4	0.1	19.8	9.3	0.7	4.4
Queue Length 95th (m)	#114.5	91.5	m8.0	m46.2	m0.1	36.5	19.6	3.7	20.9
Internal Link Dist (m)		192.3		193.0		122.5		129.2	
Turn Bay Length (m)	50.0		45.0		90.0		45.0		45.0
Base Capacity (vph)	90	2945	90	2846	905	346	311	443	437
Starvation Cap Reductn	0	0	0	65	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	1.62	0.46	0.28	1.03	0.05	0.26	0.12	0.01	0.25

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

3: Innes Crossing & Innes

2027 Total Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	146	1348	6	25	2874	48	48	16	25	37	3	110
Future Volume (veh/h)	146	1348	6	25	2874	48	48	16	25	37	3	110
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	1800	1744	1800	1800	1786	1800	1660	1800	1744	1800	1800	1786
Adj Flow Rate, veh/h	146	1348	6	25	2874	48	48	16	25	37	3	110
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	4	0	0	1	0	10	0	4	0	0	1
Cap, veh/h	90	2985	13	36	2822	881	214	73	99	374	439	368
Arrive On Green	0.02	0.20	0.20	0.02	0.58	0.58	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	1714	4892	22	1714	4876	1521	737	300	405	1386	1800	1512
Grp Volume(v), veh/h	146	875	479	25	2874	48	89	0	0	37	3	110
Grp Sat Flow(s),veh/h/ln	1714	1587	1740	1714	1625	1521	1442	0	0	1386	1800	1512
Q Serve(g_s), s	8.4	38.7	38.7	2.3	92.6	2.2	6.0	0.0	0.0	0.0	0.2	9.5
Cycle Q Clear(g_c), s	8.4	38.7	38.7	2.3	92.6	2.2	7.7	0.0	0.0	3.9	0.2	9.5
Prop In Lane	1.00		0.01	1.00		1.00	0.54		0.28	1.00		1.00
Lane Grp Cap(c), veh/h	90	1937	1062	36	2822	881	386	0	0	374	439	368
V/C Ratio(X)	1.62	0.45	0.45	0.70	1.02	0.05	0.23	0.00	0.00	0.10	0.01	0.30
Avail Cap(c_a), veh/h	90	1937	1062	90	2822	881	386	0	0	374	439	368
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)	0.93	0.93	0.93	0.09	0.09	0.09	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	78.6	40.4	40.4	77.8	33.7	14.7	48.6	0.0	0.0	47.2	45.8	49.3
Incr Delay (d2), s/veh	322.1	0.7	1.3	2.2	10.8	0.0	1.4	0.0	0.0	0.5	0.0	2.1
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(95%),veh/ln	19.7	23.6	25.7	1.6	45.1	1.3	5.8	0.0	0.0	2.3	0.2	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	400.8	41.1	41.7	80.0	44.5	14.7	49.9	0.0	0.0	47.7	45.9	51.4
LnGrp LOS	F	D	D	F	F	B	D	A	A	D	D	D
Approach Vol, veh/h	1500			2947			89			150		
Approach Delay, s/veh	76.3			44.3			49.9			50.4		
Approach LOS	E			D			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.0	104.0		46.0	15.0	99.0		46.0				
Change Period (Y+Rc), s	* 6.6	6.4		7.0	* 6.6	6.4		7.0				
Max Green Setting (Gmax), s	* 8.4	92.6		39.0	* 8.4	92.6		39.0				
Max Q Clear Time (g_c+I1), s	4.3	40.7		9.7	10.4	94.6		11.5				
Green Ext Time (p_c), s	0.0	35.3		1.3	0.0	0.0		0.9				
Intersection Summary												
HCM 6th Ctrl Delay	54.8											
HCM 6th LOS	D											
Notes												

Queues
4: Cryville & Innes

Gloucester Costco Business Centre Gas Bar Addition

2027 Total Weekday AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	115	1032	258	87	2501	504	290	74	80	118	37	150
v/c Ratio	1.02	0.43	0.31	0.80	1.01	0.59	1.74	0.20	0.20	0.69	0.10	0.37
Control Delay	177.7	11.3	0.9	111.0	47.5	11.8	394.9	53.6	4.3	95.3	51.5	16.5
Queue Delay	0.0	0.0	0.0	0.0	34.4	1.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	177.7	11.3	0.9	111.0	81.8	13.0	394.9	53.6	4.3	95.3	51.5	16.5
Queue Length 50th (m)	~39.2	22.3	0.0	26.6	~292.7	78.7	~70.0	19.6	0.0	19.3	9.6	8.0
Queue Length 95th (m)	#82.5	25.0	0.2	m#39.2	#328.8	81.0	#100.9	34.7	6.7	#33.0	20.1	28.6
Internal Link Dist (m)		193.0			155.0			42.3			210.4	
Turn Bay Length (m)	70.0		85.0	45.0		60.0	55.0		45.0	90.0		100.0
Base Capacity (vph)	113	2422	838	112	2484	848	167	365	393	170	387	404
Starvation Cap Reductn	0	0	0	0	203	158	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	134	0	0	0	0	0	0	2
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.43	0.31	0.78	1.10	0.73	1.74	0.20	0.20	0.69	0.10	0.37

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

4: Cryville & Innes

2027 Total Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 			 		
Traffic Volume (veh/h)	115	1032	258	87	2501	504	290	74	80	118	37	150
Future Volume (veh/h)	115	1032	258	87	2501	504	290	74	80	118	37	150
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		0.99	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	1758	1744	1716	1744	1786	1772	1730	1716	1730	1758	1800	1744
Adj Flow Rate, veh/h	115	1032	0	87	2501	0	290	74	80	118	37	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, %	3	4	6	4	1	2	5	6	5	3	0	4
Cap, veh/h	113	2424		105	2462		168	366	310	171	384	
Arrive On Green	0.02	0.17	0.00	0.02	0.17	0.00	0.05	0.21	0.21	0.05	0.21	0.00
Sat Flow, veh/h	1674	4761	1454	1661	4876	1502	3196	1716	1454	3248	1800	1478
Grp Volume(v), veh/h	115	1032	0	87	2501	0	290	74	80	118	37	0
Grp Sat Flow(s),veh/h/ln	1674	1587	1454	1661	1625	1502	1598	1716	1454	1624	1800	1478
Q Serve(g_s), s	10.8	31.1	0.0	8.4	80.8	0.0	8.4	5.7	5.9	5.7	2.6	0.0
Cycle Q Clear(g_c), s	10.8	31.1	0.0	8.4	80.8	0.0	8.4	5.7	5.9	5.7	2.6	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	113	2424		105	2462		168	366	310	171	384	
V/C Ratio(X)	1.02	0.43		0.83	1.02		1.73	0.20	0.26	0.69	0.10	
Avail Cap(c_a), veh/h	113	2424		112	2462		168	366	310	171	384	
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.89	0.89	0.00	0.57	0.57	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	78.2	45.6	0.0	77.4	66.7	0.0	75.8	51.8	34.4	74.5	50.6	0.0
Incr Delay (d2), s/veh	84.6	0.5	0.0	23.2	17.8	0.0	351.5	1.2	2.0	11.3	0.5	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(95%),veh/ln	12.0	19.3	0.0	7.1	48.5	0.0	19.8	4.9	4.4	5.0	2.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	162.9	46.1	0.0	100.6	84.5	0.0	427.3	53.0	36.4	85.9	51.1	0.0
LnGrp LOS	F	D		F	F		F	D	D	F	D	
Approach Vol, veh/h		1147			2588			444			155	
Approach Delay, s/veh		57.8			85.0			294.5			77.6	
Approach LOS		E			F			F			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.3	87.7	15.0	41.0	17.0	87.0	15.0	41.0				
Change Period (Y+Rc), s	* 6.2	* 6.2	* 6.6	6.9	* 6.2	* 6.2	* 6.6	6.9				
Max Green Setting (Gmax), s	* 11	* 81	* 8.4	34.1	* 11	* 81	* 8.4	34.1				
Max Q Clear Time (g_c+I1), s	10.4	33.1	7.7	7.9	12.8	82.8	10.4	4.6				
Green Ext Time (p_c), s	0.0	25.2	0.0	1.5	0.0	0.0	0.0	0.4				

Intersection Summary

HCM 6th Ctrl Delay	99.0
HCM 6th LOS	F

Notes

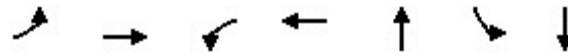
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

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

Queues
5: Stonehenge Crescent & Innes

Gloucester Costco Business Centre Gas Bar Addition

2027 Total Weekday AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	17	1132	63	3015	35	14	84
v/c Ratio	0.23	0.31	0.53	0.75	0.36	0.22	0.56
Control Delay	72.9	2.4	86.9	10.3	40.4	79.6	30.0
Queue Delay	0.0	0.0	0.0	8.2	0.0	0.0	0.0
Total Delay	72.9	2.4	86.9	18.5	40.4	79.6	30.0
Queue Length 50th (m)	5.7	10.0	19.7	168.4	2.5	4.4	1.3
Queue Length 95th (m)	m12.7	13.0	35.4	228.9	14.2	12.1	18.7
Internal Link Dist (m)		155.0		158.8	65.7		136.4
Turn Bay Length (m)	40.0		45.0			25.0	
Base Capacity (vph)	130	3684	142	3997	349	295	398
Starvation Cap Reductn	0	610	0	0	0	0	0
Spillback Cap Reductn	0	0	0	977	0	0	15
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.37	0.44	1.00	0.10	0.05	0.22

Intersection Summary

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

5: Stonehenge Crescent & Innes

2027 Total Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 				
Traffic Volume (veh/h)	17	1123	9	63	3007	8	6	2	27	14	4	80
Future Volume (veh/h)	17	1123	9	63	3007	8	6	2	27	14	4	80
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	0.99		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	1716	1744	1337	1772	1786	1800	1800	1800	1800	1800	1800	1786
Adj Flow Rate, veh/h	17	1123	9	63	3007	8	6	2	27	14	4	80
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, %	6	4	33	2	1	0	0	0	0	0	0	1
Cap, veh/h	27	3544	28	79	3804	10	39	21	114	159	7	148
Arrive On Green	0.01	0.49	0.49	0.05	0.76	0.76	0.10	0.10	0.10	0.10	0.10	0.10
Sat Flow, veh/h	1634	4871	39	1688	5021	13	124	207	1114	1388	72	1443
Grp Volume(v), veh/h	17	732	400	63	1946	1069	35	0	0	14	0	84
Grp Sat Flow(s),veh/h/ln	1634	1587	1737	1688	1625	1783	1444	0	0	1388	0	1515
Q Serve(g_s), s	1.7	22.4	22.4	5.9	57.8	58.0	0.0	0.0	0.0	0.0	0.0	8.4
Cycle Q Clear(g_c), s	1.7	22.4	22.4	5.9	57.8	58.0	8.4	0.0	0.0	2.4	0.0	8.4
Prop In Lane	1.00		0.02	1.00		0.01	0.17		0.77	1.00		0.95
Lane Grp Cap(c), veh/h	27	2309	1263	79	2463	1351	174	0	0	159	0	155
V/C Ratio(X)	0.63	0.32	0.32	0.80	0.79	0.79	0.20	0.00	0.00	0.09	0.00	0.54
Avail Cap(c_a), veh/h	131	2309	1263	135	2463	1351	351	0	0	325	0	336
HCM Platoon Ratio	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.90	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	78.6	16.9	16.9	75.5	11.7	11.7	65.9	0.0	0.0	65.5	0.0	68.2
Incr Delay (d2), s/veh	19.5	0.3	0.6	16.3	2.7	4.8	0.6	0.0	0.0	0.2	0.0	2.9
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(95%),veh/ln	1.6	14.3	15.6	5.5	31.2	34.8	2.5	0.0	0.0	1.0	0.0	6.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	98.2	17.2	17.5	91.8	14.4	16.5	66.5	0.0	0.0	65.7	0.0	71.1
LnGrp LOS	F	B	B	F	B	B	E	A	A	E	A	E
Approach Vol, veh/h	1149			3078			35			98		
Approach Delay, s/veh	18.5			16.7			66.5			70.4		
Approach LOS	B			B			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.7	122.4		23.9	8.9	127.2		23.9				
Change Period (Y+Rc), s	* 6.2	6.0		7.5	* 6.2	6.0		7.5				
Max Green Setting (Gmax), s	* 13	92.0		35.5	* 13	92.0		35.5				
Max Q Clear Time (g_c+I1), s	7.9	24.4		10.4	3.7	60.0		10.4				
Green Ext Time (p_c), s	0.1	33.0		0.3	0.0	31.9		1.3				

Intersection Summary

HCM 6th Ctrl Delay	18.8
HCM 6th LOS	B

Notes

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

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	0	136	0	310	16	49	333	0
Future Vol, veh/h	0	0	0	0	0	136	0	310	16	49	333	0
Conflicting Peds, #/hr	0	0	4	4	0	0	0	0	2	2	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-
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	0	0	0	4	0	7	6	2	7	4
Mvmt Flow	0	0	0	0	0	136	0	310	16	49	333	0
Major/Minor	Minor1			Major1			Major2					
Conflicting Flow All	-			-	-	165	-	0	0	328	0	0
Stage 1	-			-	-	-	-	-	-	-	-	-
Stage 2	-			-	-	-	-	-	-	-	-	-
Critical Hdwy	-			-	-	6.96	-	-	-	4.13	-	-
Critical Hdwy Stg 1	-			-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-			-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-			-	-	3.338	-	-	-	2.219	-	-
Pot Cap-1 Maneuver	0			0	0	845	0	-	-	1230	-	0
Stage 1	0			0	0	-	0	-	-	-	-	0
Stage 2	0			0	0	-	0	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver	-			0	0	843	-	-	-	1228	-	-
Mov Cap-2 Maneuver	-			0	0	-	-	-	-	-	-	-
Stage 1	-			0	0	-	-	-	-	-	-	-
Stage 2	-			0	0	-	-	-	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s				10.1		0		1				
HCM LOS				B								
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT							
Capacity (veh/h)	-	-	843	1228	-							
HCM Lane V/C Ratio	-	-	0.161	0.04	-							
HCM Control Delay (s)	-	-	10.1	8.1	-							
HCM Lane LOS	-	-	B	A	-							
HCM 95th %tile Q(veh)	-	-	0.6	0.1	-							

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	65	0	0	259	168	157
Future Vol, veh/h	65	0	0	259	168	157
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	0	0	0	0
Mvmt Flow	65	0	0	259	168	157
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	506	247	325	0	-	0
Stage 1	247	-	-	-	-	-
Stage 2	259	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	530	797	1246	-	-	-
Stage 1	799	-	-	-	-	-
Stage 2	789	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	530	797	1246	-	-	-
Mov Cap-2 Maneuver	530	-	-	-	-	-
Stage 1	799	-	-	-	-	-
Stage 2	789	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.7	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1246	-	530	-	-	
HCM Lane V/C Ratio	-	-	0.123	-	-	
HCM Control Delay (s)	0	-	12.7	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.4	-	-	

Intersection						
Int Delay, s/veh	5.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	209	0	3	49	22	145
Future Vol, veh/h	209	0	3	49	22	145
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, %	4	0	0	12	27	0
Mvmt Flow	209	0	3	49	22	145
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	150	95	167	0	-	0
Stage 1	95	-	-	-	-	-
Stage 2	55	-	-	-	-	-
Critical Hdwy	6.44	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	837	967	1423	-	-	-
Stage 1	924	-	-	-	-	-
Stage 2	962	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	835	967	1423	-	-	-
Mov Cap-2 Maneuver	835	-	-	-	-	-
Stage 1	922	-	-	-	-	-
Stage 2	962	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.7	0.4		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1423	-	835	-	-	
HCM Lane V/C Ratio	0.002	-	0.25	-	-	
HCM Control Delay (s)	7.5	0	10.7	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	1	-	-	

Queues
1: Highway 417 SB Ramp & Innes

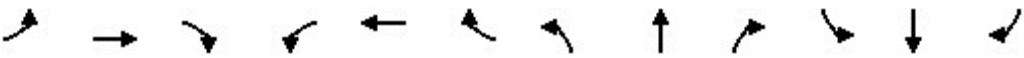
Gloucester Costco Business Centre Gas Bar Addition
2027 Total Weekday PM Peak Hour

	→	↘	←	↖	↘	↖
Lane Group	EBT	EBR	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	1348	362	807	566	986	279
v/c Ratio	0.66	0.37	0.41	0.51	0.92	0.21
Control Delay	21.5	6.9	7.1	2.0	59.3	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.5	6.9	7.1	2.0	59.3	0.4
Queue Length 50th (m)	131.0	18.1	26.7	4.1	132.3	0.0
Queue Length 95th (m)	155.2	37.2	33.1	6.1	160.0	0.0
Internal Link Dist (m)	248.5		391.3			
Turn Bay Length (m)		45.0		100.0	75.0	75.0
Base Capacity (vph)	2030	978	1952	1120	1123	1311
Starvation Cap Reductn	0	0	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	0.66	0.37	0.41	0.51	0.88	0.21
Intersection Summary						

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

1: Highway 417 SB Ramp & Innes

2027 Total Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗				↘↘		↗
Traffic Volume (veh/h)	0	1348	362	0	807	566	0	0	0	986	0	279
Future Volume (veh/h)	0	1348	362	0	807	566	0	0	0	986	0	279
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	0	1786	1758	0	1730	1758				1800	0	1547
Adj Flow Rate, veh/h	0	1348	0	0	807	0				986	0	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Percent Heavy Veh, %	0	1	3	0	5	3				0	0	18
Cap, veh/h	0	2015		0	1951					1064	0	
Arrive On Green	0.00	0.59	0.00	0.00	0.59	0.00				0.32	0.00	0.00
Sat Flow, veh/h	0	3483	1490	0	3373	1490				3326	0	1311
Grp Volume(v), veh/h	0	1348	0	0	807	0				986	0	0
Grp Sat Flow(s),veh/h/ln	0	1697	1490	0	1643	1490				1663	0	1311
Q Serve(g_s), s	0.0	37.5	0.0	0.0	18.5	0.0				40.1	0.0	0.0
Cycle Q Clear(g_c), s	0.0	37.5	0.0	0.0	18.5	0.0				40.1	0.0	0.0
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2015		0	1951					1064	0	
V/C Ratio(X)	0.00	0.67		0.00	0.41					0.93	0.00	
Avail Cap(c_a), veh/h	0	2015		0	1951					1114	0	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	19.2	0.0	0.0	15.3	0.0				46.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.8	0.0	0.0	0.6	0.0				12.7	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
%ile BackOfQ(95%),veh/ln	0.0	23.1	0.0	0.0	12.4	0.0				26.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	21.0	0.0	0.0	16.0	0.0				58.7	0.0	0.0
LnGrp LOS	A	C		A	B					E	A	
Approach Vol, veh/h		1348			807						986	
Approach Delay, s/veh		21.0			16.0						58.7	
Approach LOS		C			B						E	
Timer - Assigned Phs		2			6			8				
Phs Duration (G+Y+Rc), s		89.1			89.1			50.9				
Change Period (Y+Rc), s		* 6			* 6			6.1				
Max Green Setting (Gmax), s		* 81			* 81			46.9				
Max Q Clear Time (g_c+I1), s		39.5			20.5			42.1				
Green Ext Time (p_c), s		31.4			21.1			2.6				

Intersection Summary

HCM 6th Ctrl Delay	31.5
HCM 6th LOS	C

Notes

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

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

Queues
2: Highway 417 NB Ramp & Innes

Gloucester Costco Business Centre Gas Bar Addition
2027 Total Weekday PM Peak Hour

	→	↘	←	↖	↙	↗
Lane Group	EBT	EBR	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	1987	346	1207	745	165	725
v/c Ratio	0.70	0.27	0.43	0.54	0.61	0.48
Control Delay	6.5	0.7	0.6	6.7	69.8	1.1
Queue Delay	0.2	0.0	0.1	0.3	0.0	0.1
Total Delay	6.7	0.7	0.7	7.1	69.8	1.2
Queue Length 50th (m)	134.6	2.5	3.0	47.6	22.9	0.0
Queue Length 95th (m)	150.1	m5.4	4.2	61.6	33.9	0.0
Internal Link Dist (m)	391.3		192.3			
Turn Bay Length (m)				180.0	100.0	75.0
Base Capacity (vph)	2832	1272	2776	1389	587	1513
Starvation Cap Reductn	0	0	437	205	0	0
Spillback Cap Reductn	219	0	0	0	0	95
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.27	0.52	0.63	0.28	0.51

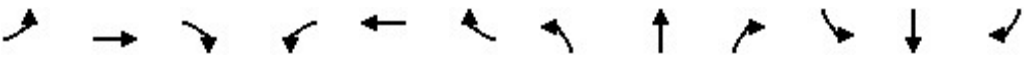
Intersection Summary

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

2: Highway 417 NB Ramp & Innes

2027 Total Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗	↘↘		↗			
Traffic Volume (veh/h)	0	1987	346	0	1207	745	165	0	725	0	0	0
Future Volume (veh/h)	0	1987	346	0	1207	745	165	0	725	0	0	0
Initial Q (Qb), veh	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			
Parking Bus, Adj	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				
Adj Sat Flow, veh/h/ln	0	1800	1772	0	1772	1786	1533	0	1786			
Adj Flow Rate, veh/h	0	1987	0	0	1207	0	165	0	0			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	0	0	2	0	2	1	19	0	1			
Cap, veh/h	0	2867		0	2822		220	0				
Arrive On Green	0.00	0.84	0.00	0.00	1.00	0.00	0.08	0.00	0.00			
Sat Flow, veh/h	0	3510	1502	0	3455	1514	2833	0	1514			
Grp Volume(v), veh/h	0	1987	0	0	1207	0	165	0	0			
Grp Sat Flow(s),veh/h/ln	0	1710	1502	0	1683	1514	1416	0	1514			
Q Serve(g_s), s	0.0	31.4	0.0	0.0	0.0	0.0	8.0	0.0	0.0			
Cycle Q Clear(g_c), s	0.0	31.4	0.0	0.0	0.0	0.0	8.0	0.0	0.0			
Prop In Lane	0.00		1.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2867		0	2822		220	0				
V/C Ratio(X)	0.00	0.69		0.00	0.43		0.75	0.00				
Avail Cap(c_a), veh/h	0	2867		0	2822		591	0				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	0.00	0.00	0.67	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	0.0	4.4	0.0	0.0	0.0	0.0	63.3	0.0	0.0			
Incr Delay (d2), s/veh	0.0	1.4	0.0	0.0	0.3	0.0	5.1	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			
%ile BackOfQ(95%),veh/ln	0.0	17.5	0.0	0.0	0.2	0.0	5.7	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	5.8	0.0	0.0	0.3	0.0	68.4	0.0	0.0			
LnGrp LOS	A	A		A	A		E	A				
Approach Vol, veh/h		1987			1207			165				
Approach Delay, s/veh		5.8			0.3			68.4				
Approach LOS		A			A			E				
Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		123.3		16.7		123.3						
Change Period (Y+Rc), s		* 6		* 5.8		* 6						
Max Green Setting (Gmax), s		* 99		* 29		* 99						
Max Q Clear Time (g_c+I1), s		33.4		10.0		2.0						
Green Ext Time (p_c), s		60.6		0.9		46.3						
Intersection Summary												
HCM 6th Ctrl Delay			6.9									
HCM 6th LOS			A									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.												

Queues
3: Innes Crossing & Innes

Gloucester Costco Business Centre Gas Bar Addition

2027 Total Weekday PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	126	2498	20	1733	70	92	88	14	174
v/c Ratio	0.85	0.90	0.24	0.72	0.09	0.22	0.25	0.03	0.32
Control Delay	111.1	23.7	73.4	11.1	1.8	33.2	41.4	37.1	6.9
Queue Delay	0.0	0.5	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Total Delay	111.1	24.2	73.4	11.3	1.8	33.2	41.4	37.1	6.9
Queue Length 50th (m)	36.7	200.3	5.0	51.9	1.1	15.9	19.0	2.8	0.0
Queue Length 95th (m)	m#63.4	#287.5	m7.6	58.7	m2.4	30.8	33.8	8.4	17.4
Internal Link Dist (m)		192.3		193.0		122.5		129.2	
Turn Bay Length (m)	50.0		45.0		90.0		45.0		45.0
Base Capacity (vph)	153	2761	139	2396	786	414	359	507	550
Starvation Cap Reductn	0	57	0	140	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	0.82	0.92	0.14	0.77	0.09	0.22	0.25	0.03	0.32

Intersection Summary

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

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

3: Innes Crossing & Innes

2027 Total Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	126	2491	7	20	1733	70	43	19	30	88	14	174
Future Volume (veh/h)	126	2491	7	20	1733	70	43	19	30	88	14	174
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		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	1800	1786	1603	1660	1772	1800	1730	1800	1758	1800	1800	1800
Adj Flow Rate, veh/h	126	2491	7	20	1733	70	43	19	30	88	14	174
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	14	10	2	0	5	0	3	0	0	0
Cap, veh/h	148	2807	8	31	2382	746	209	94	129	427	501	424
Arrive On Green	0.09	0.56	0.56	0.02	0.49	0.49	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1714	5020	14	1581	4837	1515	615	339	462	1374	1800	1520
Grp Volume(v), veh/h	126	1613	885	20	1733	70	92	0	0	88	14	174
Grp Sat Flow(s),veh/h/ln	1714	1625	1783	1581	1612	1515	1416	0	0	1374	1800	1520
Q Serve(g_s), s	10.1	60.8	60.8	1.8	39.7	3.4	4.3	0.0	0.0	1.1	0.8	13.1
Cycle Q Clear(g_c), s	10.1	60.8	60.8	1.8	39.7	3.4	6.6	0.0	0.0	7.7	0.8	13.1
Prop In Lane	1.00		0.01	1.00		1.00	0.47		0.33	1.00		1.00
Lane Grp Cap(c), veh/h	148	1818	997	31	2382	746	432	0	0	427	501	424
V/C Ratio(X)	0.85	0.89	0.89	0.66	0.73	0.09	0.21	0.00	0.00	0.21	0.03	0.41
Avail Cap(c_a), veh/h	152	1818	997	140	2382	746	432	0	0	427	501	424
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)	0.72	0.72	0.72	0.65	0.65	0.65	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	63.1	27.0	27.0	68.2	28.1	18.9	38.7	0.0	0.0	39.2	36.7	41.1
Incr Delay (d2), s/veh	26.5	5.1	8.8	14.4	1.3	0.2	1.1	0.0	0.0	1.1	0.1	2.9
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(95%),veh/ln	9.0	33.4	37.5	1.6	22.0	2.5	5.0	0.0	0.0	4.8	0.7	9.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	89.6	32.1	35.8	82.6	29.4	19.1	39.8	0.0	0.0	40.3	36.8	44.1
LnGrp LOS	F	C	D	F	C	B	D	A	A	D	D	D
Approach Vol, veh/h	2624				1823				92		276	
Approach Delay, s/veh	36.1				29.6				39.8		42.5	
Approach LOS	D				C				D		D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.3	84.7		46.0	18.7	75.3		46.0				
Change Period (Y+Rc), s	* 6.6	6.4		7.0	* 6.6	6.4		7.0				
Max Green Setting (Gmax), s	* 12	68.6		39.0	* 12	68.6		39.0				
Max Q Clear Time (g_c+I1), s	3.8	62.8		8.6	12.1	41.7		15.1				
Green Ext Time (p_c), s	0.0	5.7		1.4	0.0	24.6		1.7				

Intersection Summary

HCM 6th Ctrl Delay	34.1
HCM 6th LOS	C

Notes

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

Queues
4: Cryville & Innes

Gloucester Costco Business Centre Gas Bar Addition

2027 Total Weekday PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	80	2105	415	143	1247	218	382	63	170	538	129	186
v/c Ratio	0.67	1.16	0.59	1.08	0.68	0.33	0.92	0.14	0.35	1.31	0.29	0.39
Control Delay	95.1	107.9	12.8	166.6	31.2	4.8	88.0	42.6	11.4	200.9	45.3	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	95.1	107.9	12.8	166.6	31.4	4.8	88.0	42.6	11.4	200.9	45.3	12.0
Queue Length 50th (m)	23.6	~246.9	27.9	~41.4	106.9	14.2	54.6	13.8	4.7	~98.1	29.3	6.0
Queue Length 95th (m)	m26.9	#275.2	m37.7	#90.1	124.3	8.2	#83.6	26.2	23.8	#133.7	48.0	26.4
Internal Link Dist (m)		193.0			155.0			42.3			210.4	
Turn Bay Length (m)	70.0		85.0	45.0		60.0	55.0		45.0	90.0		100.0
Base Capacity (vph)	129	1820	709	133	1830	661	416	443	480	412	443	483
Starvation Cap Reductn	0	0	0	0	74	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	1.16	0.59	1.08	0.71	0.33	0.92	0.14	0.35	1.31	0.29	0.39

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

4: Cryville & Innes

2027 Total Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 			 		
Traffic Volume (veh/h)	80	2105	415	143	1247	218	382	63	170	538	129	186
Future Volume (veh/h)	80	2105	415	143	1247	218	382	63	170	538	129	186
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		0.99	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	1758	1786	1786	1800	1772	1772	1800	1800	1800	1786	1800	1772
Adj Flow Rate, veh/h	80	2105	0	143	1247	0	382	63	170	538	129	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, %	3	1	1	0	2	2	0	0	0	1	0	2
Cap, veh/h	99	1804		132	1878		413	438	368	410	438	
Arrive On Green	0.08	0.49	0.00	0.03	0.13	0.00	0.12	0.24	0.24	0.12	0.24	0.00
Sat Flow, veh/h	1674	4876	1514	1714	4837	1502	3326	1800	1512	3300	1800	1502
Grp Volume(v), veh/h	80	2105	0	143	1247	0	382	63	170	538	129	0
Grp Sat Flow(s),veh/h/ln	1674	1625	1514	1714	1612	1502	1663	1800	1512	1650	1800	1502
Q Serve(g_s), s	6.6	51.8	0.0	10.8	34.4	0.0	15.9	3.8	10.7	17.4	8.2	0.0
Cycle Q Clear(g_c), s	6.6	51.8	0.0	10.8	34.4	0.0	15.9	3.8	10.7	17.4	8.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	99	1804		132	1878		413	438	368	410	438	
V/C Ratio(X)	0.81	1.17		1.08	0.66		0.92	0.14	0.46	1.31	0.29	
Avail Cap(c_a), veh/h	129	1804		132	1878		413	438	368	410	438	
HCM Platoon Ratio	1.33	1.33	1.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.35	0.35	0.00	0.90	0.90	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	63.7	35.6	0.0	68.2	52.3	0.0	60.6	41.5	28.8	61.3	43.1	0.0
Incr Delay (d2), s/veh	9.9	77.5	0.0	97.6	1.7	0.0	26.4	0.7	4.1	156.8	1.7	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(95%),veh/ln	4.9	44.2	0.0	13.6	21.6	0.0	13.4	3.5	8.2	25.9	7.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.6	113.0	0.0	165.9	54.0	0.0	87.0	42.2	32.9	218.1	44.8	0.0
LnGrp LOS	E	F		F	D		F	D	C	F	D	
Approach Vol, veh/h		2185			1390			615			667	
Approach Delay, s/veh		111.6			65.5			67.5			184.6	
Approach LOS		F			E			E			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.0	58.0	24.0	41.0	14.4	60.6	24.0	41.0				
Change Period (Y+Rc), s	* 6.2	* 6.2	* 6.6	6.9	* 6.2	* 6.2	* 6.6	6.9				
Max Green Setting (Gmax), s	* 11	* 52	* 17	34.1	* 11	* 52	* 17	34.1				
Max Q Clear Time (g_c+I1), s	12.8	53.8	19.4	12.7	8.6	36.4	17.9	10.2				
Green Ext Time (p_c), s	0.0	0.0	0.0	1.8	0.1	12.7	0.0	1.7				

Intersection Summary

HCM 6th Ctrl Delay	102.8
HCM 6th LOS	F

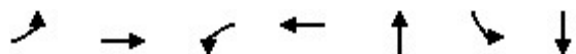
Notes

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

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

Queues
5: Stonehenge Crescent & Innes

Gloucester Costco Business Centre Gas Bar Addition
2027 Total Weekday PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	66	2720	59	1556	96	20	62
v/c Ratio	0.49	0.75	0.47	0.44	0.62	0.30	0.41
Control Delay	73.0	5.4	73.9	8.8	41.1	72.0	24.6
Queue Delay	0.0	0.5	0.0	0.0	0.0	0.0	0.0
Total Delay	73.0	5.9	73.9	8.8	41.1	72.0	24.6
Queue Length 50th (m)	19.3	29.2	16.0	58.3	8.4	5.4	1.3
Queue Length 95th (m)	m16.0	m54.6	30.0	86.9	26.0	13.5	15.2
Internal Link Dist (m)		155.0		158.8	65.7		136.4
Turn Bay Length (m)	40.0		45.0			25.0	
Base Capacity (vph)	139	3636	132	3570	418	260	426
Starvation Cap Reductn	0	418	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.85	0.45	0.44	0.23	0.08	0.15

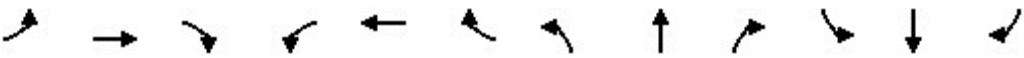
Intersection Summary

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

5: Stonehenge Crescent & Innes

2027 Total Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	66	2713	7	59	1534	22	21	10	65	20	5	57
Future Volume (veh/h)	66	2713	7	59	1534	22	21	10	65	20	5	57
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		0.98	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	1800	1786	1800	1800	1772	1800	1730	1800	1800	1800	1800	1772
Adj Flow Rate, veh/h	66	2713	7	59	1534	22	21	10	65	20	5	57
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	0	0	2	0	5	0	0	0	0	2
Cap, veh/h	83	3458	9	75	3360	48	58	36	131	197	16	177
Arrive On Green	0.05	0.69	0.69	0.04	0.68	0.68	0.13	0.13	0.13	0.13	0.13	0.13
Sat Flow, veh/h	1714	5021	13	1714	4913	70	209	282	1029	1328	122	1395
Grp Volume(v), veh/h	66	1756	964	59	1007	549	96	0	0	20	0	62
Grp Sat Flow(s),veh/h/ln	1714	1625	1783	1714	1612	1758	1520	0	0	1328	0	1517
Q Serve(g_s), s	5.3	51.2	51.3	4.8	20.1	20.1	1.7	0.0	0.0	0.0	0.0	5.2
Cycle Q Clear(g_c), s	5.3	51.2	51.3	4.8	20.1	20.1	8.0	0.0	0.0	2.7	0.0	5.2
Prop In Lane	1.00		0.01	1.00		0.04	0.22		0.68	1.00		0.92
Lane Grp Cap(c), veh/h	83	2239	1228	75	2206	1203	224	0	0	197	0	192
V/C Ratio(X)	0.79	0.78	0.79	0.79	0.46	0.46	0.43	0.00	0.00	0.10	0.00	0.32
Avail Cap(c_a), veh/h	108	2239	1228	108	2206	1203	412	0	0	365	0	385
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)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	65.9	14.7	14.8	66.3	10.2	10.2	56.8	0.0	0.0	54.6	0.0	55.6
Incr Delay (d2), s/veh	2.8	0.3	0.5	21.2	0.7	1.3	1.3	0.0	0.0	0.2	0.0	1.0
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(95%),veh/ln	3.3	22.4	24.6	4.7	12.7	13.9	6.2	0.0	0.0	1.2	0.0	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.8	15.0	15.2	87.5	10.9	11.4	58.1	0.0	0.0	54.8	0.0	56.6
LnGrp LOS	E	B	B	F	B	B	E	A	A	D	A	E
Approach Vol, veh/h	2786			1615			96			82		
Approach Delay, s/veh	16.4			13.8			58.1			56.2		
Approach LOS	B			B			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.3	102.4		25.3	13.0	101.7		25.3				
Change Period (Y+Rc), s	* 6.2	6.0		7.5	* 6.2	6.0		7.5				
Max Green Setting (Gmax), s	* 8.8	76.0		35.5	* 8.8	76.0		35.5				
Max Q Clear Time (g_c+I1), s	6.8	53.3		10.0	7.3	22.1		7.2				
Green Ext Time (p_c), s	0.0	22.6		1.3	0.0	41.4		1.0				

Intersection Summary

HCM 6th Ctrl Delay 17.1

HCM 6th LOS B

Notes

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

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	0	71	0	544	11	49	638	0
Future Vol, veh/h	0	0	0	0	0	71	0	544	11	49	638	0
Conflicting Peds, #/hr	1	0	2	2	0	1	2	0	3	3	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-
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	0	0	0	0	0	0	0	2	0	0
Mvmt Flow	0	0	0	0	0	71	0	544	11	49	638	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	-	282	-	0	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	-	-	4.13
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	-	-	2.219
Pot Cap-1 Maneuver	0	0	721	0	-	1011
Stage 1	0	0	-	0	-	-
Stage 2	0	0	-	0	-	-
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	-	0	718	-	-	1008
Mov Cap-2 Maneuver	-	0	-	-	-	-
Stage 1	-	0	-	-	-	-
Stage 2	-	0	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.6	0	0.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	718	1008
HCM Lane V/C Ratio	-	-	0.099	0.049
HCM Control Delay (s)	-	-	10.6	8.8
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.3	0.2

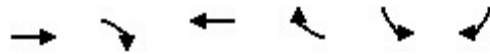
Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	91	0	0	463	314	261
Future Vol, veh/h	91	0	0	463	314	261
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage 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	0	0	0	0
Mvmt Flow	91	0	0	463	314	261
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	908	445	575	0	-	0
Stage 1	445	-	-	-	-	-
Stage 2	463	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	308	617	1008	-	-	-
Stage 1	650	-	-	-	-	-
Stage 2	638	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	308	617	1008	-	-	-
Mov Cap-2 Maneuver	308	-	-	-	-	-
Stage 1	650	-	-	-	-	-
Stage 2	638	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	21.5	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1008	-	308	-	-	
HCM Lane V/C Ratio	-	-	0.295	-	-	
HCM Control Delay (s)	0	-	21.5	-	-	
HCM Lane LOS	A	-	C	-	-	
HCM 95th %tile Q(veh)	0	-	1.2	-	-	

Intersection						
Int Delay, s/veh	8.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	418	5	2	25	18	269
Future Vol, veh/h	418	5	2	25	18	269
Conflicting Peds, #/hr	0	1	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	0	0	0	0
Mvmt Flow	418	5	2	25	18	269
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	182	154	287	0	-	0
Stage 1	153	-	-	-	-	-
Stage 2	29	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	812	897	1287	-	-	-
Stage 1	880	-	-	-	-	-
Stage 2	999	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	810	896	1287	-	-	-
Mov Cap-2 Maneuver	810	-	-	-	-	-
Stage 1	878	-	-	-	-	-
Stage 2	999	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.2	0.6		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1287	-	811	-	-	
HCM Lane V/C Ratio	0.002	-	0.522	-	-	
HCM Control Delay (s)	7.8	0	14.2	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	3.1	-	-	

Queues
1: Highway 417 SB Ramp & Innes

Gloucester Costco Business Centre Gas Bar Addition

2027 Total Saturday Midday Peak Hour



Lane Group	EBT	EBR	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	934	133	944	560	803	242
v/c Ratio	0.45	0.14	0.45	0.49	0.88	0.16
Control Delay	11.7	2.0	11.8	2.4	46.6	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.7	2.0	11.8	2.4	46.6	0.2
Queue Length 50th (m)	49.7	0.0	50.5	0.0	74.7	0.0
Queue Length 95th (m)	63.8	7.0	64.6	12.8	#98.2	0.0
Internal Link Dist (m)	248.5		391.3			
Turn Bay Length (m)		45.0		100.0	75.0	75.0
Base Capacity (vph)	2096	981	2096	1149	969	1502
Starvation Cap Reductn	0	0	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	0.45	0.14	0.45	0.49	0.83	0.16

Intersection Summary

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

1: Highway 417 SB Ramp & Innes

2027 Total Saturday Midday Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗				↖↖		↗
Traffic Volume (veh/h)	0	934	133	0	944	560	0	0	0	803	0	242
Future Volume (veh/h)	0	934	133	0	944	560	0	0	0	803	0	242
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	0	1800	1786	0	1800	1786				1800	0	1758
Adj Flow Rate, veh/h	0	934	0	0	944	0				803	0	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Percent Heavy Veh, %	0	0	1	0	0	1				0	0	3
Cap, veh/h	0	2083		0	2083					898	0	
Arrive On Green	0.00	0.61	0.00	0.00	0.61	0.00				0.27	0.00	0.00
Sat Flow, veh/h	0	3510	1514	0	3510	1514				3326	0	1490
Grp Volume(v), veh/h	0	934	0	0	944	0				803	0	0
Grp Sat Flow(s),veh/h/ln	0	1710	1514	0	1710	1514				1663	0	1490
Q Serve(g_s), s	0.0	14.7	0.0	0.0	14.9	0.0				23.2	0.0	0.0
Cycle Q Clear(g_c), s	0.0	14.7	0.0	0.0	14.9	0.0				23.2	0.0	0.0
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2083		0	2083					898	0	
V/C Ratio(X)	0.00	0.45		0.00	0.45					0.89	0.00	
Avail Cap(c_a), veh/h	0	2083		0	2083					961	0	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	10.5	0.0	0.0	10.6	0.0				35.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.7	0.0	0.0	0.7	0.0				10.3	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
%ile BackOfQ(95%),veh/ln	0.0	10.2	0.0	0.0	10.4	0.0				16.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	11.2	0.0	0.0	11.3	0.0				45.5	0.0	0.0
LnGrp LOS	A	B		A	B					D	A	
Approach Vol, veh/h		934			944						803	
Approach Delay, s/veh		11.2			11.3						45.5	
Approach LOS		B			B						D	
Timer - Assigned Phs		2			6			8				
Phs Duration (G+Y+Rc), s		66.9			66.9			33.1				
Change Period (Y+Rc), s		* 6			* 6			6.1				
Max Green Setting (Gmax), s		* 59			* 59			28.9				
Max Q Clear Time (g_c+I1), s		16.7			16.9			25.2				
Green Ext Time (p_c), s		21.7			21.9			1.8				
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.												
Unsignalized Delay for [EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Queues
2: Highway 417 NB Ramp & Innes

Gloucester Costco Business Centre Gas Bar Addition

2027 Total Saturday Midday Peak Hour

	→	↘	←	↖	↙	↗
Lane Group	EBT	EBR	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	1514	223	1350	988	155	536
v/c Ratio	0.55	0.17	0.49	0.69	0.49	0.35
Control Delay	5.1	0.7	1.5	14.7	52.3	0.6
Queue Delay	0.0	0.0	0.1	1.1	0.0	0.0
Total Delay	5.1	0.7	1.6	15.8	52.3	0.6
Queue Length 50th (m)	48.8	0.0	3.1	88.7	16.5	0.0
Queue Length 95th (m)	71.1	4.6	m5.5	m68.4	26.0	0.0
Internal Link Dist (m)	391.3		192.3			
Turn Bay Length (m)				180.0	100.0	75.0
Base Capacity (vph)	2756	1278	2756	1433	723	1547
Starvation Cap Reductn	0	0	384	221	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.17	0.57	0.82	0.21	0.35
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

2: Highway 417 NB Ramp & Innes

2027 Total Saturday Midday Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗	↖↗		↗			
Traffic Volume (veh/h)	0	1514	223	0	1350	988	155	0	536	0	0	0
Future Volume (veh/h)	0	1514	223	0	1350	988	155	0	536	0	0	0
Initial Q (Qb), veh	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			
Parking Bus, Adj	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				
Adj Sat Flow, veh/h/ln	0	1800	1800	0	1800	1800	1772	0	1800			
Adj Flow Rate, veh/h	0	1514	0	0	1350	0	155	0	0			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	0	0	0	0	0	0	2	0	0			
Cap, veh/h	0	2812		0	2812		231	0				
Arrive On Green	0.00	0.82	0.00	0.00	1.00	0.00	0.07	0.00	0.00			
Sat Flow, veh/h	0	3510	1525	0	3510	1525	3274	0	1525			
Grp Volume(v), veh/h	0	1514	0	0	1350	0	155	0	0			
Grp Sat Flow(s),veh/h/ln	0	1710	1525	0	1710	1525	1637	0	1525			
Q Serve(g_s), s	0.0	15.5	0.0	0.0	0.0	0.0	5.1	0.0	0.0			
Cycle Q Clear(g_c), s	0.0	15.5	0.0	0.0	0.0	0.0	5.1	0.0	0.0			
Prop In Lane	0.00		1.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2812		0	2812		231	0				
V/C Ratio(X)	0.00	0.54		0.00	0.48		0.67	0.00				
Avail Cap(c_a), veh/h	0	2812		0	2812		720	0				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	0.00	0.00	0.09	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	0.0	3.1	0.0	0.0	0.0	0.0	49.9	0.0	0.0			
Incr Delay (d2), s/veh	0.0	0.7	0.0	0.0	0.1	0.0	3.4	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			
%ile BackOfQ(95%),veh/ln	0.0	9.4	0.0	0.0	0.0	0.0	4.1	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	3.9	0.0	0.0	0.1	0.0	53.3	0.0	0.0			
LnGrp LOS	A	A		A	A		D	A				
Approach Vol, veh/h		1514			1350			155				
Approach Delay, s/veh		3.9			0.1			53.3				
Approach LOS		A			A			D				
Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		96.5		13.5		96.5						
Change Period (Y+Rc), s		* 6		* 5.8		* 6						
Max Green Setting (Gmax), s		* 74		* 24		* 74						
Max Q Clear Time (g_c+I1), s		17.5		7.1		2.0						
Green Ext Time (p_c), s		44.2		0.7		46.5						
Intersection Summary												
HCM 6th Ctrl Delay			4.7									
HCM 6th LOS			A									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.												

Queues
3: Innes Crossing & Innes

Gloucester Costco Business Centre Gas Bar Addition

2027 Total Saturday Midday Peak Hour



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	217	1796	26	2057	129	77	112	10	246
v/c Ratio	1.21	0.82	0.23	1.15	0.21	0.14	0.25	0.02	0.35
Control Delay	178.0	28.5	54.5	84.4	2.8	16.4	27.0	23.3	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	178.0	28.5	54.5	84.4	2.8	16.4	27.0	23.3	4.8
Queue Length 50th (m)	~55.7	130.7	5.1	~195.9	2.4	6.7	16.8	1.4	0.3
Queue Length 95th (m)	#102.7	#170.5	m4.7	m42.6	m1.8	16.9	30.8	5.1	16.4
Internal Link Dist (m)		192.3		193.0		122.5		129.2	
Turn Bay Length (m)	50.0		45.0		90.0		45.0		45.0
Base Capacity (vph)	179	2199	179	1788	616	558	455	645	698
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	1.21	0.82	0.15	1.15	0.21	0.14	0.25	0.02	0.35

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

3: Innes Crossing & Innes

2027 Total Saturday Midday Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	217	1785	11	26	2057	129	34	13	30	112	10	246
Future Volume (veh/h)	217	1785	11	26	2057	129	34	13	30	112	10	246
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	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	217	1785	11	26	2057	129	34	13	30	112	10	246
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	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	178	2211	14	43	1769	547	246	99	190	566	638	539
Arrive On Green	0.21	0.88	0.88	0.03	0.48	0.48	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	1714	5039	31	1714	4914	1519	560	281	537	1382	1800	1522
Grp Volume(v), veh/h	217	1160	636	26	2057	129	77	0	0	112	10	246
Grp Sat Flow(s),veh/h/ln	1714	1638	1794	1714	1638	1519	1377	0	0	1382	1800	1522
Q Serve(g_s), s	11.4	16.4	16.4	1.6	39.6	5.5	1.1	0.0	0.0	1.7	0.4	13.7
Cycle Q Clear(g_c), s	11.4	16.4	16.4	1.6	39.6	5.5	3.6	0.0	0.0	5.3	0.4	13.7
Prop In Lane	1.00		0.02	1.00		1.00	0.44		0.39	1.00		1.00
Lane Grp Cap(c), veh/h	178	1437	787	43	1769	547	535	0	0	566	638	539
V/C Ratio(X)	1.22	0.81	0.81	0.61	1.16	0.24	0.14	0.00	0.00	0.20	0.02	0.46
Avail Cap(c_a), veh/h	178	1437	787	178	1769	547	535	0	0	566	638	539
HCM Platoon Ratio	2.00	2.00	2.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.86	0.86	0.86	0.09	0.09	0.09	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.6	4.8	4.8	52.6	28.7	19.8	24.0	0.0	0.0	24.5	23.0	27.3
Incr Delay (d2), s/veh	135.1	4.3	7.6	1.3	73.9	0.1	0.6	0.0	0.0	0.8	0.0	2.8
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(95%),veh/ln	17.8	5.4	7.1	1.2	34.1	2.7	2.8	0.0	0.0	4.2	0.3	9.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	178.7	9.1	12.4	53.9	102.6	19.9	24.6	0.0	0.0	25.3	23.1	30.1
LnGrp LOS	F	A	B	D	F	B	C	A	A	C	C	C
Approach Vol, veh/h	2013			2212			77			368		
Approach Delay, s/veh	28.4			97.2			24.6			28.5		
Approach LOS	C			F			C			C		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.3	54.7		46.0	18.0	46.0		46.0				
Change Period (Y+Rc), s	* 6.6	6.4		7.0	* 6.6	6.4		7.0				
Max Green Setting (Gmax), s	* 11	39.6		39.0	* 11	39.6		39.0				
Max Q Clear Time (g_c+I1), s	3.6	18.4		5.6	13.4	41.6		15.7				
Green Ext Time (p_c), s	0.0	19.8		1.2	0.0	0.0		2.3				
Intersection Summary												
HCM 6th Ctrl Delay	60.9											
HCM 6th LOS	E											
Notes												

Queues
4: Cryville & Innes

Gloucester Costco Business Centre Gas Bar Addition

2027 Total Saturday Midday Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	102	1277	535	227	1511	256	520	96	230	227	84	168
v/c Ratio	0.58	1.09	0.70	1.07	1.18	0.50	1.64	0.17	0.37	0.73	0.15	0.29
Control Delay	69.0	90.0	17.7	131.9	119.6	8.5	334.8	28.7	5.5	62.6	28.5	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.0	90.0	17.7	131.9	119.6	8.5	334.8	28.7	5.5	62.6	28.5	5.7
Queue Length 50th (m)	23.6	~107.4	47.8	~50.8	~145.7	12.5	~83.4	15.0	0.0	24.8	13.0	0.0
Queue Length 95th (m)	m29.8	#136.4	m78.5	#102.5	#176.5	14.5	#116.1	27.5	16.9	#40.4	24.7	14.6
Internal Link Dist (m)		193.0			155.0			42.3			210.4	
Turn Bay Length (m)	70.0		85.0	45.0		60.0	55.0		45.0	90.0		100.0
Base Capacity (vph)	213	1174	761	213	1281	513	317	564	623	313	558	584
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	1.09	0.70	1.07	1.18	0.50	1.64	0.17	0.37	0.73	0.15	0.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

4: Cryville & Innes

2027 Total Saturday Midday Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 			 		
Traffic Volume (veh/h)	102	1277	535	227	1511	256	520	96	230	227	84	168
Future Volume (veh/h)	102	1277	535	227	1511	256	520	96	230	227	84	168
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		0.99	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	1800	1800	1800	1800	1800	1786	1800	1800	1786	1786	1786	1786
Adj Flow Rate, veh/h	102	1277	0	227	1511	0	520	96	230	227	84	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	0	0	0	0	1	0	0	1	1	1	1
Cap, veh/h	129	1161		212	1401		314	558	465	312	554	
Arrive On Green	0.05	0.16	0.00	0.16	0.38	0.00	0.09	0.31	0.31	0.09	0.31	0.00
Sat Flow, veh/h	1714	4914	1525	1714	4914	1514	3326	1800	1500	3300	1786	1514
Grp Volume(v), veh/h	102	1277	0	227	1511	0	520	96	230	227	84	0
Grp Sat Flow(s),veh/h/ln	1714	1638	1525	1714	1638	1514	1663	1800	1500	1650	1786	1514
Q Serve(g_s), s	6.5	26.0	0.0	13.6	31.4	0.0	10.4	4.3	9.9	7.4	3.7	0.0
Cycle Q Clear(g_c), s	6.5	26.0	0.0	13.6	31.4	0.0	10.4	4.3	9.9	7.4	3.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	129	1161		212	1401		314	558	465	312	554	
V/C Ratio(X)	0.79	1.10		1.07	1.08		1.65	0.17	0.49	0.73	0.15	
Avail Cap(c_a), veh/h	212	1161		212	1401		314	558	465	312	554	
HCM Platoon Ratio	0.67	0.67	0.67	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.53	0.53	0.00	0.83	0.83	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	51.4	46.3	0.0	46.0	34.2	0.0	49.8	27.7	16.0	48.4	27.5	0.0
Incr Delay (d2), s/veh	5.8	52.5	0.0	76.4	46.6	0.0	308.0	0.7	3.7	8.3	0.6	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(95%),veh/ln	5.3	23.2	0.0	15.7	26.4	0.0	29.1	3.8	7.7	6.5	3.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.2	98.8	0.0	122.4	80.7	0.0	357.8	28.3	19.7	56.7	28.1	0.0
LnGrp LOS	E	F		F	F		F	C	B	E	C	
Approach Vol, veh/h		1379			1738			846			311	
Approach Delay, s/veh		95.7			86.2			228.5			49.0	
Approach LOS		F			F			F			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.8	32.2	17.0	41.0	14.4	37.6	17.0	41.0				
Change Period (Y+Rc), s	* 6.2	* 6.2	* 6.6	6.9	* 6.2	* 6.2	* 6.6	6.9				
Max Green Setting (Gmax), s	* 14	* 26	* 10	34.1	* 14	* 26	* 10	34.1				
Max Q Clear Time (g_c+I1), s	15.6	28.0	9.4	11.9	8.5	33.4	12.4	5.7				
Green Ext Time (p_c), s	0.0	0.0	0.1	2.8	0.2	0.0	0.0	1.1				

Intersection Summary

HCM 6th Ctrl Delay	114.7
HCM 6th LOS	F

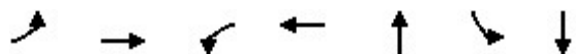
Notes

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

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

Queues
5: Stonehenge Crescent & Innes

Gloucester Costco Business Centre Gas Bar Addition
2027 Total Saturday Midday Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	59	1630	67	1918	87	25	70
v/c Ratio	0.41	0.46	0.45	0.54	0.54	0.23	0.38
Control Delay	56.5	2.6	56.2	10.8	34.6	50.9	18.3
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	56.5	2.6	56.2	10.8	34.6	50.9	18.3
Queue Length 50th (m)	13.6	5.6	13.9	74.5	7.1	5.2	0.6
Queue Length 95th (m)	m15.1	m23.4	26.9	111.2	21.9	13.1	13.4
Internal Link Dist (m)		155.0		158.8	65.7		136.4
Turn Bay Length (m)	40.0		45.0			25.0	
Base Capacity (vph)	156	3531	162	3551	492	449	540
Starvation Cap Reductn	0	408	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.52	0.41	0.54	0.18	0.06	0.13

Intersection Summary

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

5: Stonehenge Crescent & Innes

2027 Total Saturday Midday Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 				
Traffic Volume (veh/h)	59	1620	10	67	1904	14	30	4	53	25	3	67
Future Volume (veh/h)	59	1620	10	67	1904	14	30	4	53	25	3	67
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	0.99		0.99	0.99		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	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	59	1620	10	67	1904	14	30	4	53	25	3	67
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	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	75	3261	20	85	3287	24	85	26	104	218	8	180
Arrive On Green	0.06	0.86	0.86	0.05	0.65	0.65	0.12	0.12	0.12	0.12	0.12	0.12
Sat Flow, veh/h	1714	5039	31	1714	5032	37	330	210	841	1356	65	1453
Grp Volume(v), veh/h	59	1053	577	67	1239	679	87	0	0	25	0	70
Grp Sat Flow(s),veh/h/ln	1714	1638	1794	1714	1638	1793	1381	0	0	1356	0	1518
Q Serve(g_s), s	3.7	8.6	8.6	4.3	23.2	23.2	2.2	0.0	0.0	0.0	0.0	4.7
Cycle Q Clear(g_c), s	3.7	8.6	8.6	4.3	23.2	23.2	6.9	0.0	0.0	2.2	0.0	4.7
Prop In Lane	1.00		0.02	1.00		0.02	0.34		0.61	1.00		0.96
Lane Grp Cap(c), veh/h	75	2120	1161	85	2140	1171	215	0	0	218	0	188
V/C Ratio(X)	0.78	0.50	0.50	0.78	0.58	0.58	0.40	0.00	0.00	0.11	0.00	0.37
Avail Cap(c_a), veh/h	137	2120	1161	137	2140	1171	504	0	0	488	0	490
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)	0.22	0.22	0.22	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.3	3.3	3.3	51.7	10.6	10.6	45.0	0.0	0.0	43.2	0.0	44.3
Incr Delay (d2), s/veh	4.0	0.2	0.3	14.4	1.2	2.1	1.2	0.0	0.0	0.2	0.0	1.2
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(95%),veh/ln	2.8	3.4	3.7	4.1	14.4	15.9	4.4	0.0	0.0	1.2	0.0	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.3	3.5	3.6	66.1	11.8	12.7	46.2	0.0	0.0	43.4	0.0	45.5
LnGrp LOS	E	A	A	E	B	B	D	A	A	D	A	D
Approach Vol, veh/h	1689				1985				87		95	
Approach Delay, s/veh	5.3				13.9				46.2		44.9	
Approach LOS	A				B				D		D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.7	77.2		21.1	11.0	77.8		21.1				
Change Period (Y+Rc), s	* 6.2	6.0		7.5	* 6.2	6.0		7.5				
Max Green Setting (Gmax), s	* 8.8	46.0		35.5	* 8.8	46.0		35.5				
Max Q Clear Time (g_c+I1), s	6.3	10.6		8.9	5.7	25.2		6.7				
Green Ext Time (p_c), s	0.0	30.2		1.2	0.0	19.7		1.2				

Intersection Summary

HCM 6th Ctrl Delay	11.7
HCM 6th LOS	B

Notes

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

Intersection													
Int Delay, s/veh	0.8												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Vol, veh/h	0	0	0	1	0	102	0	744	20	16	830	0	
Future Vol, veh/h	0	0	0	1	0	102	0	744	20	16	830	0	
Conflicting Peds, #/hr	0	0	2	2	0	0	0	0	1	1	0	0	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free	
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-	
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	0	0	0	0	0	0	0	0	0	0	
Mvmt Flow	0	0	0	1	0	102	0	744	20	16	830	0	
Major/Minor				Minor1		Major1			Major2				
Conflicting Flow All				1619		-	383	-	0	0	765	0	0
Stage 1				755		-	-	-	-	-	-	-	-
Stage 2				864		-	-	-	-	-	-	-	-
Critical Hdwy				6.6		-	6.9	-	-	-	4.1	-	-
Critical Hdwy Stg 1				5.8		-	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.4		-	-	-	-	-	-	-	-
Follow-up Hdwy				3.5		-	3.3	-	-	-	2.2	-	-
Pot Cap-1 Maneuver				105		0	621	0	-	-	857	-	0
Stage 1				430		0	-	0	-	-	-	-	0
Stage 2				416		0	-	0	-	-	-	-	0
Platoon blocked, %									-	-		-	
Mov Cap-1 Maneuver				101		0	620	-	-	-	856	-	-
Mov Cap-2 Maneuver				101		0	-	-	-	-	-	-	-
Stage 1				430		0	-	-	-	-	-	-	-
Stage 2				401		0	-	-	-	-	-	-	-
Approach				WB		NB			SB				
HCM Control Delay, s				11.9		0			0.2				
HCM LOS				B									
Minor Lane/Major Mvmt		NBT	NBRWBLn1	SBL	SBT								
Capacity (veh/h)		-	-	620	856	-							
HCM Lane V/C Ratio		-	-	0.165	0.019	-							
HCM Control Delay (s)		-	-	11.9	9.3	-							
HCM Lane LOS		-	-	B	A	-							
HCM 95th %tile Q(veh)		-	-	0.6	0.1	-							

Intersection						
Int Delay, s/veh	2.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	93	0	0	681	466	313
Future Vol, veh/h	93	0	0	681	466	313
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	0	0	0	0
Mvmt Flow	93	0	0	681	466	313
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1304	623	779	0	-	0
Stage 1	623	-	-	-	-	-
Stage 2	681	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	179	490	847	-	-	-
Stage 1	539	-	-	-	-	-
Stage 2	506	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	179	490	847	-	-	-
Mov Cap-2 Maneuver	179	-	-	-	-	-
Stage 1	539	-	-	-	-	-
Stage 2	506	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	45	0		0		
HCM LOS	E					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	847	-	179	-	-	
HCM Lane V/C Ratio	-	-	0.52	-	-	
HCM Control Delay (s)	0	-	45	-	-	
HCM Lane LOS	A	-	E	-	-	
HCM 95th %tile Q(veh)	0	-	2.6	-	-	

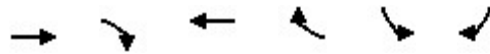
Intersection						
Int Delay, s/veh	13.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	590	0	1	9	24	368
Future Vol, veh/h	590	0	1	9	24	368
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	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	0	0	0	0
Mvmt Flow	590	0	1	9	24	368
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	219	208	392	0	-	0
Stage 1	208	-	-	-	-	-
Stage 2	11	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	774	837	1178	-	-	-
Stage 1	832	-	-	-	-	-
Stage 2	1017	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	773	837	1178	-	-	-
Mov Cap-2 Maneuver	773	-	-	-	-	-
Stage 1	831	-	-	-	-	-
Stage 2	1017	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	23	0.8		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1178	-	773	-	-	
HCM Lane V/C Ratio	0.001	-	0.763	-	-	
HCM Control Delay (s)	8.1	0	23	-	-	
HCM Lane LOS	A	A	C	-	-	
HCM 95th %tile Q(veh)	0	-	7.3	-	-	

Appendix I
Year 2032 Background Conditions Operational
Worksheets

Queues
1: Highway 417 SB Ramp & Innes

Gloucester Costco Business Centre Gas Bar Addition

2032 Background Weekday AM Peak Hour



Lane Group	EBT	EBR	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	836	153	2071	473	403	712
v/c Ratio	0.33	0.15	0.77	0.37	0.86	0.47
Control Delay	5.6	0.9	8.1	1.0	85.5	1.1
Queue Delay	0.0	0.0	0.3	0.0	0.0	0.0
Total Delay	5.6	0.9	8.3	1.0	85.5	1.1
Queue Length 50th (m)	37.5	0.0	78.6	4.8	65.0	0.0
Queue Length 95th (m)	45.2	4.8	119.1	5.4	#87.7	0.0
Internal Link Dist (m)	248.5		391.3			
Turn Bay Length (m)		45.0		100.0	75.0	75.0
Base Capacity (vph)	2551	1017	2678	1278	491	1502
Starvation Cap Reductn	0	0	144	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	0.33	0.15	0.82	0.37	0.82	0.47

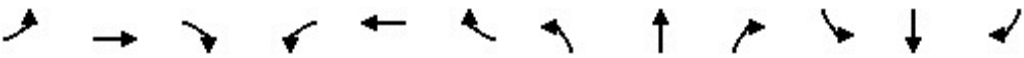
Intersection Summary

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

1: Highway 417 SB Ramp & Innes

2032 Background Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗				↘↘		↗
Traffic Volume (veh/h)	0	836	153	0	2071	473	0	0	0	403	0	712
Future Volume (veh/h)	0	836	153	0	2071	473	0	0	0	403	0	712
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	0	1716	1477	0	1786	1758				1772	0	1758
Adj Flow Rate, veh/h	0	836	0	0	2071	0				403	0	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Percent Heavy Veh, %	0	6	23	0	1	3				2	0	3
Cap, veh/h	0	2565		0	2670					450	0	
Arrive On Green	0.00	0.79	0.00	0.00	0.79	0.00				0.14	0.00	0.00
Sat Flow, veh/h	0	3346	1252	0	3483	1490				3274	0	1490
Grp Volume(v), veh/h	0	836	0	0	2071	0				403	0	0
Grp Sat Flow(s),veh/h/ln	0	1630	1252	0	1697	1490				1637	0	1490
Q Serve(g_s), s	0.0	11.8	0.0	0.0	53.4	0.0				19.4	0.0	0.0
Cycle Q Clear(g_c), s	0.0	11.8	0.0	0.0	53.4	0.0				19.4	0.0	0.0
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2565		0	2670					450	0	
V/C Ratio(X)	0.00	0.33		0.00	0.78					0.90	0.00	
Avail Cap(c_a), veh/h	0	2565		0	2670					489	0	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	4.9	0.0	0.0	9.3	0.0				67.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.0	2.3	0.0				18.0	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
%ile BackOfQ(95%),veh/ln	0.0	8.1	0.0	0.0	29.5	0.0				14.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	5.2	0.0	0.0	11.6	0.0				85.9	0.0	0.0
LnGrp LOS	A	A		A	B					F	A	
Approach Vol, veh/h		836			2071						403	
Approach Delay, s/veh		5.2			11.6						85.9	
Approach LOS		A			B						F	
Timer - Assigned Phs		2			6			8				
Phs Duration (G+Y+Rc), s		131.9			131.9			28.1				
Change Period (Y+Rc), s		* 6			* 6			6.1				
Max Green Setting (Gmax), s		* 1.2E2			* 1.2E2			23.9				
Max Q Clear Time (g_c+I1), s		13.8			55.4			21.4				
Green Ext Time (p_c), s		25.3			64.4			0.6				

Intersection Summary

HCM 6th Ctrl Delay	19.0
HCM 6th LOS	B

Notes

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

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

Queues
2: Highway 417 NB Ramp & Innes

Gloucester Costco Business Centre Gas Bar Addition
2032 Background Weekday AM Peak Hour

	→	↘	←	↖	↙	↗
Lane Group	EBT	EBR	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	1003	237	2089	1162	455	654
v/c Ratio	0.39	0.22	0.81	0.81	0.85	0.44
Control Delay	4.4	0.4	5.4	15.2	80.0	1.0
Queue Delay	0.0	0.0	0.3	4.5	0.0	0.0
Total Delay	4.4	0.4	5.7	19.7	80.0	1.0
Queue Length 50th (m)	31.3	0.0	13.9	88.3	72.8	0.0
Queue Length 95th (m)	35.2	m0.0	m12.8	m326.1	91.7	0.0
Internal Link Dist (m)	391.3		192.3			
Turn Bay Length (m)				180.0	100.0	75.0
Base Capacity (vph)	2555	1075	2581	1426	594	1473
Starvation Cap Reductn	0	0	105	198	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.22	0.84	0.95	0.77	0.44
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

2: Highway 417 NB Ramp & Innes

2032 Background Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗	↗↗		↗			
Traffic Volume (veh/h)	0	1003	237	0	2089	1162	455	0	654	0	0	0
Future Volume (veh/h)	0	1003	237	0	2089	1162	455	0	654	0	0	0
Initial Q (Qb), veh	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			
Parking Bus, Adj	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				
Adj Sat Flow, veh/h/ln	0	1758	1617	0	1772	1786	1758	0	1730			
Adj Flow Rate, veh/h	0	1003	0	0	2089	0	455	0	0			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	0	3	13	0	2	1	3	0	5			
Cap, veh/h	0	2567		0	2587		513	0				
Arrive On Green	0.00	0.77	0.00	0.00	1.00	0.00	0.16	0.00	0.00			
Sat Flow, veh/h	0	3428	1371	0	3455	1514	3248	0	1466			
Grp Volume(v), veh/h	0	1003	0	0	2089	0	455	0	0			
Grp Sat Flow(s),veh/h/ln	0	1670	1371	0	1683	1514	1624	0	1466			
Q Serve(g_s), s	0.0	15.9	0.0	0.0	0.0	0.0	22.0	0.0	0.0			
Cycle Q Clear(g_c), s	0.0	15.9	0.0	0.0	0.0	0.0	22.0	0.0	0.0			
Prop In Lane	0.00		1.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2567		0	2587		513	0				
V/C Ratio(X)	0.00	0.39		0.00	0.81		0.89	0.00				
Avail Cap(c_a), veh/h	0	2567		0	2587		593	0				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	0.00	0.00	0.09	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	0.0	6.1	0.0	0.0	0.0	0.0	66.0	0.0	0.0			
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.0	0.3	0.0	13.9	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			
%ile BackOfQ(95%),veh/ln	0.0	10.6	0.0	0.0	0.2	0.0	15.8	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	6.6	0.0	0.0	0.3	0.0	79.8	0.0	0.0			
LnGrp LOS	A	A		A	A		E	A				
Approach Vol, veh/h		1003			2089			455				
Approach Delay, s/veh		6.6			0.3			79.8				
Approach LOS		A			A			E				
Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		129.0		31.0		129.0						
Change Period (Y+Rc), s		* 6		* 5.8		* 6						
Max Green Setting (Gmax), s		* 1.2E2		* 29		* 1.2E2						
Max Q Clear Time (g_c+I1), s		17.9		24.0		2.0						
Green Ext Time (p_c), s		34.0		1.3		106.0						
Intersection Summary												
HCM 6th Ctrl Delay				12.3								
HCM 6th LOS				B								
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.												

Queues
3: Innes Crossing & Innes

Gloucester Costco Business Centre Gas Bar Addition

2032 Background Weekday AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	161	1396	25	3075	53	89	41	3	122
v/c Ratio	1.79	0.47	0.32	1.08	0.06	0.26	0.13	0.01	0.28
Control Delay	437.8	11.8	91.8	45.7	0.1	44.4	48.8	46.0	16.7
Queue Delay	0.0	0.1	0.0	8.5	0.0	0.0	0.0	0.0	0.0
Total Delay	437.8	11.8	91.8	54.2	0.1	44.4	48.8	46.0	16.7
Queue Length 50th (m)	~78.0	84.9	8.1	~399.7	0.0	19.8	10.3	0.7	7.7
Queue Length 95th (m)	#126.6	96.1	m7.8	m33.2	m0.0	36.5	21.3	3.7	25.3
Internal Link Dist (m)		192.3		193.0		122.5		129.2	
Turn Bay Length (m)	50.0		45.0		90.0		45.0		45.0
Base Capacity (vph)	90	2945	90	2846	905	346	311	443	437
Starvation Cap Reductn	0	333	0	58	0	0	0	0	0
Spillback Cap Reductn	0	0	0	113	0	0	0	0	2
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.79	0.53	0.28	1.13	0.06	0.26	0.13	0.01	0.28

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

3: Innes Crossing & Innes

2032 Background Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 			 	
Traffic Volume (veh/h)	161	1390	6	25	3075	53	48	16	25	41	3	122
Future Volume (veh/h)	161	1390	6	25	3075	53	48	16	25	41	3	122
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	1800	1744	1800	1800	1786	1800	1660	1800	1744	1800	1800	1786
Adj Flow Rate, veh/h	161	1390	6	25	3075	53	48	16	25	41	3	122
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	4	0	0	1	0	10	0	4	0	0	1
Cap, veh/h	90	2986	13	36	2822	881	213	73	98	374	439	368
Arrive On Green	0.02	0.20	0.20	0.02	0.58	0.58	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	1714	4893	21	1714	4876	1521	732	298	403	1386	1800	1512
Grp Volume(v), veh/h	161	902	494	25	3075	53	89	0	0	41	3	122
Grp Sat Flow(s),veh/h/ln	1714	1587	1740	1714	1625	1521	1433	0	0	1386	1800	1512
Q Serve(g_s), s	8.4	40.1	40.1	2.3	92.6	2.4	6.0	0.0	0.0	0.0	0.2	10.6
Cycle Q Clear(g_c), s	8.4	40.1	40.1	2.3	92.6	2.4	7.7	0.0	0.0	4.3	0.2	10.6
Prop In Lane	1.00		0.01	1.00		1.00	0.54		0.28	1.00		1.00
Lane Grp Cap(c), veh/h	90	1937	1062	36	2822	881	384	0	0	374	439	368
V/C Ratio(X)	1.79	0.47	0.47	0.70	1.09	0.06	0.23	0.00	0.00	0.11	0.01	0.33
Avail Cap(c_a), veh/h	90	1937	1062	90	2822	881	384	0	0	374	439	368
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)	0.92	0.92	0.92	0.09	0.09	0.09	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	78.6	40.9	40.9	77.8	33.7	14.7	48.6	0.0	0.0	47.4	45.8	49.8
Incr Delay (d2), s/veh	392.7	0.7	1.4	2.2	41.1	0.0	1.4	0.0	0.0	0.6	0.0	2.4
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(95%),veh/ln	22.4	24.2	26.4	1.6	57.1	1.4	5.8	0.0	0.0	2.6	0.2	8.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	471.3	41.6	42.2	80.0	74.8	14.7	50.0	0.0	0.0	48.0	45.9	52.2
LnGrp LOS	F	D	D	F	F	B	D	A	A	D	D	D
Approach Vol, veh/h		1557			3153			89			166	
Approach Delay, s/veh		86.3			73.8			50.0			51.0	
Approach LOS		F			E			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.0	104.0		46.0	15.0	99.0		46.0				
Change Period (Y+Rc), s	* 6.6	6.4		7.0	* 6.6	6.4		7.0				
Max Green Setting (Gmax), s	* 8.4	92.6		39.0	* 8.4	92.6		39.0				
Max Q Clear Time (g_c+I1), s	4.3	42.1		9.7	10.4	94.6		12.6				
Green Ext Time (p_c), s	0.0	35.7		1.3	0.0	0.0		1.0				

Intersection Summary

HCM 6th Ctrl Delay	76.5
HCM 6th LOS	E

Notes

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

Queues
4: Cryville & Innes

Gloucester Costco Business Centre Gas Bar Addition

2032 Background Weekday AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	128	1169	142	50	2791	556	171	71	41	132	29	169
v/c Ratio	1.13	0.46	0.18	0.52	1.12	0.66	1.02	0.19	0.10	0.78	0.07	0.42
Control Delay	201.1	11.1	0.5	93.1	88.8	12.1	147.5	53.4	0.5	102.9	51.1	20.8
Queue Delay	0.0	0.0	0.0	0.0	0.2	1.9	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	201.1	11.1	0.5	93.1	89.0	14.0	147.5	53.4	0.5	102.9	51.1	20.8
Queue Length 50th (m)	~48.0	25.8	0.2	15.0	~374.9	85.7	~29.5	18.7	0.0	21.8	7.5	13.1
Queue Length 95th (m)	#91.9	28.5	1.0	m18.3	#394.9	80.4	#55.0	33.5	0.0	#38.9	16.8	35.9
Internal Link Dist (m)		193.0			155.0			42.3			210.4	
Turn Bay Length (m)	70.0		85.0	45.0		60.0	55.0		45.0	90.0		100.0
Base Capacity (vph)	113	2531	810	112	2484	847	167	365	393	170	387	404
Starvation Cap Reductn	0	0	0	0	189	157	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	96	0	0	0	0	0	0	2
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.13	0.46	0.18	0.45	1.22	0.81	1.02	0.19	0.10	0.78	0.07	0.42

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

4: Cryville & Innes

2032 Background Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	128	1169	142	50	2791	556	171	71	41	132	29	169
Future Volume (veh/h)	128	1169	142	50	2791	556	171	71	41	132	29	169
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		0.99	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	1758	1744	1716	1744	1786	1772	1730	1716	1730	1758	1800	1744
Adj Flow Rate, veh/h	128	1169	0	50	2791	0	171	71	41	132	29	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, %	3	4	6	4	1	2	5	6	5	3	0	4
Cap, veh/h	113	2544		63	2462		168	366	310	171	384	
Arrive On Green	0.02	0.18	0.00	0.01	0.17	0.00	0.05	0.21	0.21	0.05	0.21	0.00
Sat Flow, veh/h	1674	4761	1454	1661	4876	1502	3196	1716	1454	3248	1800	1478
Grp Volume(v), veh/h	128	1169	0	50	2791	0	171	71	41	132	29	0
Grp Sat Flow(s),veh/h/ln	1674	1587	1454	1661	1625	1502	1598	1716	1454	1624	1800	1478
Q Serve(g_s), s	10.8	35.2	0.0	4.8	80.8	0.0	8.4	5.4	3.0	6.4	2.1	0.0
Cycle Q Clear(g_c), s	10.8	35.2	0.0	4.8	80.8	0.0	8.4	5.4	3.0	6.4	2.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	113	2544		63	2462		168	366	310	171	384	
V/C Ratio(X)	1.13	0.46		0.79	1.13		1.02	0.19	0.13	0.77	0.08	
Avail Cap(c_a), veh/h	113	2544		112	2462		168	366	310	171	384	
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.88	0.88	0.00	0.44	0.44	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	78.2	45.2	0.0	78.4	66.7	0.0	75.8	51.7	33.5	74.9	50.3	0.0
Incr Delay (d2), s/veh	119.5	0.5	0.0	9.2	62.7	0.0	74.6	1.2	0.9	19.6	0.4	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(95%),veh/ln	13.8	21.5	0.0	4.0	64.3	0.0	9.2	4.7	2.2	5.9	1.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	197.7	45.7	0.0	87.6	129.4	0.0	150.4	52.9	34.3	94.5	50.7	0.0
LnGrp LOS	F	D		F	F		F	D	C	F	D	
Approach Vol, veh/h		1297			2841			283			161	
Approach Delay, s/veh		60.7			128.6			109.1			86.6	
Approach LOS		E			F			F			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.3	91.7	15.0	41.0	17.0	87.0	15.0	41.0				
Change Period (Y+Rc), s	* 6.2	* 6.2	* 6.6	6.9	* 6.2	* 6.2	* 6.6	6.9				
Max Green Setting (Gmax), s	* 11	* 81	* 8.4	34.1	* 11	* 81	* 8.4	34.1				
Max Q Clear Time (g_c+I1), s	6.8	37.2	8.4	7.4	12.8	82.8	10.4	4.1				
Green Ext Time (p_c), s	0.0	27.4	0.0	1.2	0.0	0.0	0.0	0.3				

Intersection Summary

HCM 6th Ctrl Delay	106.7
HCM 6th LOS	F

Notes

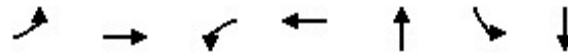
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

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

Queues
5: Stonehenge Crescent & Innes

Gloucester Costco Business Centre Gas Bar Addition

2032 Background Weekday AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	18	1239	70	3318	39	15	93
v/c Ratio	0.24	0.35	0.56	0.83	0.41	0.23	0.58
Control Delay	73.2	2.5	87.2	13.2	42.7	79.9	30.0
Queue Delay	0.0	0.0	0.0	46.3	0.0	0.0	0.0
Total Delay	73.2	2.6	87.2	59.5	42.7	79.9	30.1
Queue Length 50th (m)	6.2	10.3	21.9	221.8	2.8	4.7	1.6
Queue Length 95th (m)	m12.5	12.1	38.1	303.1	15.2	12.6	19.6
Internal Link Dist (m)		155.0		158.8	65.7		136.4
Turn Bay Length (m)	40.0		45.0			25.0	
Base Capacity (vph)	130	3583	145	3990	318	294	405
Starvation Cap Reductn	0	381	0	0	0	0	0
Spillback Cap Reductn	0	0	0	1032	0	0	18
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.39	0.48	1.12	0.12	0.05	0.24

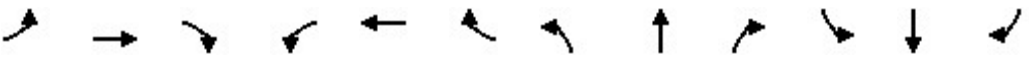
Intersection Summary

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

5: Stonehenge Crescent & Innes

2032 Background Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	1229	10	70	3309	9	7	2	30	15	5	88
Future Volume (veh/h)	18	1229	10	70	3309	9	7	2	30	15	5	88
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	0.99		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	1716	1744	1337	1772	1786	1800	1800	1800	1800	1800	1800	1786
Adj Flow Rate, veh/h	18	1229	10	70	3309	9	7	2	30	15	5	88
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, %	6	4	33	2	1	0	0	0	0	0	0	1
Cap, veh/h	28	3495	28	87	3775	10	40	21	113	160	9	155
Arrive On Green	0.02	0.72	0.72	0.05	0.75	0.75	0.11	0.11	0.11	0.11	0.11	0.11
Sat Flow, veh/h	1634	4871	40	1688	5020	14	122	191	1044	1385	82	1436
Grp Volume(v), veh/h	18	801	438	70	2141	1177	39	0	0	15	0	93
Grp Sat Flow(s),veh/h/ln	1634	1587	1736	1688	1625	1783	1357	0	0	1385	0	1518
Q Serve(g_s), s	1.8	15.3	15.3	6.6	76.6	77.0	0.0	0.0	0.0	0.0	0.0	9.3
Cycle Q Clear(g_c), s	1.8	15.3	15.3	6.6	76.6	77.0	9.4	0.0	0.0	2.7	0.0	9.3
Prop In Lane	1.00		0.02	1.00		0.01	0.18		0.77	1.00		0.95
Lane Grp Cap(c), veh/h	28	2277	1246	87	2444	1341	173	0	0	160	0	164
V/C Ratio(X)	0.64	0.35	0.35	0.80	0.88	0.88	0.23	0.00	0.00	0.09	0.00	0.57
Avail Cap(c_a), veh/h	131	2277	1246	135	2444	1341	341	0	0	318	0	337
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)	0.87	0.87	0.87	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	78.1	8.5	8.5	75.1	14.4	14.5	65.3	0.0	0.0	64.9	0.0	67.8
Incr Delay (d2), s/veh	19.1	0.4	0.7	17.4	4.8	8.3	0.7	0.0	0.0	0.3	0.0	3.1
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(95%),veh/ln	1.6	9.7	10.6	6.1	40.5	45.7	2.8	0.0	0.0	1.1	0.0	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	97.3	8.9	9.2	92.4	19.2	22.8	66.0	0.0	0.0	65.2	0.0	70.9
LnGrp LOS	F	A	A	F	B	C	E	A	A	E	A	E
Approach Vol, veh/h	1257			3388			39			108		
Approach Delay, s/veh	10.3			22.0			66.0			70.1		
Approach LOS	B			C			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.5	120.8		24.7	9.0	126.3		24.7				
Change Period (Y+Rc), s	* 6.2	6.0		7.5	* 6.2	6.0		7.5				
Max Green Setting (Gmax), s	* 13	92.0		35.5	* 13	92.0		35.5				
Max Q Clear Time (g_c+I1), s	8.6	17.3		11.4	3.8	79.0		11.3				
Green Ext Time (p_c), s	0.1	39.4		0.4	0.0	13.0		1.4				

Intersection Summary

HCM 6th Ctrl Delay	20.4
HCM 6th LOS	C

Notes

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

Intersection												
Int Delay, s/veh	3.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations						↰		↱↲			↰	
Traffic Vol, veh/h	0	0	0	0	0	136	0	149	16	49	97	75
Future Vol, veh/h	0	0	0	0	0	136	0	149	16	49	97	75
Conflicting Peds, #/hr	0	0	4	4	0	0	0	0	2	2	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-
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	0	0	0	4	0	7	6	2	7	4
Mvmt Flow	0	0	0	0	0	136	0	149	16	49	97	75
Major/Minor	Minor1			Major1			Major2					
Conflicting Flow All	-			-	-	85	-	0	0	167	0	0
Stage 1	-			-	-	-	-	-	-	-	-	-
Stage 2	-			-	-	-	-	-	-	-	-	-
Critical Hdwy	-			-	-	6.96	-	-	-	4.13	-	-
Critical Hdwy Stg 1	-			-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-			-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-			-	-	3.338	-	-	-	2.219	-	-
Pot Cap-1 Maneuver	0			0	0	952	0	-	-	1410	-	0
Stage 1	0			0	0	-	0	-	-	-	-	0
Stage 2	0			0	0	-	0	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver	-			0	0	950	-	-	-	1407	-	-
Mov Cap-2 Maneuver	-			0	0	-	-	-	-	-	-	-
Stage 1	-			0	0	-	-	-	-	-	-	-
Stage 2	-			0	0	-	-	-	-	-	-	-
Approach	WB			NB			SB					
HCM Control Delay, s	9.4			0			2.6					
HCM LOS	A											
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT							
Capacity (veh/h)	-	-	950	1407	-							
HCM Lane V/C Ratio	-	-	0.143	0.035	-							
HCM Control Delay (s)	-	-	9.4	7.7	-							
HCM Lane LOS	-	-	A	A	-							
HCM 95th %tile Q(veh)	-	-	0.5	0.1	-							

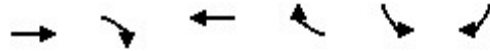
Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	163	89	0
Future Vol, veh/h	0	0	0	163	89	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	0	0	163	89	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	252	89	89	0	-	0
Stage 1	89	-	-	-	-	-
Stage 2	163	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	741	975	1519	-	-	-
Stage 1	940	-	-	-	-	-
Stage 2	871	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	741	975	1519	-	-	-
Mov Cap-2 Maneuver	741	-	-	-	-	-
Stage 1	940	-	-	-	-	-
Stage 2	871	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1519	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	0	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	-	-	-	

Intersection						
Int Delay, s/veh	4.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	113	0	3	49	22	66
Future Vol, veh/h	113	0	3	49	22	66
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, %	4	0	0	12	27	0
Mvmt Flow	113	0	3	49	22	66
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	110	55	88	0	-	0
Stage 1	55	-	-	-	-	-
Stage 2	55	-	-	-	-	-
Critical Hdwy	6.44	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	882	1018	1520	-	-	-
Stage 1	962	-	-	-	-	-
Stage 2	962	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	880	1018	1520	-	-	-
Mov Cap-2 Maneuver	880	-	-	-	-	-
Stage 1	960	-	-	-	-	-
Stage 2	962	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.7	0.4		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1520	-	880	-	-	
HCM Lane V/C Ratio	0.002	-	0.128	-	-	
HCM Control Delay (s)	7.4	0	9.7	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0.4	-	-	

Queues
1: Highway 417 SB Ramp & Innes

Gloucester Costco Business Centre Gas Bar Addition

2032 Background Weekday PM Peak Hour



Lane Group	EBT	EBR	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	1477	400	880	556	1020	308
v/c Ratio	0.73	0.41	0.45	0.50	0.93	0.23
Control Delay	23.9	8.1	8.3	2.1	61.3	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.9	8.1	8.3	2.1	61.3	0.4
Queue Length 50th (m)	153.0	24.2	31.8	4.9	138.9	0.0
Queue Length 95th (m)	180.7	45.5	42.5	6.5	#176.2	0.0
Internal Link Dist (m)	248.5		391.3			
Turn Bay Length (m)		45.0		100.0	75.0	75.0
Base Capacity (vph)	2014	972	1937	1112	1123	1311
Starvation Cap Reductn	0	0	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	0.73	0.41	0.45	0.50	0.91	0.23

Intersection Summary

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

1: Highway 417 SB Ramp & Innes

2032 Background Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗				↘↘		↗
Traffic Volume (veh/h)	0	1477	400	0	880	556	0	0	0	1020	0	308
Future Volume (veh/h)	0	1477	400	0	880	556	0	0	0	1020	0	308
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	0	1786	1758	0	1730	1758				1800	0	1547
Adj Flow Rate, veh/h	0	1477	0	0	880	0				1020	0	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Percent Heavy Veh, %	0	1	3	0	5	3				0	0	18
Cap, veh/h	0	1994		0	1931					1084	0	
Arrive On Green	0.00	0.59	0.00	0.00	0.59	0.00				0.33	0.00	0.00
Sat Flow, veh/h	0	3483	1490	0	3373	1490				3326	0	1311
Grp Volume(v), veh/h	0	1477	0	0	880	0				1020	0	0
Grp Sat Flow(s),veh/h/ln	0	1697	1490	0	1643	1490				1663	0	1311
Q Serve(g_s), s	0.0	44.5	0.0	0.0	21.1	0.0				41.7	0.0	0.0
Cycle Q Clear(g_c), s	0.0	44.5	0.0	0.0	21.1	0.0				41.7	0.0	0.0
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1994		0	1931					1084	0	
V/C Ratio(X)	0.00	0.74		0.00	0.46					0.94	0.00	
Avail Cap(c_a), veh/h	0	1994		0	1931					1114	0	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	21.1	0.0	0.0	16.3	0.0				45.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	2.5	0.0	0.0	0.8	0.0				14.7	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
%ile BackOfQ(95%),veh/ln	0.0	26.9	0.0	0.0	13.8	0.0				27.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	23.6	0.0	0.0	17.0	0.0				60.6	0.0	0.0
LnGrp LOS	A	C		A	B					E	A	
Approach Vol, veh/h		1477			880					1020		
Approach Delay, s/veh		23.6			17.0					60.6		
Approach LOS		C			B					E		
Timer - Assigned Phs		2			6			8				
Phs Duration (G+Y+Rc), s		88.3			88.3			51.7				
Change Period (Y+Rc), s		* 6			* 6			6.1				
Max Green Setting (Gmax), s		* 81			* 81			46.9				
Max Q Clear Time (g_c+I1), s		46.5			23.1			43.7				
Green Ext Time (p_c), s		28.9			23.4			1.9				
Intersection Summary												
HCM 6th Ctrl Delay			33.1									
HCM 6th LOS			C									

Notes

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

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

Queues
2: Highway 417 NB Ramp & Innes

Gloucester Costco Business Centre Gas Bar Addition

2032 Background Weekday PM Peak Hour

	→	↘	←	↖	↙	↗
Lane Group	EBT	EBR	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	2115	383	1253	755	183	733
v/c Ratio	0.75	0.30	0.45	0.54	0.63	0.48
Control Delay	7.1	0.8	0.7	5.3	69.8	1.1
Queue Delay	0.6	0.0	0.1	0.3	0.0	0.1
Total Delay	7.7	0.8	0.8	5.6	69.8	1.2
Queue Length 50th (m)	141.7	2.9	3.5	31.8	25.4	0.0
Queue Length 95th (m)	154.4	m6.3	4.9	199.1	36.8	0.0
Internal Link Dist (m)	391.3		192.3			
Turn Bay Length (m)				180.0	100.0	75.0
Base Capacity (vph)	2810	1267	2755	1386	587	1513
Starvation Cap Reductn	0	0	418	201	0	0
Spillback Cap Reductn	324	0	0	0	0	141
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.30	0.54	0.64	0.31	0.53
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

2: Highway 417 NB Ramp & Innes

2032 Background Weekday PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗	↖↗		↗			
Traffic Volume (veh/h)	0	2115	383	0	1253	755	183	0	733	0	0	0
Future Volume (veh/h)	0	2115	383	0	1253	755	183	0	733	0	0	0
Initial Q (Qb), veh	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			
Parking Bus, Adj	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				
Adj Sat Flow, veh/h/ln	0	1800	1772	0	1772	1786	1533	0	1786			
Adj Flow Rate, veh/h	0	2115	0	0	1253	0	183	0	0			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	0	0	2	0	2	1	19	0	1			
Cap, veh/h	0	2843		0	2799		239	0				
Arrive On Green	0.00	0.83	0.00	0.00	1.00	0.00	0.08	0.00	0.00			
Sat Flow, veh/h	0	3510	1502	0	3455	1514	2833	0	1514			
Grp Volume(v), veh/h	0	2115	0	0	1253	0	183	0	0			
Grp Sat Flow(s),veh/h/ln	0	1710	1502	0	1683	1514	1416	0	1514			
Q Serve(g_s), s	0.0	38.3	0.0	0.0	0.0	0.0	8.9	0.0	0.0			
Cycle Q Clear(g_c), s	0.0	38.3	0.0	0.0	0.0	0.0	8.9	0.0	0.0			
Prop In Lane	0.00		1.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2843		0	2799		239	0				
V/C Ratio(X)	0.00	0.74		0.00	0.45		0.76	0.00				
Avail Cap(c_a), veh/h	0	2843		0	2799		591	0				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	0.00	0.00	0.65	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	0.0	5.2	0.0	0.0	0.0	0.0	62.7	0.0	0.0			
Incr Delay (d2), s/veh	0.0	1.8	0.0	0.0	0.3	0.0	5.0	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			
%ile BackOfQ(95%),veh/ln	0.0	20.9	0.0	0.0	0.2	0.0	6.3	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	7.0	0.0	0.0	0.3	0.0	67.8	0.0	0.0			
LnGrp LOS	A	A		A	A		E	A				
Approach Vol, veh/h		2115			1253			183				
Approach Delay, s/veh		7.0			0.3			67.8				
Approach LOS		A			A			E				
Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		122.4		17.6		122.4						
Change Period (Y+Rc), s		* 6		* 5.8		* 6						
Max Green Setting (Gmax), s		* 99		* 29		* 99						
Max Q Clear Time (g_c+I1), s		40.3		10.9		2.0						
Green Ext Time (p_c), s		55.9		1.0		49.3						
Intersection Summary												
HCM 6th Ctrl Delay			7.8									
HCM 6th LOS			A									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.												

Queues
3: Innes Crossing & Innes

Gloucester Costco Business Centre Gas Bar Addition

2032 Background Weekday PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	139	2610	20	1767	77	92	98	14	192
v/c Ratio	0.91	0.95	0.24	0.74	0.10	0.22	0.27	0.03	0.35
Control Delay	117.3	28.1	80.3	8.4	0.8	33.2	42.0	37.1	9.2
Queue Delay	0.0	1.4	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Total Delay	117.3	29.5	80.3	8.6	0.8	33.2	42.0	37.1	9.2
Queue Length 50th (m)	40.6	~245.8	5.4	36.6	0.3	15.9	21.3	2.8	3.9
Queue Length 95th (m)	m#67.5	#309.3	m8.1	42.5	m0.8	30.8	37.4	8.4	22.9
Internal Link Dist (m)		192.3		193.0		122.5		129.2	
Turn Bay Length (m)	50.0		45.0		90.0		45.0		45.0
Base Capacity (vph)	153	2761	139	2386	783	414	359	507	549
Starvation Cap Reductn	0	58	0	136	0	0	0	0	0
Spillback Cap Reductn	0	0	0	73	0	0	0	0	3
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.97	0.14	0.79	0.10	0.22	0.27	0.03	0.35

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

3: Innes Crossing & Innes

2032 Background Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 			 	
Traffic Volume (veh/h)	139	2603	7	20	1767	77	43	19	30	98	14	192
Future Volume (veh/h)	139	2603	7	20	1767	77	43	19	30	98	14	192
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		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	1800	1786	1603	1660	1772	1800	1730	1800	1758	1800	1800	1800
Adj Flow Rate, veh/h	139	2603	7	20	1767	77	43	19	30	98	14	192
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	14	10	2	0	5	0	3	0	0	0
Cap, veh/h	152	2808	8	31	2370	742	208	94	128	427	501	424
Arrive On Green	0.09	0.56	0.56	0.02	0.49	0.49	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1714	5020	13	1581	4837	1515	610	336	458	1374	1800	1520
Grp Volume(v), veh/h	139	1685	925	20	1767	77	92	0	0	98	14	192
Grp Sat Flow(s),veh/h/ln	1714	1625	1783	1581	1612	1515	1404	0	0	1374	1800	1520
Q Serve(g_s), s	11.3	66.4	66.5	1.8	41.1	3.8	4.4	0.0	0.0	1.9	0.8	14.6
Cycle Q Clear(g_c), s	11.3	66.4	66.5	1.8	41.1	3.8	6.6	0.0	0.0	8.5	0.8	14.6
Prop In Lane	1.00		0.01	1.00		1.00	0.47		0.33	1.00		1.00
Lane Grp Cap(c), veh/h	152	1818	997	31	2370	742	429	0	0	427	501	424
V/C Ratio(X)	0.92	0.93	0.93	0.66	0.75	0.10	0.21	0.00	0.00	0.23	0.03	0.45
Avail Cap(c_a), veh/h	152	1818	997	140	2370	742	429	0	0	427	501	424
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)	0.67	0.67	0.67	0.64	0.64	0.64	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	63.3	28.2	28.3	68.2	28.7	19.2	38.7	0.0	0.0	39.6	36.7	41.7
Incr Delay (d2), s/veh	37.5	6.9	11.5	14.2	1.4	0.2	1.1	0.0	0.0	1.3	0.1	3.5
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(95%),veh/ln	10.2	36.3	40.9	1.5	22.7	2.7	5.0	0.0	0.0	5.4	0.7	10.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	100.8	35.2	39.7	82.4	30.1	19.4	39.8	0.0	0.0	40.8	36.8	45.2
LnGrp LOS	F	D	D	F	C	B	D	A	A	D	D	D
Approach Vol, veh/h		2749			1864			92			304	
Approach Delay, s/veh		40.0			30.2			39.8			43.4	
Approach LOS		D			C			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.3	84.7		46.0	19.0	75.0		46.0				
Change Period (Y+Rc), s	* 6.6	6.4		7.0	* 6.6	6.4		7.0				
Max Green Setting (Gmax), s	* 12	68.6		39.0	* 12	68.6		39.0				
Max Q Clear Time (g_c+I1), s	3.8	68.5		8.6	13.3	43.1		16.6				
Green Ext Time (p_c), s	0.0	0.1		1.4	0.0	23.6		1.9				

Intersection Summary

HCM 6th Ctrl Delay	36.6
HCM 6th LOS	D

Notes

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

Queues
4: Cryville & Innes

Gloucester Costco Business Centre Gas Bar Addition

2032 Background Weekday PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	88	2361	249	94	1413	241	212	57	118	597	116	210
v/c Ratio	0.72	1.29	0.39	0.74	0.78	0.37	0.51	0.13	0.25	1.45	0.26	0.42
Control Delay	95.1	162.9	14.3	111.1	33.0	5.6	62.1	42.4	7.4	257.3	44.7	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	95.1	162.9	14.3	111.1	33.2	5.6	62.1	42.4	7.4	257.3	44.7	12.4
Queue Length 50th (m)	25.9	~301.4	19.4	23.4	127.0	13.4	28.7	12.4	0.0	~115.6	26.2	7.6
Queue Length 95th (m)	m28.4	#327.5	m22.4	#53.9	146.0	10.3	41.8	24.2	13.9	#152.3	43.4	29.6
Internal Link Dist (m)		193.0			155.0			42.3			210.4	
Turn Bay Length (m)	70.0		85.0	45.0		60.0	55.0		45.0	90.0		100.0
Base Capacity (vph)	129	1837	635	133	1821	656	416	443	463	412	443	496
Starvation Cap Reductn	0	0	0	0	54	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	1.29	0.39	0.71	0.80	0.37	0.51	0.13	0.25	1.45	0.26	0.42

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

4: Cryville & Innes

2032 Background Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 			 		
Traffic Volume (veh/h)	88	2361	249	94	1413	241	212	57	118	597	116	210
Future Volume (veh/h)	88	2361	249	94	1413	241	212	57	118	597	116	210
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		0.99	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	1758	1786	1786	1800	1772	1772	1800	1800	1800	1786	1800	1772
Adj Flow Rate, veh/h	88	2361	0	94	1413	0	212	57	118	597	116	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, %	3	1	1	0	2	2	0	0	0	1	0	2
Cap, veh/h	107	1852		115	1853		413	438	368	410	438	
Arrive On Green	0.09	0.51	0.00	0.02	0.13	0.00	0.12	0.24	0.24	0.12	0.24	0.00
Sat Flow, veh/h	1674	4876	1514	1714	4837	1502	3326	1800	1512	3300	1800	1502
Grp Volume(v), veh/h	88	2361	0	94	1413	0	212	57	118	597	116	0
Grp Sat Flow(s),veh/h/ln	1674	1625	1514	1714	1612	1502	1663	1800	1512	1650	1800	1502
Q Serve(g_s), s	7.2	53.2	0.0	7.6	39.5	0.0	8.3	3.5	7.1	17.4	7.3	0.0
Cycle Q Clear(g_c), s	7.2	53.2	0.0	7.6	39.5	0.0	8.3	3.5	7.1	17.4	7.3	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	107	1852		115	1853		413	438	368	410	438	
V/C Ratio(X)	0.82	1.28		0.81	0.76		0.51	0.13	0.32	1.46	0.26	
Avail Cap(c_a), veh/h	129	1852		132	1853		413	438	368	410	438	
HCM Platoon Ratio	1.33	1.33	1.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.27	0.27	0.00	0.86	0.86	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	63.2	34.6	0.0	67.6	55.0	0.0	57.3	41.4	27.2	61.3	42.8	0.0
Incr Delay (d2), s/veh	9.3	125.0	0.0	24.8	2.6	0.0	1.1	0.6	2.3	218.2	1.5	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(95%),veh/ln	5.0	57.4	0.0	7.6	24.3	0.0	6.8	3.1	5.5	31.6	6.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.5	159.6	0.0	92.3	57.6	0.0	58.4	42.0	29.5	279.5	44.3	0.0
LnGrp LOS	E	F		F	E		E	D	C	F	D	
Approach Vol, veh/h		2449			1507			387			713	
Approach Delay, s/veh		156.5			59.8			47.2			241.3	
Approach LOS		F			E			D			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.6	59.4	24.0	41.0	15.2	59.8	24.0	41.0				
Change Period (Y+Rc), s	* 6.2	* 6.2	* 6.6	6.9	* 6.2	* 6.2	* 6.6	6.9				
Max Green Setting (Gmax), s	* 11	* 52	* 17	34.1	* 11	* 52	* 17	34.1				
Max Q Clear Time (g_c+I1), s	9.6	55.2	19.4	9.1	9.2	41.5	10.3	9.3				
Green Ext Time (p_c), s	0.0	0.0	0.0	1.4	0.0	9.3	0.6	1.6				

Intersection Summary

HCM 6th Ctrl Delay	131.2
HCM 6th LOS	F

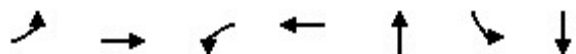
Notes

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

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

Queues
5: Stonehenge Crescent & Innes

Gloucester Costco Business Centre Gas Bar Addition
2032 Background Weekday PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	72	2985	65	1700	105	22	69
v/c Ratio	0.51	0.83	0.49	0.49	0.64	0.34	0.43
Control Delay	72.6	10.0	73.8	10.4	41.0	74.9	24.1
Queue Delay	0.0	1.8	0.0	0.0	0.0	0.0	0.0
Total Delay	72.6	11.8	73.8	10.4	41.0	74.9	24.1
Queue Length 50th (m)	21.3	76.8	17.6	68.4	9.2	6.0	1.6
Queue Length 95th (m)	m15.1	m51.7	32.2	101.8	27.4	14.6	15.9
Internal Link Dist (m)		155.0		158.8	65.7		136.4
Turn Bay Length (m)	40.0		45.0			25.0	
Base Capacity (vph)	145	3606	137	3447	422	239	431
Starvation Cap Reductn	0	437	0	0	0	0	0
Spillback Cap Reductn	0	0	0	28	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.94	0.47	0.50	0.25	0.09	0.16

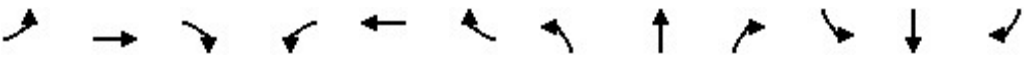
Intersection Summary

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

5: Stonehenge Crescent & Innes

2032 Background Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰↰↰		↰	↰↰↰			↰↰		↰	↰	
Traffic Volume (veh/h)	72	2977	8	65	1676	24	23	11	71	22	6	63
Future Volume (veh/h)	72	2977	8	65	1676	24	23	11	71	22	6	63
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		0.98	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	1800	1786	1800	1800	1772	1800	1730	1800	1800	1800	1800	1772
Adj Flow Rate, veh/h	72	2977	8	65	1676	24	23	11	71	22	6	63
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	0	0	2	0	5	0	0	0	0	2
Cap, veh/h	90	3412	9	82	3316	47	60	36	135	196	17	183
Arrive On Green	0.05	0.68	0.68	0.05	0.67	0.67	0.13	0.13	0.13	0.13	0.13	0.13
Sat Flow, veh/h	1714	5020	13	1714	4913	70	214	277	1026	1321	132	1388
Grp Volume(v), veh/h	72	1926	1059	65	1100	600	105	0	0	22	0	69
Grp Sat Flow(s),veh/h/ln	1714	1625	1783	1714	1612	1758	1518	0	0	1321	0	1520
Q Serve(g_s), s	5.8	65.2	65.5	5.3	23.6	23.6	2.5	0.0	0.0	0.0	0.0	5.8
Cycle Q Clear(g_c), s	5.8	65.2	65.5	5.3	23.6	23.6	8.8	0.0	0.0	3.2	0.0	5.8
Prop In Lane	1.00		0.01	1.00		0.04	0.22		0.68	1.00		0.91
Lane Grp Cap(c), veh/h	90	2209	1212	82	2177	1187	231	0	0	196	0	200
V/C Ratio(X)	0.80	0.87	0.87	0.79	0.51	0.51	0.45	0.00	0.00	0.11	0.00	0.34
Avail Cap(c_a), veh/h	108	2209	1212	108	2177	1187	412	0	0	357	0	385
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)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	65.6	17.6	17.7	66.0	11.2	11.2	56.5	0.0	0.0	54.2	0.0	55.3
Incr Delay (d2), s/veh	3.3	0.5	0.9	25.0	0.8	1.5	1.4	0.0	0.0	0.2	0.0	1.0
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(95%),veh/ln	3.5	28.5	31.3	5.3	14.6	16.0	6.8	0.0	0.0	1.4	0.0	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.9	18.1	18.6	91.0	12.1	12.8	57.9	0.0	0.0	54.4	0.0	56.3
LnGrp LOS	E	B	B	F	B	B	E	A	A	D	A	E
Approach Vol, veh/h	3057			1765			105			91		
Approach Delay, s/veh	19.5			15.2			57.9			55.8		
Approach LOS	B			B			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.9	101.2		25.9	13.6	100.5		25.9				
Change Period (Y+Rc), s	* 6.2	6.0		7.5	* 6.2	6.0		7.5				
Max Green Setting (Gmax), s	* 8.8	76.0		35.5	* 8.8	76.0		35.5				
Max Q Clear Time (g_c+I1), s	7.3	67.5		10.8	7.8	25.6		7.8				
Green Ext Time (p_c), s	0.0	8.5		1.5	0.0	42.1		1.1				

Intersection Summary

HCM 6th Ctrl Delay	19.4
HCM 6th LOS	B

Notes

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

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	0	71	0	316	11	49	206	204
Future Vol, veh/h	0	0	0	0	0	71	0	316	11	49	206	204
Conflicting Peds, #/hr	1	0	2	2	0	1	2	0	3	3	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-
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	0	0	0	0	0	0	0	2	0	0
Mvmt Flow	0	0	0	0	0	71	0	316	11	49	206	204

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	-	168	-	0	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	6.9	-	-	4.13
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.3	-	-	2.219
Pot Cap-1 Maneuver	0	0	853	0	-	1228
Stage 1	0	0	-	0	-	-
Stage 2	0	0	-	0	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	0	850	-	-	1225
Mov Cap-2 Maneuver	-	0	-	-	-	-
Stage 1	-	0	-	-	-	-
Stage 2	-	0	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.6	0	1.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	850	1225
HCM Lane V/C Ratio	-	-	0.084	0.04
HCM Control Delay (s)	-	-	9.6	8.1
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	326	143	0
Future Vol, veh/h	0	0	0	326	143	0
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	0	0	0	0
Mvmt Flow	0	0	0	326	143	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	469	143	143	0	-	0
Stage 1	143	-	-	-	-	-
Stage 2	326	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	556	910	1452	-	-	-
Stage 1	889	-	-	-	-	-
Stage 2	736	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	556	910	1452	-	-	-
Mov Cap-2 Maneuver	556	-	-	-	-	-
Stage 1	889	-	-	-	-	-
Stage 2	736	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1452	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	0	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	-	-	-	

Intersection						
Int Delay, s/veh	7.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	281	5	2	25	18	98
Future Vol, veh/h	281	5	2	25	18	98
Conflicting Peds, #/hr	0	1	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	0	0	0	0
Mvmt Flow	281	5	2	25	18	98
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	96	68	116	0	-	0
Stage 1	67	-	-	-	-	-
Stage 2	29	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	908	1001	1485	-	-	-
Stage 1	961	-	-	-	-	-
Stage 2	999	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	907	1000	1485	-	-	-
Mov Cap-2 Maneuver	907	-	-	-	-	-
Stage 1	960	-	-	-	-	-
Stage 2	999	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.8	0.6		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1485	-	908	-	-	
HCM Lane V/C Ratio	0.001	-	0.315	-	-	
HCM Control Delay (s)	7.4	0	10.8	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	1.4	-	-	

Queues
1: Highway 417 SB Ramp & Innes

Gloucester Costco Business Centre Gas Bar Addition
2032 Background Saturday Midday Peak Hour



Lane Group	EBT	EBR	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	1018	147	1029	551	819	268
v/c Ratio	0.49	0.15	0.49	0.48	0.89	0.18
Control Delay	12.3	1.9	12.4	2.4	47.5	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.3	1.9	12.4	2.4	47.5	0.3
Queue Length 50th (m)	56.1	0.0	57.0	0.0	76.8	0.0
Queue Length 95th (m)	71.5	7.3	72.4	12.7	#105.8	0.0
Internal Link Dist (m)	248.5		391.3			
Turn Bay Length (m)		45.0		100.0	75.0	75.0
Base Capacity (vph)	2088	983	2088	1143	969	1502
Starvation Cap Reductn	0	0	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	0.49	0.15	0.49	0.48	0.85	0.18

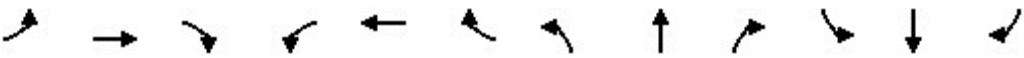
Intersection Summary

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

1: Highway 417 SB Ramp & Innes

2032 Background Saturday Midday Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗				↘↘		↗
Traffic Volume (veh/h)	0	1018	147	0	1029	551	0	0	0	819	0	268
Future Volume (veh/h)	0	1018	147	0	1029	551	0	0	0	819	0	268
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	0	1800	1786	0	1800	1786				1800	0	1758
Adj Flow Rate, veh/h	0	1018	0	0	1029	0				819	0	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Percent Heavy Veh, %	0	0	1	0	0	1				0	0	3
Cap, veh/h	0	2072		0	2072					909	0	
Arrive On Green	0.00	0.61	0.00	0.00	0.61	0.00				0.27	0.00	0.00
Sat Flow, veh/h	0	3510	1514	0	3510	1514				3326	0	1490
Grp Volume(v), veh/h	0	1018	0	0	1029	0				819	0	0
Grp Sat Flow(s),veh/h/ln	0	1710	1514	0	1710	1514				1663	0	1490
Q Serve(g_s), s	0.0	16.7	0.0	0.0	17.0	0.0				23.7	0.0	0.0
Cycle Q Clear(g_c), s	0.0	16.7	0.0	0.0	17.0	0.0				23.7	0.0	0.0
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2072		0	2072					909	0	
V/C Ratio(X)	0.00	0.49		0.00	0.50					0.90	0.00	
Avail Cap(c_a), veh/h	0	2072		0	2072					961	0	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	11.1	0.0	0.0	11.1	0.0				35.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.8	0.0	0.0	0.9	0.0				11.1	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
%ile BackOfQ(95%),veh/ln	0.0	11.4	0.0	0.0	11.6	0.0				17.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	11.9	0.0	0.0	12.0	0.0				46.2	0.0	0.0
LnGrp LOS	A	B		A	B					D	A	
Approach Vol, veh/h		1018			1029						819	
Approach Delay, s/veh		11.9			12.0						46.2	
Approach LOS		B			B						D	
Timer - Assigned Phs		2			6			8				
Phs Duration (G+Y+Rc), s		66.6			66.6			33.4				
Change Period (Y+Rc), s		* 6			* 6			6.1				
Max Green Setting (Gmax), s		* 59			* 59			28.9				
Max Q Clear Time (g_c+I1), s		18.7			19.0			25.7				
Green Ext Time (p_c), s		23.2			23.4			1.6				
Intersection Summary												
HCM 6th Ctrl Delay			21.7									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Queues
2: Highway 417 NB Ramp & Innes

Gloucester Costco Business Centre Gas Bar Addition
2032 Background Saturday Midday Peak Hour

	→	↘	←	↖	↙	↗
Lane Group	EBT	EBR	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	1591	246	1409	1023	171	525
v/c Ratio	0.58	0.19	0.51	0.71	0.52	0.34
Control Delay	5.7	0.8	2.0	15.7	52.2	0.6
Queue Delay	0.0	0.0	0.1	1.3	0.0	0.0
Total Delay	5.7	0.8	2.2	17.0	52.2	0.6
Queue Length 50th (m)	55.5	0.0	4.6	97.0	18.2	0.0
Queue Length 95th (m)	80.6	5.0	m6.8	m69.7	28.1	0.0
Internal Link Dist (m)	391.3		192.3			
Turn Bay Length (m)				180.0	100.0	75.0
Base Capacity (vph)	2739	1276	2739	1438	723	1547
Starvation Cap Reductn	0	0	374	220	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.19	0.60	0.84	0.24	0.34

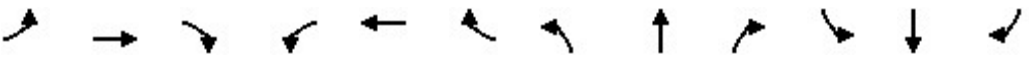
Intersection Summary

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

2: Highway 417 NB Ramp & Innes

2032 Background Saturday Midday Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗	↖↗		↗			
Traffic Volume (veh/h)	0	1591	246	0	1409	1023	171	0	525	0	0	0
Future Volume (veh/h)	0	1591	246	0	1409	1023	171	0	525	0	0	0
Initial Q (Qb), veh	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			
Parking Bus, Adj	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				
Adj Sat Flow, veh/h/ln	0	1800	1800	0	1800	1800	1772	0	1800			
Adj Flow Rate, veh/h	0	1591	0	0	1409	0	171	0	0			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	0	0	0	0	0	0	2	0	0			
Cap, veh/h	0	2793		0	2793		249	0				
Arrive On Green	0.00	0.82	0.00	0.00	1.00	0.00	0.08	0.00	0.00			
Sat Flow, veh/h	0	3510	1525	0	3510	1525	3274	0	1525			
Grp Volume(v), veh/h	0	1591	0	0	1409	0	171	0	0			
Grp Sat Flow(s),veh/h/ln	0	1710	1525	0	1710	1525	1637	0	1525			
Q Serve(g_s), s	0.0	17.5	0.0	0.0	0.0	0.0	5.6	0.0	0.0			
Cycle Q Clear(g_c), s	0.0	17.5	0.0	0.0	0.0	0.0	5.6	0.0	0.0			
Prop In Lane	0.00		1.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2793		0	2793		249	0				
V/C Ratio(X)	0.00	0.57		0.00	0.50		0.69	0.00				
Avail Cap(c_a), veh/h	0	2793		0	2793		720	0				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	0.00	0.00	0.09	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	0.0	3.5	0.0	0.0	0.0	0.0	49.5	0.0	0.0			
Incr Delay (d2), s/veh	0.0	0.8	0.0	0.0	0.1	0.0	3.3	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			
%ile BackOfQ(95%),veh/ln	0.0	10.5	0.0	0.0	0.0	0.0	4.5	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	4.3	0.0	0.0	0.1	0.0	52.9	0.0	0.0			
LnGrp LOS	A	A		A	A		D	A				
Approach Vol, veh/h		1591			1409			171				
Approach Delay, s/veh		4.3			0.1			52.9				
Approach LOS		A			A			D				
Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		95.8		14.2		95.8						
Change Period (Y+Rc), s		* 6		* 5.8		* 6						
Max Green Setting (Gmax), s		* 74		* 24		* 74						
Max Q Clear Time (g_c+I1), s		19.5		7.6		2.0						
Green Ext Time (p_c), s		44.7		0.8		49.0						
Intersection Summary												
HCM 6th Ctrl Delay			5.0									
HCM 6th LOS			A									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.												

Queues
3: Innes Crossing & Innes

Gloucester Costco Business Centre Gas Bar Addition

2032 Background Saturday Midday Peak Hour



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	240	1834	26	2123	142	77	124	10	271
v/c Ratio	1.34	0.83	0.23	1.19	0.23	0.14	0.27	0.02	0.39
Control Delay	224.4	28.8	59.5	99.7	1.3	16.4	27.4	23.3	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	224.4	28.8	59.5	99.7	1.3	16.4	27.4	23.3	6.3
Queue Length 50th (m)	~66.4	135.2	5.5	~206.9	1.3	6.7	18.8	1.4	3.8
Queue Length 95th (m)	#114.8	#176.5	m5.3	m33.5	m0.9	16.9	33.7	5.1	21.4
Internal Link Dist (m)		192.3		193.0		122.5		129.2	
Turn Bay Length (m)	50.0		45.0		90.0		45.0		45.0
Base Capacity (vph)	179	2199	179	1788	620	558	455	645	698
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	1.34	0.83	0.15	1.19	0.23	0.14	0.27	0.02	0.39

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

3: Innes Crossing & Innes

2032 Background Saturday Midday Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 			 	
Traffic Volume (veh/h)	240	1823	11	26	2123	142	34	13	30	124	10	271
Future Volume (veh/h)	240	1823	11	26	2123	142	34	13	30	124	10	271
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	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	240	1823	11	26	2123	142	34	13	30	124	10	271
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	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	178	2211	13	43	1769	547	243	99	188	566	638	539
Arrive On Green	0.21	0.88	0.88	0.03	0.48	0.48	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	1714	5040	30	1714	4914	1519	553	278	531	1382	1800	1522
Grp Volume(v), veh/h	240	1185	649	26	2123	142	77	0	0	124	10	271
Grp Sat Flow(s),veh/h/ln	1714	1638	1794	1714	1638	1519	1362	0	0	1382	1800	1522
Q Serve(g_s), s	11.4	17.6	17.6	1.6	39.6	6.1	1.1	0.0	0.0	2.4	0.4	15.4
Cycle Q Clear(g_c), s	11.4	17.6	17.6	1.6	39.6	6.1	3.6	0.0	0.0	6.0	0.4	15.4
Prop In Lane	1.00		0.02	1.00		1.00	0.44		0.39	1.00		1.00
Lane Grp Cap(c), veh/h	178	1437	787	43	1769	547	530	0	0	566	638	539
V/C Ratio(X)	1.35	0.82	0.82	0.61	1.20	0.26	0.15	0.00	0.00	0.22	0.02	0.50
Avail Cap(c_a), veh/h	178	1437	787	178	1769	547	530	0	0	566	638	539
HCM Platoon Ratio	2.00	2.00	2.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.84	0.09	0.09	0.09	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.6	4.9	4.9	52.6	28.7	19.9	24.0	0.0	0.0	24.8	23.0	27.9
Incr Delay (d2), s/veh	185.7	4.7	8.2	1.3	90.6	0.1	0.6	0.0	0.0	0.9	0.0	3.3
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(95%),veh/ln	21.7	5.6	7.3	1.2	38.1	3.0	2.9	0.0	0.0	4.7	0.3	10.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	229.3	9.5	13.0	53.9	119.3	20.0	24.6	0.0	0.0	25.6	23.1	31.2
LnGrp LOS	F	A	B	D	F	C	C	A	A	C	C	C
Approach Vol, veh/h		2074			2291			77			405	
Approach Delay, s/veh		36.1			112.4			24.6			29.3	
Approach LOS		D			F			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.3	54.7		46.0	18.0	46.0		46.0				
Change Period (Y+Rc), s	* 6.6	6.4		7.0	* 6.6	6.4		7.0				
Max Green Setting (Gmax), s	* 11	39.6		39.0	* 11	39.6		39.0				
Max Q Clear Time (g_c+I1), s	3.6	19.6		5.6	13.4	41.6		17.4				
Green Ext Time (p_c), s	0.0	18.8		1.2	0.0	0.0		2.5				

Intersection Summary

HCM 6th Ctrl Delay	71.4
HCM 6th LOS	E

Notes

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

Queues
4: Cryville & Innes

Gloucester Costco Business Centre Gas Bar Addition

2032 Background Saturday Midday Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	113	1445	369	175	1704	283	350	88	175	254	69	190
v/c Ratio	0.62	1.21	0.58	0.85	1.34	0.56	1.10	0.16	0.30	0.81	0.12	0.32
Control Delay	70.1	138.1	16.8	89.9	189.3	12.0	127.8	28.5	5.7	69.4	28.1	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.1	138.1	16.8	89.9	189.3	12.0	127.8	28.5	5.7	69.4	28.1	5.6
Queue Length 50th (m)	26.1	~135.0	31.7	32.8	~180.4	12.6	~44.1	13.7	0.0	28.0	10.6	0.0
Queue Length 95th (m)	m32.2	#164.4	m46.8	#75.0	#209.3	24.2	#72.5	25.5	14.8	#47.7	21.0	15.5
Internal Link Dist (m)		193.0			155.0			42.3			210.4	
Turn Bay Length (m)	70.0		85.0	45.0		60.0	55.0		45.0	90.0		100.0
Base Capacity (vph)	213	1192	635	213	1267	507	317	564	585	313	558	599
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	1.21	0.58	0.82	1.34	0.56	1.10	0.16	0.30	0.81	0.12	0.32

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

4: Cryville & Innes

2032 Background Saturday Midday Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 			 		
Traffic Volume (veh/h)	113	1445	369	175	1704	283	350	88	175	254	69	190
Future Volume (veh/h)	113	1445	369	175	1704	283	350	88	175	254	69	190
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		0.99	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	1800	1800	1800	1800	1800	1786	1800	1800	1786	1786	1786	1786
Adj Flow Rate, veh/h	113	1445	0	175	1704	0	350	88	175	254	69	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	0	0	0	0	1	0	0	1	1	1	1
Cap, veh/h	141	1191		202	1366		314	558	465	312	554	
Arrive On Green	0.06	0.16	0.00	0.16	0.37	0.00	0.09	0.31	0.31	0.09	0.31	0.00
Sat Flow, veh/h	1714	4914	1525	1714	4914	1514	3326	1800	1500	3300	1786	1514
Grp Volume(v), veh/h	113	1445	0	175	1704	0	350	88	175	254	69	0
Grp Sat Flow(s),veh/h/ln	1714	1638	1525	1714	1638	1514	1663	1800	1500	1650	1786	1514
Q Serve(g_s), s	7.2	26.7	0.0	11.0	30.6	0.0	10.4	3.9	7.1	8.3	3.1	0.0
Cycle Q Clear(g_c), s	7.2	26.7	0.0	11.0	30.6	0.0	10.4	3.9	7.1	8.3	3.1	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	141	1191		202	1366		314	558	465	312	554	
V/C Ratio(X)	0.80	1.21		0.87	1.25		1.11	0.16	0.38	0.81	0.12	
Avail Cap(c_a), veh/h	212	1191		212	1366		314	558	465	312	554	
HCM Platoon Ratio	0.67	0.67	0.67	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.50	0.50	0.00	0.74	0.74	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	51.1	46.1	0.0	45.6	34.7	0.0	49.8	27.5	14.9	48.9	27.2	0.0
Incr Delay (d2), s/veh	6.5	100.3	0.0	22.7	116.3	0.0	84.7	0.6	2.3	15.2	0.5	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(95%),veh/ln	5.7	31.5	0.0	9.5	39.2	0.0	13.5	3.5	5.4	7.7	2.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.6	146.3	0.0	68.3	150.9	0.0	134.5	28.1	17.2	64.0	27.7	0.0
LnGrp LOS	E	F		E	F		F	C	B	E	C	
Approach Vol, veh/h		1558			1879			613			323	
Approach Delay, s/veh		139.9			143.2			85.8			56.3	
Approach LOS		F			F			F			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.1	32.9	17.0	41.0	15.2	36.8	17.0	41.0				
Change Period (Y+Rc), s	* 6.2	* 6.2	* 6.6	6.9	* 6.2	* 6.2	* 6.6	6.9				
Max Green Setting (Gmax), s	* 14	* 26	* 10	34.1	* 14	* 26	* 10	34.1				
Max Q Clear Time (g_c+I1), s	13.0	28.7	10.3	9.1	9.2	32.6	12.4	5.1				
Green Ext Time (p_c), s	0.1	0.0	0.0	2.3	0.2	0.0	0.0	0.9				

Intersection Summary

HCM 6th Ctrl Delay	127.6
HCM 6th LOS	F

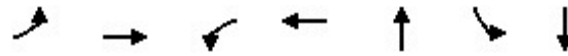
Notes

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

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

Queues
5: Stonehenge Crescent & Innes

Gloucester Costco Business Centre Gas Bar Addition
2032 Background Saturday Midday Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	65	1778	74	2095	97	28	77
v/c Ratio	0.44	0.53	0.47	0.63	0.57	0.26	0.40
Control Delay	54.9	4.0	56.6	12.7	34.8	51.9	17.5
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	54.9	4.1	56.6	12.7	34.8	51.9	17.5
Queue Length 50th (m)	14.9	19.4	15.3	88.6	7.9	5.8	0.6
Queue Length 95th (m)	m14.2	m23.5	29.0	132.4	23.4	14.1	14.0
Internal Link Dist (m)		155.0		158.8	65.7		136.4
Turn Bay Length (m)	40.0		45.0			25.0	
Base Capacity (vph)	160	3327	167	3347	496	418	544
Starvation Cap Reductn	0	416	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.61	0.44	0.63	0.20	0.07	0.14

Intersection Summary

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

5: Stonehenge Crescent & Innes

2032 Background Saturday Midday Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	1767	11	74	2080	15	33	5	59	28	3	74
Future Volume (veh/h)	65	1767	11	74	2080	15	33	5	59	28	3	74
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	0.99		0.99	0.99		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	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	65	1767	11	74	2080	15	33	5	59	28	3	74
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	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	83	3189	20	94	3219	23	87	28	110	221	8	194
Arrive On Green	0.06	0.84	0.84	0.05	0.64	0.64	0.13	0.13	0.13	0.13	0.13	0.13
Sat Flow, veh/h	1714	5039	31	1714	5033	36	323	208	824	1349	59	1459
Grp Volume(v), veh/h	65	1149	629	74	1354	741	97	0	0	28	0	77
Grp Sat Flow(s),veh/h/ln	1714	1638	1794	1714	1638	1793	1355	0	0	1349	0	1518
Q Serve(g_s), s	4.1	11.4	11.4	4.7	27.9	28.0	2.8	0.0	0.0	0.0	0.0	5.1
Cycle Q Clear(g_c), s	4.1	11.4	11.4	4.7	27.9	28.0	7.9	0.0	0.0	2.7	0.0	5.1
Prop In Lane	1.00		0.02	1.00		0.02	0.34		0.61	1.00		0.96
Lane Grp Cap(c), veh/h	83	2074	1136	94	2095	1147	224	0	0	221	0	202
V/C Ratio(X)	0.79	0.55	0.55	0.79	0.65	0.65	0.43	0.00	0.00	0.13	0.00	0.38
Avail Cap(c_a), veh/h	137	2074	1136	137	2095	1147	500	0	0	477	0	490
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)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	50.9	4.1	4.1	51.4	12.2	12.2	44.5	0.0	0.0	42.5	0.0	43.5
Incr Delay (d2), s/veh	1.5	0.1	0.2	16.8	1.6	2.8	1.3	0.0	0.0	0.3	0.0	1.2
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(95%),veh/ln	2.5	3.8	4.2	4.6	16.9	18.7	4.9	0.0	0.0	1.4	0.0	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.4	4.2	4.3	68.1	13.7	15.0	45.9	0.0	0.0	42.8	0.0	44.7
LnGrp LOS	D	A	A	E	B	B	D	A	A	D	A	D
Approach Vol, veh/h	1843				2169				97			
Approach Delay, s/veh	5.9				16.0				45.9			
Approach LOS	A				B				D			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.2	75.6		22.1	11.5	76.3		22.1				
Change Period (Y+Rc), s	* 6.2	6.0		7.5	* 6.2	6.0		7.5				
Max Green Setting (Gmax), s	* 8.8	46.0		35.5	* 8.8	46.0		35.5				
Max Q Clear Time (g_c+I1), s	6.7	13.4		9.9	6.1	30.0		7.1				
Green Ext Time (p_c), s	0.0	29.3		1.3	0.0	15.6		1.3				

Intersection Summary

HCM 6th Ctrl Delay	13.0
HCM 6th LOS	B

Notes

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

Intersection													
Int Delay, s/veh	1.4												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Vol, veh/h	0	0	0	1	0	102	0	511	20	16	273	324	
Future Vol, veh/h	0	0	0	1	0	102	0	511	20	16	273	324	
Conflicting Peds, #/hr	0	0	2	2	0	0	0	0	1	1	0	0	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free	
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-	
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	0	0	0	0	0	0	0	0	0	0	
Mvmt Flow	0	0	0	1	0	102	0	511	20	16	273	324	
Major/Minor				Minor1		Major1		Major2					
Conflicting Flow All				829		-		267		-		0	
Stage 1				522		-		-		-		-	
Stage 2				307		-		-		-		-	
Critical Hdwy				6.6		-		6.9		-		-	
Critical Hdwy Stg 1				5.8		-		-		-		-	
Critical Hdwy Stg 2				5.4		-		-		-		-	
Follow-up Hdwy				3.5		-		3.3		-		-	
Pot Cap-1 Maneuver				328		0		737		0		-	
Stage 1				566		0		-		0		-	
Stage 2				751		0		-		0		-	
Platoon blocked, %										-		-	
Mov Cap-1 Maneuver				321		0		736		-		-	
Mov Cap-2 Maneuver				321		0		-		-		-	
Stage 1				565		0		-		-		-	
Stage 2				736		0		-		-		-	
Approach				WB		NB		SB					
HCM Control Delay, s				10.7		0		0.5					
HCM LOS				B									
Minor Lane/Major Mvmt		NBT	NBR	WBLn1	SBL	SBT							
Capacity (veh/h)		-	-	736	1045	-							
HCM Lane V/C Ratio		-	-	0.139	0.015	-							
HCM Control Delay (s)		-	-	10.7	8.5	-							
HCM Lane LOS		-	-	B	A	-							
HCM 95th %tile Q(veh)		-	-	0.5	0	-							

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	541	222	0
Future Vol, veh/h	0	0	0	541	222	0
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	0	0	0	0
Mvmt Flow	0	0	0	541	222	0

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	763	222	222	0	-	0
Stage 1	222	-	-	-	-	-
Stage 2	541	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	375	823	1359	-	-	-
Stage 1	820	-	-	-	-	-
Stage 2	588	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	375	823	1359	-	-	-
Mov Cap-2 Maneuver	375	-	-	-	-	-
Stage 1	820	-	-	-	-	-
Stage 2	588	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1359	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection						
Int Delay, s/veh	9.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	450	0	1	9	24	124
Future Vol, veh/h	450	0	1	9	24	124
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	0	0	0	0
Mvmt Flow	450	0	1	9	24	124
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	97	86	148	0	-	0
Stage 1	86	-	-	-	-	-
Stage 2	11	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	907	978	1446	-	-	-
Stage 1	942	-	-	-	-	-
Stage 2	1017	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	906	978	1446	-	-	-
Mov Cap-2 Maneuver	906	-	-	-	-	-
Stage 1	941	-	-	-	-	-
Stage 2	1017	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.8	0.7		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1446	-	906	-	-	
HCM Lane V/C Ratio	0.001	-	0.497	-	-	
HCM Control Delay (s)	7.5	0	12.8	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	2.8	-	-	

Appendix J
Year 2032 Total Conditions Operational
Worksheets

Queues
1: Highway 417 SB Ramp & Innes

Gloucester Costco Business Centre Gas Bar Addition
2032 Total Weekday AM Peak Hour



Lane Group	EBT	EBR	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	841	153	2076	515	445	712
v/c Ratio	0.33	0.15	0.78	0.40	0.92	0.47
Control Delay	5.8	0.9	8.3	1.0	92.0	1.1
Queue Delay	0.0	0.0	0.3	0.0	0.0	0.0
Total Delay	5.8	0.9	8.6	1.0	92.0	1.1
Queue Length 50th (m)	37.7	0.0	84.2	4.8	72.8	0.0
Queue Length 95th (m)	45.3	4.8	137.3	m4.8	#103.0	0.0
Internal Link Dist (m)	248.5		391.3			
Turn Bay Length (m)		45.0		100.0	75.0	75.0
Base Capacity (vph)	2535	1011	2661	1281	491	1502
Starvation Cap Reductn	0	0	147	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	0.33	0.15	0.83	0.40	0.91	0.47

Intersection Summary

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

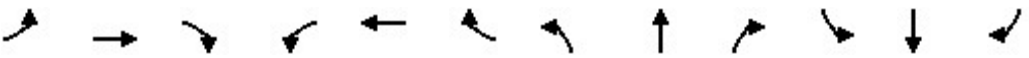
Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

1: Highway 417 SB Ramp & Innes

2032 Total Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗				↘↘		↗
Traffic Volume (veh/h)	0	841	153	0	2076	515	0	0	0	445	0	712
Future Volume (veh/h)	0	841	153	0	2076	515	0	0	0	445	0	712
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	0	1716	1477	0	1786	1758				1772	0	1758
Adj Flow Rate, veh/h	0	841	0	0	2076	0				445	0	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Percent Heavy Veh, %	0	6	23	0	1	3				2	0	3
Cap, veh/h	0	2533		0	2636					483	0	
Arrive On Green	0.00	0.78	0.00	0.00	0.78	0.00				0.15	0.00	0.00
Sat Flow, veh/h	0	3346	1252	0	3483	1490				3274	0	1490
Grp Volume(v), veh/h	0	841	0	0	2076	0				445	0	0
Grp Sat Flow(s),veh/h/ln	0	1630	1252	0	1697	1490				1637	0	1490
Q Serve(g_s), s	0.0	12.4	0.0	0.0	56.2	0.0				21.5	0.0	0.0
Cycle Q Clear(g_c), s	0.0	12.4	0.0	0.0	56.2	0.0				21.5	0.0	0.0
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2533		0	2636					483	0	
V/C Ratio(X)	0.00	0.33		0.00	0.79					0.92	0.00	
Avail Cap(c_a), veh/h	0	2533		0	2636					489	0	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	5.4	0.0	0.0	10.3	0.0				67.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.0	2.5	0.0				22.9	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
%ile BackOfQ(50%),veh/ln	0.0	4.9	0.0	0.0	23.2	0.0				10.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	5.7	0.0	0.0	12.7	0.0				90.2	0.0	0.0
LnGrp LOS	A	A		A	B					F	A	
Approach Vol, veh/h		841			2076						445	
Approach Delay, s/veh		5.7			12.7						90.2	
Approach LOS		A			B						F	
Timer - Assigned Phs		2			6			8				
Phs Duration (G+Y+Rc), s		130.3			130.3			29.7				
Change Period (Y+Rc), s		* 6			* 6			6.1				
Max Green Setting (Gmax), s		* 1.2E2			* 1.2E2			23.9				
Max Q Clear Time (g_c+I1), s		14.4			58.2			23.5				
Green Ext Time (p_c), s		25.6			61.9			0.1				
Intersection Summary												
HCM 6th Ctrl Delay			21.2									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Queues
2: Highway 417 NB Ramp & Innes

Gloucester Costco Business Centre Gas Bar Addition
2032 Total Weekday AM Peak Hour

	→	↘	←	↖	↙	↗
Lane Group	EBT	EBR	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	1050	237	2136	1204	455	696
v/c Ratio	0.41	0.22	0.83	0.84	0.85	0.47
Control Delay	4.4	0.4	6.7	17.7	80.0	1.1
Queue Delay	0.0	0.0	0.4	8.1	0.0	0.0
Total Delay	4.4	0.4	7.1	25.8	80.0	1.1
Queue Length 50th (m)	31.8	0.0	22.6	103.2	72.8	0.0
Queue Length 95th (m)	m35.4	m0.0	m12.4	m63.0	91.7	0.0
Internal Link Dist (m)	391.3		192.3			
Turn Bay Length (m)				180.0	100.0	75.0
Base Capacity (vph)	2555	1075	2581	1426	594	1473
Starvation Cap Reductn	0	0	112	197	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.22	0.87	0.98	0.77	0.47

Intersection Summary

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

2: Highway 417 NB Ramp & Innes

2032 Total Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗	↗↗		↗			
Traffic Volume (veh/h)	0	1050	237	0	2136	1204	455	0	696	0	0	0
Future Volume (veh/h)	0	1050	237	0	2136	1204	455	0	696	0	0	0
Initial Q (Qb), veh	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			
Parking Bus, Adj	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				
Adj Sat Flow, veh/h/ln	0	1758	1617	0	1772	1786	1758	0	1730			
Adj Flow Rate, veh/h	0	1050	0	0	2136	0	455	0	0			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	0	3	13	0	2	1	3	0	5			
Cap, veh/h	0	2567		0	2587		513	0				
Arrive On Green	0.00	0.77	0.00	0.00	1.00	0.00	0.16	0.00	0.00			
Sat Flow, veh/h	0	3428	1371	0	3455	1514	3248	0	1466			
Grp Volume(v), veh/h	0	1050	0	0	2136	0	455	0	0			
Grp Sat Flow(s),veh/h/ln	0	1670	1371	0	1683	1514	1624	0	1466			
Q Serve(g_s), s	0.0	17.0	0.0	0.0	0.0	0.0	22.0	0.0	0.0			
Cycle Q Clear(g_c), s	0.0	17.0	0.0	0.0	0.0	0.0	22.0	0.0	0.0			
Prop In Lane	0.00		1.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2567		0	2587		513	0				
V/C Ratio(X)	0.00	0.41		0.00	0.83		0.89	0.00				
Avail Cap(c_a), veh/h	0	2567		0	2587		593	0				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	0.00	0.00	0.09	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	0.0	6.3	0.0	0.0	0.0	0.0	66.0	0.0	0.0			
Incr Delay (d2), s/veh	0.0	0.5	0.0	0.0	0.3	0.0	13.9	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			
%ile BackOfQ(50%),veh/ln	0.0	6.9	0.0	0.0	0.1	0.0	10.5	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	6.7	0.0	0.0	0.3	0.0	79.8	0.0	0.0			
LnGrp LOS	A	A		A	A		E	A				
Approach Vol, veh/h		1050			2136			455				
Approach Delay, s/veh		6.7			0.3			79.8				
Approach LOS		A			A			E				
Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		129.0		31.0		129.0						
Change Period (Y+Rc), s		* 6		* 5.8		* 6						
Max Green Setting (Gmax), s		* 1.2E2		* 29		* 1.2E2						
Max Q Clear Time (g_c+I1), s		19.0		24.0		2.0						
Green Ext Time (p_c), s		36.8		1.3		107.4						
Intersection Summary												
HCM 6th Ctrl Delay				12.1								
HCM 6th LOS				B								
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.												

Queues
3: Innes Crossing & Innes

Gloucester Costco Business Centre Gas Bar Addition

2032 Total Weekday AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	161	1485	25	3164	53	89	41	3	122
v/c Ratio	1.79	0.50	0.32	1.11	0.06	0.26	0.13	0.01	0.28
Control Delay	437.4	12.1	89.0	60.6	0.3	44.4	48.8	46.0	16.7
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	437.4	12.1	89.0	60.6	0.3	44.4	48.8	46.0	16.7
Queue Length 50th (m)	~77.4	94.5	7.9	~422.2	0.1	19.8	10.3	0.7	7.7
Queue Length 95th (m)	#126.5	107.3	m7.4	m44.9	m0.3	36.5	21.3	3.7	25.3
Internal Link Dist (m)		192.3		193.0		122.5		129.2	
Turn Bay Length (m)	50.0		45.0		90.0		45.0		45.0
Base Capacity (vph)	90	2945	90	2846	905	346	311	443	437
Starvation Cap Reductn	0	286	0	59	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	1.79	0.56	0.28	1.14	0.06	0.26	0.13	0.01	0.28

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

3: Innes Crossing & Innes

2032 Total Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 			 	
Traffic Volume (veh/h)	161	1479	6	25	3164	53	48	16	25	41	3	122
Future Volume (veh/h)	161	1479	6	25	3164	53	48	16	25	41	3	122
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	1800	1744	1800	1800	1786	1800	1660	1800	1744	1800	1800	1786
Adj Flow Rate, veh/h	161	1479	6	25	3164	53	48	16	25	41	3	122
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	4	0	0	1	0	10	0	4	0	0	1
Cap, veh/h	90	2987	12	36	2822	881	213	73	98	374	439	368
Arrive On Green	0.02	0.20	0.20	0.02	0.58	0.58	0.24	0.24	0.24	0.24	0.24	0.24
Sat Flow, veh/h	1714	4894	20	1714	4876	1521	732	298	403	1386	1800	1512
Grp Volume(v), veh/h	161	959	526	25	3164	53	89	0	0	41	3	122
Grp Sat Flow(s),veh/h/ln	1714	1587	1740	1714	1625	1521	1433	0	0	1386	1800	1512
Q Serve(g_s), s	8.4	42.9	42.9	2.3	92.6	2.4	6.0	0.0	0.0	0.0	0.2	10.6
Cycle Q Clear(g_c), s	8.4	42.9	42.9	2.3	92.6	2.4	7.7	0.0	0.0	4.3	0.2	10.6
Prop In Lane	1.00		0.01	1.00		1.00	0.54		0.28	1.00		1.00
Lane Grp Cap(c), veh/h	90	1937	1062	36	2822	881	384	0	0	374	439	368
V/C Ratio(X)	1.79	0.50	0.50	0.70	1.12	0.06	0.23	0.00	0.00	0.11	0.01	0.33
Avail Cap(c_a), veh/h	90	1937	1062	90	2822	881	384	0	0	374	439	368
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)	0.90	0.90	0.90	0.09	0.09	0.09	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	78.6	42.0	42.0	77.8	33.7	14.7	48.6	0.0	0.0	47.4	45.8	49.8
Incr Delay (d2), s/veh	392.0	0.8	1.5	2.2	55.1	0.0	1.4	0.0	0.0	0.6	0.0	2.4
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	13.8	18.9	20.9	1.1	52.7	0.9	3.2	0.0	0.0	1.4	0.1	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	470.6	42.8	43.5	80.0	88.8	14.7	50.0	0.0	0.0	48.0	45.9	52.2
LnGrp LOS	F	D	D	F	F	B	D	A	A	D	D	D
Approach Vol, veh/h	1646			3242			89			166		
Approach Delay, s/veh	84.9			87.5			50.0			51.0		
Approach LOS	F			F			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.0	104.0		46.0	15.0	99.0		46.0				
Change Period (Y+Rc), s	* 6.6	6.4		7.0	* 6.6	6.4		7.0				
Max Green Setting (Gmax), s	* 8.4	92.6		39.0	* 8.4	92.6		39.0				
Max Q Clear Time (g_c+I1), s	4.3	44.9		9.7	10.4	94.6		12.6				
Green Ext Time (p_c), s	0.0	36.3		1.3	0.0	0.0		1.0				

Intersection Summary

HCM 6th Ctrl Delay 84.9

HCM 6th LOS F

Notes

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

Queues
4: Cryville & Innes

Gloucester Costco Business Centre Gas Bar Addition
2032 Total Weekday AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	128	1142	258	87	2764	556	290	74	80	130	37	166
v/c Ratio	1.13	0.47	0.31	0.80	1.11	0.66	1.74	0.20	0.20	0.76	0.10	0.41
Control Delay	199.9	11.6	0.9	107.4	84.1	11.9	394.9	53.6	4.3	101.6	51.5	20.4
Queue Delay	0.0	0.0	0.0	0.0	0.3	1.9	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	199.9	11.6	0.9	107.4	84.4	13.9	394.9	53.6	4.3	101.6	51.5	20.4
Queue Length 50th (m)	~48.0	24.6	0.2	26.9	~368.5	84.4	~70.0	19.6	0.0	21.4	9.6	12.6
Queue Length 95th (m)	#92.6	27.3	0.2	m33.3	#388.5	80.1	#100.9	34.7	6.7	#37.8	20.1	35.2
Internal Link Dist (m)		193.0			155.0			42.3			210.4	
Turn Bay Length (m)	70.0		85.0	45.0		60.0	55.0		45.0	90.0		100.0
Base Capacity (vph)	113	2422	838	112	2484	848	167	365	393	170	387	403
Starvation Cap Reductn	0	0	0	0	201	158	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	276	0	0	0	0	0	0	6
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.13	0.47	0.31	0.78	1.25	0.81	1.74	0.20	0.20	0.76	0.10	0.42

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

4: Cryville & Innes

2032 Total Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 			 		
Traffic Volume (veh/h)	128	1142	258	87	2764	556	290	74	80	130	37	166
Future Volume (veh/h)	128	1142	258	87	2764	556	290	74	80	130	37	166
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		0.99	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	1758	1744	1716	1744	1786	1772	1730	1716	1730	1758	1800	1744
Adj Flow Rate, veh/h	128	1142	0	87	2764	0	290	74	80	130	37	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, %	3	4	6	4	1	2	5	6	5	3	0	4
Cap, veh/h	113	2424		105	2462		168	366	310	171	384	
Arrive On Green	0.02	0.17	0.00	0.02	0.17	0.00	0.05	0.21	0.21	0.05	0.21	0.00
Sat Flow, veh/h	1674	4761	1454	1661	4876	1502	3196	1716	1454	3248	1800	1478
Grp Volume(v), veh/h	128	1142	0	87	2764	0	290	74	80	130	37	0
Grp Sat Flow(s),veh/h/ln	1674	1587	1454	1661	1625	1502	1598	1716	1454	1624	1800	1478
Q Serve(g_s), s	10.8	34.7	0.0	8.4	80.8	0.0	8.4	5.7	5.9	6.3	2.6	0.0
Cycle Q Clear(g_c), s	10.8	34.7	0.0	8.4	80.8	0.0	8.4	5.7	5.9	6.3	2.6	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	113	2424		105	2462		168	366	310	171	384	
V/C Ratio(X)	1.13	0.47		0.83	1.12		1.73	0.20	0.26	0.76	0.10	
Avail Cap(c_a), veh/h	113	2424		112	2462		168	366	310	171	384	
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.86	0.86	0.00	0.44	0.44	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	78.2	47.1	0.0	77.4	66.7	0.0	75.8	51.8	34.4	74.8	50.6	0.0
Incr Delay (d2), s/veh	118.6	0.6	0.0	18.7	58.0	0.0	351.5	1.2	2.0	18.2	0.5	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	8.7	15.2	0.0	4.4	49.2	0.0	11.8	2.7	2.5	3.2	1.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	196.8	47.7	0.0	96.2	124.6	0.0	427.3	53.0	36.4	93.0	51.1	0.0
LnGrp LOS	F	D		F	F		F	D	D	F	D	
Approach Vol, veh/h		1270			2851			444			167	
Approach Delay, s/veh		62.7			123.8			294.5			83.7	
Approach LOS		E			F			F			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.3	87.7	15.0	41.0	17.0	87.0	15.0	41.0				
Change Period (Y+Rc), s	* 6.2	* 6.2	* 6.6	6.9	* 6.2	* 6.2	* 6.6	6.9				
Max Green Setting (Gmax), s	* 11	* 81	* 8.4	34.1	* 11	* 81	* 8.4	34.1				
Max Q Clear Time (g_c+I1), s	10.4	36.7	8.3	7.9	12.8	82.8	10.4	4.6				
Green Ext Time (p_c), s	0.0	27.0	0.0	1.5	0.0	0.0	0.0	0.4				

Intersection Summary

HCM 6th Ctrl Delay	122.0
HCM 6th LOS	F

Notes

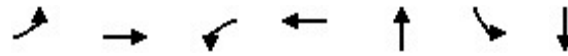
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

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

Queues
5: Stonehenge Crescent & Innes

Gloucester Costco Business Centre Gas Bar Addition

2032 Total Weekday AM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	18	1249	70	3328	39	15	93
v/c Ratio	0.24	0.35	0.56	0.83	0.41	0.23	0.58
Control Delay	71.9	2.7	87.2	13.3	42.7	79.9	30.0
Queue Delay	0.0	0.0	0.0	46.2	0.0	0.0	0.0
Total Delay	71.9	2.7	87.2	59.5	42.7	79.9	30.1
Queue Length 50th (m)	6.1	11.0	21.9	224.0	2.8	4.7	1.6
Queue Length 95th (m)	m12.5	14.6	38.1	305.8	15.2	12.6	19.6
Internal Link Dist (m)		155.0		158.8	65.7		136.4
Turn Bay Length (m)	40.0		45.0			25.0	
Base Capacity (vph)	130	3583	145	3990	318	294	405
Starvation Cap Reductn	0	416	0	0	0	0	0
Spillback Cap Reductn	0	0	0	1014	0	0	17
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.39	0.48	1.12	0.12	0.05	0.24

Intersection Summary

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

5: Stonehenge Crescent & Innes

2032 Total Weekday AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 			 	
Traffic Volume (veh/h)	18	1239	10	70	3319	9	7	2	30	15	5	88
Future Volume (veh/h)	18	1239	10	70	3319	9	7	2	30	15	5	88
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	0.99		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	1716	1744	1337	1772	1786	1800	1800	1800	1800	1800	1800	1786
Adj Flow Rate, veh/h	18	1239	10	70	3319	9	7	2	30	15	5	88
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, %	6	4	33	2	1	0	0	0	0	0	0	1
Cap, veh/h	28	3495	28	87	3775	10	40	21	113	160	9	155
Arrive On Green	0.02	0.72	0.72	0.05	0.75	0.75	0.11	0.11	0.11	0.11	0.11	0.11
Sat Flow, veh/h	1634	4871	39	1688	5020	14	122	191	1044	1385	82	1436
Grp Volume(v), veh/h	18	807	442	70	2148	1180	39	0	0	15	0	93
Grp Sat Flow(s),veh/h/ln	1634	1587	1737	1688	1625	1783	1357	0	0	1385	0	1518
Q Serve(g_s), s	1.8	15.4	15.4	6.6	77.3	77.6	0.0	0.0	0.0	0.0	0.0	9.3
Cycle Q Clear(g_c), s	1.8	15.4	15.4	6.6	77.3	77.6	9.4	0.0	0.0	2.7	0.0	9.3
Prop In Lane	1.00		0.02	1.00		0.01	0.18		0.77	1.00		0.95
Lane Grp Cap(c), veh/h	28	2277	1246	87	2444	1341	173	0	0	160	0	164
V/C Ratio(X)	0.64	0.35	0.35	0.80	0.88	0.88	0.23	0.00	0.00	0.09	0.00	0.57
Avail Cap(c_a), veh/h	131	2277	1246	135	2444	1341	341	0	0	318	0	337
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)	0.87	0.87	0.87	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	78.1	8.6	8.6	75.1	14.5	14.6	65.3	0.0	0.0	64.9	0.0	67.8
Incr Delay (d2), s/veh	19.1	0.4	0.7	17.4	4.9	8.5	0.7	0.0	0.0	0.3	0.0	3.1
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	0.9	6.1	6.8	3.4	31.6	36.2	1.6	0.0	0.0	0.6	0.0	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	97.3	8.9	9.3	92.4	19.4	23.1	66.0	0.0	0.0	65.2	0.0	70.9
LnGrp LOS	F	A	A	F	B	C	E	A	A	E	A	E
Approach Vol, veh/h		1267			3398			39			108	
Approach Delay, s/veh		10.3			22.2			66.0			70.1	
Approach LOS		B			C			E			E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.5	120.8		24.7	9.0	126.3		24.7				
Change Period (Y+Rc), s	* 6.2	6.0		7.5	* 6.2	6.0		7.5				
Max Green Setting (Gmax), s	* 13	92.0		35.5	* 13	92.0		35.5				
Max Q Clear Time (g_c+I1), s	8.6	17.4		11.4	3.8	79.6		11.3				
Green Ext Time (p_c), s	0.1	39.8		0.4	0.0	12.3		1.4				
Intersection Summary												
HCM 6th Ctrl Delay				20.5								
HCM 6th LOS				C								
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	0	136	0	310	16	49	333	0
Future Vol, veh/h	0	0	0	0	0	136	0	310	16	49	333	0
Conflicting Peds, #/hr	0	0	4	4	0	0	0	0	2	2	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-
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	0	0	0	4	0	7	6	2	7	4
Mvmt Flow	0	0	0	0	0	136	0	310	16	49	333	0
Major/Minor				Minor1		Major1		Major2				
Conflicting Flow All				-	-	165	-	0	0	328	0	0
Stage 1				-	-	-	-	-	-	-	-	-
Stage 2				-	-	-	-	-	-	-	-	-
Critical Hdwy				-	-	6.96	-	-	-	4.13	-	-
Critical Hdwy Stg 1				-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2				-	-	-	-	-	-	-	-	-
Follow-up Hdwy				-	-	3.338	-	-	-	2.219	-	-
Pot Cap-1 Maneuver				0	0	845	0	-	-	1230	-	0
Stage 1				0	0	-	0	-	-	-	-	0
Stage 2				0	0	-	0	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver				-	0	843	-	-	-	1228	-	-
Mov Cap-2 Maneuver				-	0	-	-	-	-	-	-	-
Stage 1				-	0	-	-	-	-	-	-	-
Stage 2				-	0	-	-	-	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s				10.1		0		1				
HCM LOS				B								
Minor Lane/Major Mvmt		NBT	NBRWBLn1	SBL	SBT							
Capacity (veh/h)		-	-	843	1228	-						
HCM Lane V/C Ratio		-	-	0.161	0.04	-						
HCM Control Delay (s)		-	-	10.1	8.1	-						
HCM Lane LOS		-	-	B	A	-						
HCM 95th %tile Q(veh)		-	-	0.6	0.1	-						

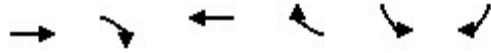
Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	65	0	0	259	168	157
Future Vol, veh/h	65	0	0	259	168	157
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage 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	0	0	0	0
Mvmt Flow	65	0	0	259	168	157
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	506	247	325	0	-	0
Stage 1	247	-	-	-	-	-
Stage 2	259	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	530	797	1246	-	-	-
Stage 1	799	-	-	-	-	-
Stage 2	789	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	530	797	1246	-	-	-
Mov Cap-2 Maneuver	530	-	-	-	-	-
Stage 1	799	-	-	-	-	-
Stage 2	789	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.7	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1246	-	530	-	-	
HCM Lane V/C Ratio	-	-	0.123	-	-	
HCM Control Delay (s)	0	-	12.7	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.4	-	-	

Intersection						
Int Delay, s/veh	5.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	209	0	3	49	22	145
Future Vol, veh/h	209	0	3	49	22	145
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, %	4	0	0	12	27	0
Mvmt Flow	209	0	3	49	22	145
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	150	95	167	0	-	0
Stage 1	95	-	-	-	-	-
Stage 2	55	-	-	-	-	-
Critical Hdwy	6.44	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.44	-	-	-	-	-
Critical Hdwy Stg 2	5.44	-	-	-	-	-
Follow-up Hdwy	3.536	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	837	967	1423	-	-	-
Stage 1	924	-	-	-	-	-
Stage 2	962	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	835	967	1423	-	-	-
Mov Cap-2 Maneuver	835	-	-	-	-	-
Stage 1	922	-	-	-	-	-
Stage 2	962	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.7	0.4		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1423	-	835	-	-	
HCM Lane V/C Ratio	0.002	-	0.25	-	-	
HCM Control Delay (s)	7.5	0	10.7	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	1	-	-	

Queues
1: Highway 417 SB Ramp & Innes

Gloucester Costco Business Centre Gas Bar Addition

2032 Total Weekday PM Peak Hour



Lane Group	EBT	EBR	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	1487	400	890	618	1082	308
v/c Ratio	0.75	0.42	0.47	0.55	0.97	0.23
Control Delay	24.9	8.3	8.5	2.3	66.3	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.9	8.3	8.5	2.3	66.3	0.4
Queue Length 50th (m)	154.7	24.3	30.4	4.9	151.4	0.0
Queue Length 95th (m)	182.7	45.6	44.9	6.1	#194.8	0.0
Internal Link Dist (m)	248.5		391.3			
Turn Bay Length (m)		45.0		100.0	75.0	75.0
Base Capacity (vph)	1987	962	1911	1131	1123	1311
Starvation Cap Reductn	0	0	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	0.75	0.42	0.47	0.55	0.96	0.23

Intersection Summary

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

1: Highway 417 SB Ramp & Innes

2032 Total Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗				↘↘		↗
Traffic Volume (veh/h)	0	1487	400	0	890	618	0	0	0	1082	0	308
Future Volume (veh/h)	0	1487	400	0	890	618	0	0	0	1082	0	308
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	0	1786	1758	0	1730	1758				1800	0	1547
Adj Flow Rate, veh/h	0	1487	0	0	890	0				1082	0	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Percent Heavy Veh, %	0	1	3	0	5	3				0	0	18
Cap, veh/h	0	1963		0	1902					1114	0	
Arrive On Green	0.00	0.58	0.00	0.00	0.58	0.00				0.33	0.00	0.00
Sat Flow, veh/h	0	3483	1490	0	3373	1490				3326	0	1311
Grp Volume(v), veh/h	0	1487	0	0	890	0				1082	0	0
Grp Sat Flow(s),veh/h/ln	0	1697	1490	0	1643	1490				1663	0	1311
Q Serve(g_s), s	0.0	46.0	0.0	0.0	21.9	0.0				44.9	0.0	0.0
Cycle Q Clear(g_c), s	0.0	46.0	0.0	0.0	21.9	0.0				44.9	0.0	0.0
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1963		0	1902					1114	0	
V/C Ratio(X)	0.00	0.76		0.00	0.47					0.97	0.00	
Avail Cap(c_a), veh/h	0	1963		0	1902					1114	0	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	22.1	0.0	0.0	17.0	0.0				45.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	2.8	0.0	0.0	0.8	0.0				20.3	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
%ile BackOfQ(50%),veh/ln	0.0	20.4	0.0	0.0	9.3	0.0				22.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	24.9	0.0	0.0	17.9	0.0				66.2	0.0	0.0
LnGrp LOS	A	C		A	B					E	A	
Approach Vol, veh/h		1487			890					1082		
Approach Delay, s/veh		24.9			17.9					66.2		
Approach LOS		C			B					E		
Timer - Assigned Phs		2			6			8				
Phs Duration (G+Y+Rc), s		87.0			87.0			53.0				
Change Period (Y+Rc), s		* 6			* 6			6.1				
Max Green Setting (Gmax), s		* 81			* 81			46.9				
Max Q Clear Time (g_c+I1), s		48.0			23.9			46.9				
Green Ext Time (p_c), s		27.9			23.7			0.0				
Intersection Summary												
HCM 6th Ctrl Delay			36.0									
HCM 6th LOS			D									

Notes

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

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

Queues
2: Highway 417 NB Ramp & Innes

Gloucester Costco Business Centre Gas Bar Addition
2032 Total Weekday PM Peak Hour

	→	↘	←	↖	↙	↗
Lane Group	EBT	EBR	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	2187	383	1325	816	183	794
v/c Ratio	0.78	0.30	0.48	0.58	0.63	0.52
Control Delay	7.7	0.8	0.7	7.7	69.8	1.3
Queue Delay	1.9	0.0	0.1	0.4	0.0	0.2
Total Delay	9.6	0.8	0.8	8.1	69.8	1.5
Queue Length 50th (m)	153.8	2.8	3.5	57.2	25.4	0.0
Queue Length 95th (m)	m162.8	m6.8	4.8	58.5	36.8	0.0
Internal Link Dist (m)	391.3		192.3			
Turn Bay Length (m)				180.0	100.0	75.0
Base Capacity (vph)	2810	1265	2755	1398	587	1513
Starvation Cap Reductn	0	0	426	210	0	0
Spillback Cap Reductn	439	0	0	0	0	191
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.30	0.57	0.69	0.31	0.60

Intersection Summary

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

2: Highway 417 NB Ramp & Innes

2032 Total Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗	↗↗		↗			
Traffic Volume (veh/h)	0	2187	383	0	1325	816	183	0	794	0	0	0
Future Volume (veh/h)	0	2187	383	0	1325	816	183	0	794	0	0	0
Initial Q (Qb), veh	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			
Parking Bus, Adj	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				
Adj Sat Flow, veh/h/ln	0	1800	1772	0	1772	1786	1533	0	1786			
Adj Flow Rate, veh/h	0	2187	0	0	1325	0	183	0	0			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	0	0	2	0	2	1	19	0	1			
Cap, veh/h	0	2843		0	2799		239	0				
Arrive On Green	0.00	0.83	0.00	0.00	0.83	0.00	0.08	0.00	0.00			
Sat Flow, veh/h	0	3510	1502	0	3455	1514	2833	0	1514			
Grp Volume(v), veh/h	0	2187	0	0	1325	0	183	0	0			
Grp Sat Flow(s),veh/h/ln	0	1710	1502	0	1683	1514	1416	0	1514			
Q Serve(g_s), s	0.0	41.9	0.0	0.0	15.3	0.0	8.9	0.0	0.0			
Cycle Q Clear(g_c), s	0.0	41.9	0.0	0.0	15.3	0.0	8.9	0.0	0.0			
Prop In Lane	0.00		1.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2843		0	2799		239	0				
V/C Ratio(X)	0.00	0.77		0.00	0.47		0.76	0.00				
Avail Cap(c_a), veh/h	0	2843		0	2799		591	0				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	0.00	0.00	0.57	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	0.0	5.5	0.0	0.0	3.3	0.0	62.7	0.0	0.0			
Incr Delay (d2), s/veh	0.0	2.1	0.0	0.0	0.3	0.0	5.0	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			
%ile BackOfQ(50%),veh/ln	0.0	16.1	0.0	0.0	5.6	0.0	3.5	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	7.6	0.0	0.0	3.6	0.0	67.8	0.0	0.0			
LnGrp LOS	A	A		A	A		E	A				
Approach Vol, veh/h		2187			1325			183				
Approach Delay, s/veh		7.6			3.6			67.8				
Approach LOS		A			A			E				
Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		122.4		17.6		122.4						
Change Period (Y+Rc), s		* 6		* 5.8		* 6						
Max Green Setting (Gmax), s		* 99		* 29		* 99						
Max Q Clear Time (g_c+I1), s		43.9		10.9		17.3						
Green Ext Time (p_c), s		53.1		1.0		49.1						
Intersection Summary												
HCM 6th Ctrl Delay			9.2									
HCM 6th LOS			A									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.												

Queues
3: Innes Crossing & Innes

Gloucester Costco Business Centre Gas Bar Addition

2032 Total Weekday PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	139	2743	20	1900	77	92	98	14	192
v/c Ratio	0.91	0.99	0.24	0.80	0.10	0.22	0.27	0.03	0.35
Control Delay	115.7	35.9	73.4	12.5	1.6	33.2	42.0	37.1	9.5
Queue Delay	0.0	4.5	0.0	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	115.7	40.5	73.4	12.9	1.6	33.2	42.0	37.1	9.5
Queue Length 50th (m)	40.5	~303.0	5.1	55.5	1.2	15.9	21.3	2.8	4.3
Queue Length 95th (m)	m#65.3	#337.4	m7.1	62.0	m2.0	30.8	37.4	8.4	23.3
Internal Link Dist (m)		192.3		193.0		122.5		129.2	
Turn Bay Length (m)	50.0		45.0		90.0		45.0		45.0
Base Capacity (vph)	153	2761	139	2386	783	414	359	507	548
Starvation Cap Reductn	0	50	0	137	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	0.91	1.01	0.14	0.84	0.10	0.22	0.27	0.03	0.35

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

3: Innes Crossing & Innes

2032 Total Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 			 	
Traffic Volume (veh/h)	139	2736	7	20	1900	77	43	19	30	98	14	192
Future Volume (veh/h)	139	2736	7	20	1900	77	43	19	30	98	14	192
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		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	1800	1786	1603	1660	1772	1800	1730	1800	1758	1800	1800	1800
Adj Flow Rate, veh/h	139	2736	7	20	1900	77	43	19	30	98	14	192
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	14	10	2	0	5	0	3	0	0	0
Cap, veh/h	152	2808	7	31	2370	742	208	94	128	427	501	424
Arrive On Green	0.12	0.74	0.74	0.02	0.49	0.49	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1714	5021	13	1581	4837	1515	610	336	458	1374	1800	1520
Grp Volume(v), veh/h	139	1770	973	20	1900	77	92	0	0	98	14	192
Grp Sat Flow(s),veh/h/ln	1714	1625	1784	1581	1612	1515	1404	0	0	1374	1800	1520
Q Serve(g_s), s	11.2	70.9	71.2	1.8	46.2	3.8	4.4	0.0	0.0	1.9	0.8	14.6
Cycle Q Clear(g_c), s	11.2	70.9	71.2	1.8	46.2	3.8	6.6	0.0	0.0	8.5	0.8	14.6
Prop In Lane	1.00		0.01	1.00		1.00	0.47		0.33	1.00		1.00
Lane Grp Cap(c), veh/h	152	1818	997	31	2370	742	429	0	0	427	501	424
V/C Ratio(X)	0.92	0.97	0.97	0.66	0.80	0.10	0.21	0.00	0.00	0.23	0.03	0.45
Avail Cap(c_a), veh/h	152	1818	997	140	2370	742	429	0	0	427	501	424
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)	0.64	0.64	0.64	0.57	0.57	0.57	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	61.2	17.0	17.0	68.2	30.0	19.2	38.7	0.0	0.0	39.6	36.7	41.7
Incr Delay (d2), s/veh	36.4	11.8	17.6	12.8	1.7	0.2	1.1	0.0	0.0	1.3	0.1	3.5
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	6.6	28.4	32.8	0.8	19.4	1.5	2.8	0.0	0.0	3.0	0.4	6.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	97.6	28.8	34.6	81.0	31.7	19.3	39.8	0.0	0.0	40.8	36.8	45.2
LnGrp LOS	F	C	C	F	C	B	D	A	A	D	D	D
Approach Vol, veh/h		2882			1997			92			304	
Approach Delay, s/veh		34.1			31.7			39.8			43.4	
Approach LOS		C			C			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.3	84.7		46.0	19.0	75.0		46.0				
Change Period (Y+Rc), s	* 6.6	6.4		7.0	* 6.6	6.4		7.0				
Max Green Setting (Gmax), s	* 12	68.6		39.0	* 12	68.6		39.0				
Max Q Clear Time (g_c+I1), s	3.8	73.2		8.6	13.2	48.2		16.6				
Green Ext Time (p_c), s	0.0	0.0		1.4	0.0	19.5		1.9				

Intersection Summary

HCM 6th Ctrl Delay	33.8
HCM 6th LOS	C

Notes

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

Queues
4: Cryville & Innes

Gloucester Costco Business Centre Gas Bar Addition

2032 Total Weekday PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	88	2328	415	143	1380	241	382	63	170	594	129	206
v/c Ratio	0.72	1.28	0.60	1.08	0.76	0.37	0.92	0.14	0.35	1.44	0.29	0.43
Control Delay	91.8	160.1	14.1	166.9	32.2	5.4	88.0	42.6	11.4	254.4	45.3	15.3
Queue Delay	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.8	160.1	14.1	166.9	32.4	5.4	88.0	42.6	11.4	254.4	45.3	15.3
Queue Length 50th (m)	26.0	~294.4	32.2	~41.8	122.7	12.9	54.6	13.8	4.7	~114.7	29.3	11.2
Queue Length 95th (m)	m27.2	m#298.2	m34.7	#90.1	141.4	10.0	#83.6	26.2	23.8	#151.1	48.0	33.8
Internal Link Dist (m)		193.0			155.0			42.3			210.4	
Turn Bay Length (m)	70.0		85.0	45.0		60.0	55.0		45.0	90.0		100.0
Base Capacity (vph)	129	1820	693	133	1821	659	416	443	480	412	443	481
Starvation Cap Reductn	0	0	0	0	59	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	37	0	0	0	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	1.28	0.60	1.08	0.78	0.37	0.92	0.14	0.35	1.44	0.29	0.43

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

4: Cryville & Innes

2032 Total Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 			 		
Traffic Volume (veh/h)	88	2328	415	143	1380	241	382	63	170	594	129	206
Future Volume (veh/h)	88	2328	415	143	1380	241	382	63	170	594	129	206
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		0.99	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	1758	1786	1786	1800	1772	1772	1800	1800	1800	1786	1800	1772
Adj Flow Rate, veh/h	88	2328	0	143	1380	0	382	63	170	594	129	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, %	3	1	1	0	2	2	0	0	0	1	0	2
Cap, veh/h	107	1804		132	1853		413	438	368	410	438	
Arrive On Green	0.09	0.49	0.00	0.03	0.13	0.00	0.12	0.24	0.24	0.12	0.24	0.00
Sat Flow, veh/h	1674	4876	1514	1714	4837	1502	3326	1800	1512	3300	1800	1502
Grp Volume(v), veh/h	88	2328	0	143	1380	0	382	63	170	594	129	0
Grp Sat Flow(s),veh/h/ln	1674	1625	1514	1714	1612	1502	1663	1800	1512	1650	1800	1502
Q Serve(g_s), s	7.2	51.8	0.0	10.8	38.5	0.0	15.9	3.8	10.6	17.4	8.2	0.0
Cycle Q Clear(g_c), s	7.2	51.8	0.0	10.8	38.5	0.0	15.9	3.8	10.6	17.4	8.2	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	107	1804		132	1853		413	438	368	410	438	
V/C Ratio(X)	0.82	1.29		1.08	0.74		0.92	0.14	0.46	1.45	0.29	
Avail Cap(c_a), veh/h	129	1804		132	1853		413	438	368	410	438	
HCM Platoon Ratio	1.33	1.33	1.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.16	0.16	0.00	0.86	0.86	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	63.2	35.6	0.0	68.2	54.6	0.0	60.6	41.5	28.3	61.3	43.1	0.0
Incr Delay (d2), s/veh	5.7	131.4	0.0	96.0	2.4	0.0	26.4	0.7	4.1	215.1	1.7	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	3.3	42.9	0.0	8.6	17.4	0.0	8.6	1.9	4.7	20.0	4.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.9	167.0	0.0	164.2	56.9	0.0	87.0	42.2	32.4	276.4	44.8	0.0
LnGrp LOS	E	F		F	E		F	D	C	F	D	
Approach Vol, veh/h		2416			1523			615			723	
Approach Delay, s/veh		163.4			67.0			67.3			235.1	
Approach LOS		F			E			E			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.0	58.0	24.0	41.0	15.2	59.8	24.0	41.0				
Change Period (Y+Rc), s	* 6.2	* 6.2	* 6.6	6.9	* 6.2	* 6.2	* 6.6	6.9				
Max Green Setting (Gmax), s	* 11	* 52	* 17	34.1	* 11	* 52	* 17	34.1				
Max Q Clear Time (g_c+I1), s	12.8	53.8	19.4	12.6	9.2	40.5	17.9	10.2				
Green Ext Time (p_c), s	0.0	0.0	0.0	1.8	0.0	10.0	0.0	1.7				

Intersection Summary

HCM 6th Ctrl Delay	134.2
HCM 6th LOS	F

Notes

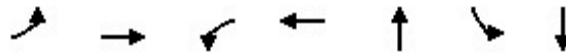
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

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

Queues
5: Stonehenge Crescent & Innes

Gloucester Costco Business Centre Gas Bar Addition

2032 Total Weekday PM Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	72	3001	65	1716	105	22	69
v/c Ratio	0.51	0.83	0.49	0.50	0.64	0.34	0.43
Control Delay	72.2	10.1	73.8	10.4	41.0	74.9	24.1
Queue Delay	0.0	1.7	0.0	0.0	0.0	0.0	0.0
Total Delay	72.2	11.7	73.8	10.4	41.0	74.9	24.1
Queue Length 50th (m)	21.1	78.0	17.6	69.5	9.2	6.0	1.6
Queue Length 95th (m)	m15.5	m54.5	32.2	103.1	27.4	14.6	15.9
Internal Link Dist (m)		155.0		158.8	65.7		136.4
Turn Bay Length (m)	40.0		45.0			25.0	
Base Capacity (vph)	145	3606	137	3447	422	239	431
Starvation Cap Reductn	0	412	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.94	0.47	0.50	0.25	0.09	0.16

Intersection Summary

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

5: Stonehenge Crescent & Innes

2032 Total Weekday PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	2993	8	65	1692	24	23	11	71	22	6	63
Future Volume (veh/h)	72	2993	8	65	1692	24	23	11	71	22	6	63
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		0.98	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	1800	1786	1800	1800	1772	1800	1730	1800	1800	1800	1800	1772
Adj Flow Rate, veh/h	72	2993	8	65	1692	24	23	11	71	22	6	63
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	0	0	2	0	5	0	0	0	0	2
Cap, veh/h	90	3412	9	82	3317	47	60	36	135	196	17	183
Arrive On Green	0.05	0.68	0.68	0.05	0.67	0.67	0.13	0.13	0.13	0.13	0.13	0.13
Sat Flow, veh/h	1714	5020	13	1714	4914	70	214	277	1026	1321	132	1388
Grp Volume(v), veh/h	72	1937	1064	65	1110	606	105	0	0	22	0	69
Grp Sat Flow(s),veh/h/ln	1714	1625	1783	1714	1612	1759	1518	0	0	1321	0	1520
Q Serve(g_s), s	5.8	66.1	66.4	5.3	23.9	23.9	2.5	0.0	0.0	0.0	0.0	5.8
Cycle Q Clear(g_c), s	5.8	66.1	66.4	5.3	23.9	23.9	8.8	0.0	0.0	3.2	0.0	5.8
Prop In Lane	1.00		0.01	1.00		0.04	0.22		0.68	1.00		0.91
Lane Grp Cap(c), veh/h	90	2209	1212	82	2177	1187	231	0	0	196	0	200
V/C Ratio(X)	0.80	0.88	0.88	0.79	0.51	0.51	0.45	0.00	0.00	0.11	0.00	0.34
Avail Cap(c_a), veh/h	108	2209	1212	108	2177	1187	412	0	0	357	0	385
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)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	65.6	17.8	17.8	66.0	11.3	11.3	56.5	0.0	0.0	54.2	0.0	55.3
Incr Delay (d2), s/veh	3.3	0.5	0.9	25.0	0.9	1.6	1.4	0.0	0.0	0.2	0.0	1.0
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	2.7	26.3	29.1	3.0	9.7	10.8	3.8	0.0	0.0	0.8	0.0	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.9	18.3	18.8	91.0	12.1	12.8	57.9	0.0	0.0	54.4	0.0	56.3
LnGrp LOS	E	B	B	F	B	B	E	A	A	D	A	E
Approach Vol, veh/h	3073				1781				105			
Approach Delay, s/veh	19.6				15.3				57.9			
Approach LOS	B				B				E			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.9	101.2		25.9	13.6	100.5		25.9				
Change Period (Y+Rc), s	* 6.2	6.0		7.5	* 6.2	6.0		7.5				
Max Green Setting (Gmax), s	* 8.8	76.0		35.5	* 8.8	76.0		35.5				
Max Q Clear Time (g_c+I1), s	7.3	68.4		10.8	7.8	25.9		7.8				
Green Ext Time (p_c), s	0.0	7.6		1.5	0.0	42.1		1.1				

Intersection Summary

HCM 6th Ctrl Delay	19.5
HCM 6th LOS	B

Notes

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

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	0	71	0	544	11	49	638	0
Future Vol, veh/h	0	0	0	0	0	71	0	544	11	49	638	0
Conflicting Peds, #/hr	1	0	2	2	0	1	2	0	3	3	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-
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	0	0	0	0	0	0	0	2	0	0
Mvmt Flow	0	0	0	0	0	71	0	544	11	49	638	0
Major/Minor				Minor1		Major1		Major2				
Conflicting Flow All				-	-	282	-	0	0	558	0	0
Stage 1				-	-	-	-	-	-	-	-	-
Stage 2				-	-	-	-	-	-	-	-	-
Critical Hdwy				-	-	6.9	-	-	-	4.13	-	-
Critical Hdwy Stg 1				-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2				-	-	-	-	-	-	-	-	-
Follow-up Hdwy				-	-	3.3	-	-	-	2.219	-	-
Pot Cap-1 Maneuver				0	0	721	0	-	-	1011	-	0
Stage 1				0	0	-	0	-	-	-	-	0
Stage 2				0	0	-	0	-	-	-	-	0
Platoon blocked, %								-	-		-	
Mov Cap-1 Maneuver				-	0	718	-	-	-	1008	-	-
Mov Cap-2 Maneuver				-	0	-	-	-	-	-	-	-
Stage 1				-	0	-	-	-	-	-	-	-
Stage 2				-	0	-	-	-	-	-	-	-
Approach				WB		NB		SB				
HCM Control Delay, s				10.6		0		0.6				
HCM LOS				B								
Minor Lane/Major Mvmt		NBT	NBR	WBLn1	SBL	SBT						
Capacity (veh/h)		-	-	718	1008	-						
HCM Lane V/C Ratio		-	-	0.099	0.049	-						
HCM Control Delay (s)		-	-	10.6	8.8	-						
HCM Lane LOS		-	-	B	A	-						
HCM 95th %tile Q(veh)		-	-	0.3	0.2	-						

Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	91	0	0	463	314	261
Future Vol, veh/h	91	0	0	463	314	261
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	0	0	0	0
Mvmt Flow	91	0	0	463	314	261
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	908	445	575	0	-	0
Stage 1	445	-	-	-	-	-
Stage 2	463	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	308	617	1008	-	-	-
Stage 1	650	-	-	-	-	-
Stage 2	638	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	308	617	1008	-	-	-
Mov Cap-2 Maneuver	308	-	-	-	-	-
Stage 1	650	-	-	-	-	-
Stage 2	638	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	21.5	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1008	-	308	-	-	
HCM Lane V/C Ratio	-	-	0.295	-	-	
HCM Control Delay (s)	0	-	21.5	-	-	
HCM Lane LOS	A	-	C	-	-	
HCM 95th %tile Q(veh)	0	-	1.2	-	-	

Intersection						
Int Delay, s/veh	8.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	418	5	2	25	18	269
Future Vol, veh/h	418	5	2	25	18	269
Conflicting Peds, #/hr	0	1	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	0	0	0	0
Mvmt Flow	418	5	2	25	18	269
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	182	154	287	0	-	0
Stage 1	153	-	-	-	-	-
Stage 2	29	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	812	897	1287	-	-	-
Stage 1	880	-	-	-	-	-
Stage 2	999	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	810	896	1287	-	-	-
Mov Cap-2 Maneuver	810	-	-	-	-	-
Stage 1	878	-	-	-	-	-
Stage 2	999	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.2	0.6		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1287	-	811	-	-	
HCM Lane V/C Ratio	0.002	-	0.522	-	-	
HCM Control Delay (s)	7.8	0	14.2	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	3.1	-	-	

Queues
1: Highway 417 SB Ramp & Innes

Gloucester Costco Business Centre Gas Bar Addition

2032 Total Saturday Midday Peak Hour



Lane Group	EBT	EBR	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	1030	147	1041	612	880	268
v/c Ratio	0.50	0.15	0.51	0.53	0.93	0.18
Control Delay	12.8	1.9	12.9	2.6	51.6	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.8	1.9	12.9	2.6	51.6	0.3
Queue Length 50th (m)	57.0	0.0	58.0	0.0	84.5	0.0
Queue Length 95th (m)	72.6	7.3	73.7	13.0	#119.4	0.0
Internal Link Dist (m)	248.5		391.3			
Turn Bay Length (m)		45.0		100.0	75.0	75.0
Base Capacity (vph)	2061	972	2061	1160	969	1502
Starvation Cap Reductn	0	0	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	0.50	0.15	0.51	0.53	0.91	0.18

Intersection Summary

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

1: Highway 417 SB Ramp & Innes

2032 Total Saturday Midday Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗				↖↖		↗
Traffic Volume (veh/h)	0	1030	147	0	1041	612	0	0	0	880	0	268
Future Volume (veh/h)	0	1030	147	0	1041	612	0	0	0	880	0	268
Initial Q (Qb), veh	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
Parking Bus, Adj	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	
Adj Sat Flow, veh/h/ln	0	1800	1786	0	1800	1786				1800	0	1758
Adj Flow Rate, veh/h	0	1030	0	0	1041	0				880	0	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Percent Heavy Veh, %	0	0	1	0	0	1				0	0	3
Cap, veh/h	0	2034		0	2034					945	0	
Arrive On Green	0.00	0.59	0.00	0.00	0.59	0.00				0.28	0.00	0.00
Sat Flow, veh/h	0	3510	1514	0	3510	1514				3326	0	1490
Grp Volume(v), veh/h	0	1030	0	0	1041	0				880	0	0
Grp Sat Flow(s),veh/h/ln	0	1710	1514	0	1710	1514				1663	0	1490
Q Serve(g_s), s	0.0	17.5	0.0	0.0	17.7	0.0				25.8	0.0	0.0
Cycle Q Clear(g_c), s	0.0	17.5	0.0	0.0	17.7	0.0				25.8	0.0	0.0
Prop In Lane	0.00		1.00	0.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	2034		0	2034					945	0	
V/C Ratio(X)	0.00	0.51		0.00	0.51					0.93	0.00	
Avail Cap(c_a), veh/h	0	2034		0	2034					961	0	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	0.00	0.00	1.00	0.00				1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	11.7	0.0	0.0	11.8	0.0				34.8	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.9	0.0	0.0	0.9	0.0				15.0	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
%ile BackOfQ(50%),veh/ln	0.0	7.4	0.0	0.0	7.5	0.0				12.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	12.6	0.0	0.0	12.7	0.0				49.9	0.0	0.0
LnGrp LOS	A	B		A	B					D	A	
Approach Vol, veh/h		1030			1041						880	
Approach Delay, s/veh		12.6			12.7						49.9	
Approach LOS		B			B						D	
Timer - Assigned Phs		2			6			8				
Phs Duration (G+Y+Rc), s		65.5			65.5			34.5				
Change Period (Y+Rc), s		* 6			* 6			6.1				
Max Green Setting (Gmax), s		* 59			* 59			28.9				
Max Q Clear Time (g_c+I1), s		19.5			19.7			27.8				
Green Ext Time (p_c), s		23.3			23.4			0.7				
Intersection Summary												
HCM 6th Ctrl Delay			23.8									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.												

Queues
2: Highway 417 NB Ramp & Innes

Gloucester Costco Business Centre Gas Bar Addition
2032 Total Saturday Midday Peak Hour

	→	↘	←	↖	↙	↗
Lane Group	EBT	EBR	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	1664	246	1482	1084	171	586
v/c Ratio	0.61	0.19	0.54	0.75	0.52	0.38
Control Delay	6.0	0.8	3.1	18.0	52.2	0.7
Queue Delay	0.0	0.0	0.2	2.3	0.0	0.0
Total Delay	6.0	0.8	3.3	20.3	52.2	0.7
Queue Length 50th (m)	60.3	0.0	12.9	112.1	18.2	0.0
Queue Length 95th (m)	87.7	5.0	m6.4	m71.7	28.1	0.0
Internal Link Dist (m)	391.3		192.3			
Turn Bay Length (m)				180.0	100.0	75.0
Base Capacity (vph)	2739	1276	2739	1450	723	1547
Starvation Cap Reductn	0	0	376	234	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.19	0.63	0.89	0.24	0.38

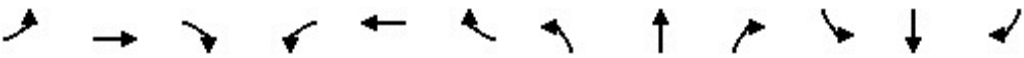
Intersection Summary

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

2: Highway 417 NB Ramp & Innes

2032 Total Saturday Midday Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↗		↑↑	↗	↖↖		↗			
Traffic Volume (veh/h)	0	1664	246	0	1482	1084	171	0	586	0	0	0
Future Volume (veh/h)	0	1664	246	0	1482	1084	171	0	586	0	0	0
Initial Q (Qb), veh	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			
Parking Bus, Adj	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				
Adj Sat Flow, veh/h/ln	0	1800	1800	0	1800	1800	1772	0	1800			
Adj Flow Rate, veh/h	0	1664	0	0	1482	0	171	0	0			
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Percent Heavy Veh, %	0	0	0	0	0	0	2	0	0			
Cap, veh/h	0	2793		0	2793		249	0				
Arrive On Green	0.00	0.82	0.00	0.00	1.00	0.00	0.08	0.00	0.00			
Sat Flow, veh/h	0	3510	1525	0	3510	1525	3274	0	1525			
Grp Volume(v), veh/h	0	1664	0	0	1482	0	171	0	0			
Grp Sat Flow(s),veh/h/ln	0	1710	1525	0	1710	1525	1637	0	1525			
Q Serve(g_s), s	0.0	19.1	0.0	0.0	0.0	0.0	5.6	0.0	0.0			
Cycle Q Clear(g_c), s	0.0	19.1	0.0	0.0	0.0	0.0	5.6	0.0	0.0			
Prop In Lane	0.00		1.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	0	2793		0	2793		249	0				
V/C Ratio(X)	0.00	0.60		0.00	0.53		0.69	0.00				
Avail Cap(c_a), veh/h	0	2793		0	2793		720	0				
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00			
Upstream Filter(I)	0.00	1.00	0.00	0.00	0.09	0.00	1.00	0.00	0.00			
Uniform Delay (d), s/veh	0.0	3.6	0.0	0.0	0.0	0.0	49.5	0.0	0.0			
Incr Delay (d2), s/veh	0.0	0.9	0.0	0.0	0.1	0.0	3.3	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			
%ile BackOfQ(50%),veh/ln	0.0	6.9	0.0	0.0	0.0	0.0	2.5	0.0	0.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	4.5	0.0	0.0	0.1	0.0	52.9	0.0	0.0			
LnGrp LOS	A	A		A	A		D	A				
Approach Vol, veh/h		1664			1482			171				
Approach Delay, s/veh		4.5			0.1			52.9				
Approach LOS		A			A			D				
Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		95.8		14.2		95.8						
Change Period (Y+Rc), s		* 6		* 5.8		* 6						
Max Green Setting (Gmax), s		* 74		* 24		* 74						
Max Q Clear Time (g_c+l1), s		21.1		7.6		2.0						
Green Ext Time (p_c), s		45.1		0.8		52.0						
Intersection Summary												
HCM 6th Ctrl Delay			5.0									
HCM 6th LOS			A									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR, EBR, WBR] is excluded from calculations of the approach delay and intersection delay.												

Queues
3: Innes Crossing & Innes

Gloucester Costco Business Centre Gas Bar Addition

2032 Total Saturday Midday Peak Hour



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	240	1968	26	2257	142	77	124	10	271
v/c Ratio	1.34	0.89	0.23	1.26	0.23	0.14	0.27	0.02	0.39
Control Delay	224.1	32.0	55.5	135.4	2.6	16.4	27.4	23.3	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	224.1	32.0	55.5	135.4	2.6	16.4	27.4	23.3	6.3
Queue Length 50th (m)	~66.1	151.4	5.3	~229.9	2.4	6.7	18.8	1.4	3.8
Queue Length 95th (m)	#114.9	#199.0	m4.5	m42.0	m1.6	16.9	33.7	5.1	21.4
Internal Link Dist (m)		192.3		193.0		122.5		129.2	
Turn Bay Length (m)	50.0		45.0		90.0		45.0		45.0
Base Capacity (vph)	179	2199	179	1788	616	558	455	645	698
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	1.34	0.89	0.15	1.26	0.23	0.14	0.27	0.02	0.39

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

3: Innes Crossing & Innes

2032 Total Saturday Midday Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			 			 	
Traffic Volume (veh/h)	240	1957	11	26	2257	142	34	13	30	124	10	271
Future Volume (veh/h)	240	1957	11	26	2257	142	34	13	30	124	10	271
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	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	240	1957	11	26	2257	142	34	13	30	124	10	271
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	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	178	2212	12	43	1769	547	243	99	188	566	638	539
Arrive On Green	0.21	0.88	0.88	0.03	0.48	0.48	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	1714	5042	28	1714	4914	1519	553	278	531	1382	1800	1522
Grp Volume(v), veh/h	240	1271	697	26	2257	142	77	0	0	124	10	271
Grp Sat Flow(s),veh/h/ln	1714	1638	1795	1714	1638	1519	1362	0	0	1382	1800	1522
Q Serve(g_s), s	11.4	23.4	23.4	1.6	39.6	6.1	1.1	0.0	0.0	2.4	0.4	15.4
Cycle Q Clear(g_c), s	11.4	23.4	23.4	1.6	39.6	6.1	3.6	0.0	0.0	6.0	0.4	15.4
Prop In Lane	1.00		0.02	1.00		1.00	0.44		0.39	1.00		1.00
Lane Grp Cap(c), veh/h	178	1437	787	43	1769	547	530	0	0	566	638	539
V/C Ratio(X)	1.35	0.88	0.88	0.61	1.28	0.26	0.15	0.00	0.00	0.22	0.02	0.50
Avail Cap(c_a), veh/h	178	1437	787	178	1769	547	530	0	0	566	638	539
HCM Platoon Ratio	2.00	2.00	2.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.82	0.82	0.82	0.09	0.09	0.09	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.6	5.2	5.2	52.6	28.7	19.9	24.0	0.0	0.0	24.8	23.0	27.9
Incr Delay (d2), s/veh	185.2	6.9	11.7	1.3	124.5	0.1	0.6	0.0	0.0	0.9	0.0	3.3
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	13.9	3.8	5.2	0.8	36.1	2.3	1.6	0.0	0.0	2.6	0.2	6.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	228.8	12.2	17.0	53.9	153.2	20.0	24.6	0.0	0.0	25.6	23.1	31.2
LnGrp LOS	F	B	B	D	F	C	C	A	A	C	C	C
Approach Vol, veh/h		2208			2425			77			405	
Approach Delay, s/veh		37.2			144.4			24.6			29.3	
Approach LOS		D			F			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.3	54.7		46.0	18.0	46.0		46.0				
Change Period (Y+Rc), s	* 6.6	6.4		7.0	* 6.6	6.4		7.0				
Max Green Setting (Gmax), s	* 11	39.6		39.0	* 11	39.6		39.0				
Max Q Clear Time (g_c+I1), s	3.6	25.4		5.6	13.4	41.6		17.4				
Green Ext Time (p_c), s	0.0	13.7		1.2	0.0	0.0		2.5				

Intersection Summary

HCM 6th Ctrl Delay	87.2
HCM 6th LOS	F

Notes

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

Queues
4: Cryville & Innes

Gloucester Costco Business Centre Gas Bar Addition

2032 Total Saturday Midday Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	113	1413	535	227	1672	283	520	96	230	251	84	186
v/c Ratio	0.62	1.20	0.70	1.07	1.32	0.56	1.64	0.17	0.37	0.80	0.15	0.31
Control Delay	68.6	134.5	17.3	130.8	178.4	11.8	334.8	28.7	5.5	68.5	28.5	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.6	134.5	17.3	130.8	178.4	11.8	334.8	28.7	5.5	68.5	28.5	5.6
Queue Length 50th (m)	26.2	~130.5	46.6	~51.3	~175.1	12.3	~83.4	15.0	0.0	27.6	13.0	0.0
Queue Length 95th (m)	m30.2	m#157.2	m64.1	#104.2	#204.1	24.4	#116.1	27.5	16.9	#46.8	24.7	15.3
Internal Link Dist (m)		193.0			155.0			42.3			210.4	
Turn Bay Length (m)	70.0		85.0	45.0		60.0	55.0		45.0	90.0		100.0
Base Capacity (vph)	213	1174	761	213	1267	509	317	564	623	313	558	596
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	1.20	0.70	1.07	1.32	0.56	1.64	0.17	0.37	0.80	0.15	0.31

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

4: Cryville & Innes

2032 Total Saturday Midday Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  		 			 		
Traffic Volume (veh/h)	113	1413	535	227	1672	283	520	96	230	251	84	186
Future Volume (veh/h)	113	1413	535	227	1672	283	520	96	230	251	84	186
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		0.99	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	1800	1800	1800	1800	1800	1786	1800	1800	1786	1786	1786	1786
Adj Flow Rate, veh/h	113	1413	0	227	1672	0	520	96	230	251	84	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	0	0	0	0	1	0	0	1	1	1	1
Cap, veh/h	141	1161		212	1366		314	558	465	312	554	
Arrive On Green	0.06	0.16	0.00	0.16	0.37	0.00	0.09	0.31	0.31	0.09	0.31	0.00
Sat Flow, veh/h	1714	4914	1525	1714	4914	1514	3326	1800	1500	3300	1786	1514
Grp Volume(v), veh/h	113	1413	0	227	1672	0	520	96	230	251	84	0
Grp Sat Flow(s),veh/h/ln	1714	1638	1525	1714	1638	1514	1663	1800	1500	1650	1786	1514
Q Serve(g_s), s	7.2	26.0	0.0	13.6	30.6	0.0	10.4	4.3	9.7	8.2	3.7	0.0
Cycle Q Clear(g_c), s	7.2	26.0	0.0	13.6	30.6	0.0	10.4	4.3	9.7	8.2	3.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	141	1161		212	1366		314	558	465	312	554	
V/C Ratio(X)	0.80	1.22		1.07	1.22		1.65	0.17	0.49	0.80	0.15	
Avail Cap(c_a), veh/h	212	1161		212	1366		314	558	465	312	554	
HCM Platoon Ratio	0.67	0.67	0.67	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.40	0.40	0.00	0.73	0.73	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	51.1	46.3	0.0	46.0	34.7	0.0	49.8	27.7	15.5	48.8	27.5	0.0
Incr Delay (d2), s/veh	5.3	100.8	0.0	72.9	106.0	0.0	308.0	0.7	3.7	14.2	0.6	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	3.5	22.2	0.0	10.2	25.8	0.0	18.1	2.1	4.2	4.2	1.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.4	147.1	0.0	118.9	140.7	0.0	357.8	28.3	19.2	63.0	28.1	0.0
LnGrp LOS	E	F		F	F		F	C	B	E	C	
Approach Vol, veh/h		1526			1899			846			335	
Approach Delay, s/veh		140.4			138.1			228.4			54.2	
Approach LOS		F			F			F			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	19.8	32.2	17.0	41.0	15.2	36.8	17.0	41.0				
Change Period (Y+Rc), s	* 6.2	* 6.2	* 6.6	6.9	* 6.2	* 6.2	* 6.6	6.9				
Max Green Setting (Gmax), s	* 14	* 26	* 10	34.1	* 14	* 26	* 10	34.1				
Max Q Clear Time (g_c+I1), s	15.6	28.0	10.2	11.7	9.2	32.6	12.4	5.7				
Green Ext Time (p_c), s	0.0	0.0	0.0	2.8	0.2	0.0	0.0	1.1				

Intersection Summary

HCM 6th Ctrl Delay	149.3
HCM 6th LOS	F

Notes

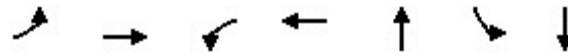
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

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

Queues
5: Stonehenge Crescent & Innes

Gloucester Costco Business Centre Gas Bar Addition

2032 Total Saturday Midday Peak Hour



Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	65	1798	74	2115	97	28	77
v/c Ratio	0.44	0.54	0.47	0.63	0.57	0.26	0.40
Control Delay	54.8	4.0	56.6	12.8	34.8	51.9	17.5
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	54.8	4.1	56.6	12.8	34.8	51.9	17.5
Queue Length 50th (m)	15.0	17.9	15.3	90.1	7.9	5.8	0.6
Queue Length 95th (m)	m14.5	m26.8	29.0	134.4	23.4	14.1	14.0
Internal Link Dist (m)		155.0		158.8	65.7		136.4
Turn Bay Length (m)	40.0		45.0			25.0	
Base Capacity (vph)	160	3327	167	3347	496	418	544
Starvation Cap Reductn	0	399	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.61	0.44	0.63	0.20	0.07	0.14

Intersection Summary

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

HCM 6th Signalized Intersection Summary Gloucester Costco Business Centre Gas Bar Addition

5: Stonehenge Crescent & Innes

2032 Total Saturday Midday Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	1787	11	74	2100	15	33	5	59	28	3	74
Future Volume (veh/h)	65	1787	11	74	2100	15	33	5	59	28	3	74
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	0.99		0.99	0.99		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	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adj Flow Rate, veh/h	65	1787	11	74	2100	15	33	5	59	28	3	74
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	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	83	3190	20	94	3219	23	87	28	110	221	8	194
Arrive On Green	0.06	0.84	0.84	0.05	0.64	0.64	0.13	0.13	0.13	0.13	0.13	0.13
Sat Flow, veh/h	1714	5039	31	1714	5033	36	323	208	824	1349	59	1459
Grp Volume(v), veh/h	65	1162	636	74	1366	749	97	0	0	28	0	77
Grp Sat Flow(s),veh/h/ln	1714	1638	1794	1714	1638	1793	1355	0	0	1349	0	1518
Q Serve(g_s), s	4.1	11.7	11.7	4.7	28.4	28.4	2.8	0.0	0.0	0.0	0.0	5.1
Cycle Q Clear(g_c), s	4.1	11.7	11.7	4.7	28.4	28.4	7.9	0.0	0.0	2.7	0.0	5.1
Prop In Lane	1.00		0.02	1.00		0.02	0.34		0.61	1.00		0.96
Lane Grp Cap(c), veh/h	83	2074	1136	94	2095	1147	224	0	0	221	0	202
V/C Ratio(X)	0.79	0.56	0.56	0.79	0.65	0.65	0.43	0.00	0.00	0.13	0.00	0.38
Avail Cap(c_a), veh/h	137	2074	1136	137	2095	1147	500	0	0	477	0	490
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)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	50.9	4.1	4.1	51.4	12.3	12.3	44.5	0.0	0.0	42.5	0.0	43.5
Incr Delay (d2), s/veh	1.5	0.1	0.2	16.8	1.6	2.9	1.3	0.0	0.0	0.3	0.0	1.2
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	1.9	3.1	3.4	2.6	11.6	13.1	2.7	0.0	0.0	0.8	0.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.4	4.2	4.3	68.1	13.9	15.2	45.9	0.0	0.0	42.8	0.0	44.7
LnGrp LOS	D	A	A	E	B	B	D	A	A	D	A	D
Approach Vol, veh/h	1863				2189				97		105	
Approach Delay, s/veh	5.9				16.1				45.9		44.2	
Approach LOS	A				B				D		D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.2	75.6		22.1	11.5	76.3		22.1				
Change Period (Y+Rc), s	* 6.2	6.0		7.5	* 6.2	6.0		7.5				
Max Green Setting (Gmax), s	* 8.8	46.0		35.5	* 8.8	46.0		35.5				
Max Q Clear Time (g_c+I1), s	6.7	13.7		9.9	6.1	30.4		7.1				
Green Ext Time (p_c), s	0.0	29.3		1.3	0.0	15.2		1.3				

Intersection Summary

HCM 6th Ctrl Delay	13.0
HCM 6th LOS	B

Notes

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

Intersection													
Int Delay, s/veh	0.8												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Vol, veh/h	0	0	0	1	0	102	0	744	20	16	830	0	
Future Vol, veh/h	0	0	0	1	0	102	0	744	20	16	830	0	
Conflicting Peds, #/hr	0	0	2	2	0	0	0	0	1	1	0	0	
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free	
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-	
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	0	0	0	0	0	0	0	0	0	0	
Mvmt Flow	0	0	0	1	0	102	0	744	20	16	830	0	
Major/Minor				Minor1		Major1			Major2				
Conflicting Flow All				1619		-	383	-	0	0	765	0	0
Stage 1				755		-	-	-	-	-	-	-	-
Stage 2				864		-	-	-	-	-	-	-	-
Critical Hdwy				6.6		-	6.9	-	-	-	4.1	-	-
Critical Hdwy Stg 1				5.8		-	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.4		-	-	-	-	-	-	-	-
Follow-up Hdwy				3.5		-	3.3	-	-	-	2.2	-	-
Pot Cap-1 Maneuver				105		0	621	0	-	-	857	-	0
Stage 1				430		0	-	0	-	-	-	-	0
Stage 2				416		0	-	0	-	-	-	-	0
Platoon blocked, %									-	-		-	
Mov Cap-1 Maneuver				101		0	620	-	-	-	856	-	-
Mov Cap-2 Maneuver				101		0	-	-	-	-	-	-	-
Stage 1				430		0	-	-	-	-	-	-	-
Stage 2				401		0	-	-	-	-	-	-	-
Approach				WB		NB			SB				
HCM Control Delay, s				11.9		0			0.2				
HCM LOS				B									
Minor Lane/Major Mvmt		NBT	NBRWBLn1	SBL	SBT								
Capacity (veh/h)		-	-	620	856	-							
HCM Lane V/C Ratio		-	-	0.165	0.019	-							
HCM Control Delay (s)		-	-	11.9	9.3	-							
HCM Lane LOS		-	-	B	A	-							
HCM 95th %tile Q(veh)		-	-	0.6	0.1	-							

Intersection						
Int Delay, s/veh	2.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	93	0	0	681	466	313
Future Vol, veh/h	93	0	0	681	466	313
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	0	0	0	0
Mvmt Flow	93	0	0	681	466	313
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1304	623	779	0	-	0
Stage 1	623	-	-	-	-	-
Stage 2	681	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	179	490	847	-	-	-
Stage 1	539	-	-	-	-	-
Stage 2	506	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	179	490	847	-	-	-
Mov Cap-2 Maneuver	179	-	-	-	-	-
Stage 1	539	-	-	-	-	-
Stage 2	506	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	45	0		0		
HCM LOS	E					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	847	-	179	-	-	
HCM Lane V/C Ratio	-	-	0.52	-	-	
HCM Control Delay (s)	0	-	45	-	-	
HCM Lane LOS	A	-	E	-	-	
HCM 95th %tile Q(veh)	0	-	2.6	-	-	

Intersection						
Int Delay, s/veh	13.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	590	0	1	9	24	368
Future Vol, veh/h	590	0	1	9	24	368
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	0	0	0	0
Mvmt Flow	590	0	1	9	24	368
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	219	208	392	0	-	0
Stage 1	208	-	-	-	-	-
Stage 2	11	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	774	837	1178	-	-	-
Stage 1	832	-	-	-	-	-
Stage 2	1017	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	773	837	1178	-	-	-
Mov Cap-2 Maneuver	773	-	-	-	-	-
Stage 1	831	-	-	-	-	-
Stage 2	1017	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	23	0.8		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1178	-	773	-	-	
HCM Lane V/C Ratio	0.001	-	0.763	-	-	
HCM Control Delay (s)	8.1	0	23	-	-	
HCM Lane LOS	A	A	C	-	-	
HCM 95th %tile Q(veh)	0	-	7.3	-	-	