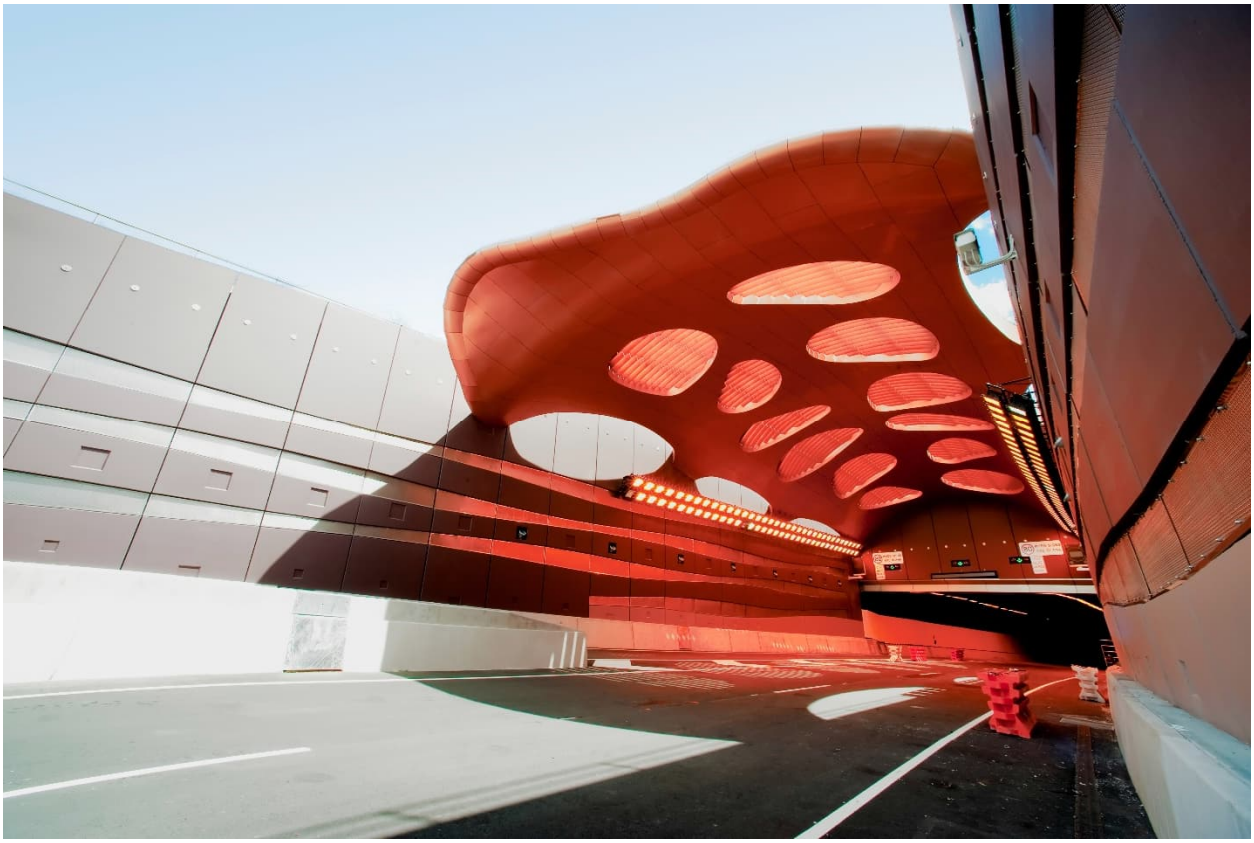
TOWN OF MILTON

TRANSPORTATION MASTER PLAN FOR THE BRITANNIA SECONDARY PLAN



TRANSPORTATION MASTER PLAN FOR THE BRITANNIA SECONDARY PLAN

TOWN OF MILTON

PROJECT NO.: 20M-01319-00
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Executive Summary

Introduction

WSP is part of a consulting team retained by the Town of Milton to prepare the Britannia Secondary Plan. The purpose of the Secondary Plan process is to undertake the necessary studies and background analysis to support Official Plan Amendments for the Britannia Secondary Plan Area, in conformity with Halton Region and Town of Milton Official Plan policies. A Secondary Plan is intended to establish a detailed planning and policy framework for a specific area to guide future development that will ultimately create complete communities.

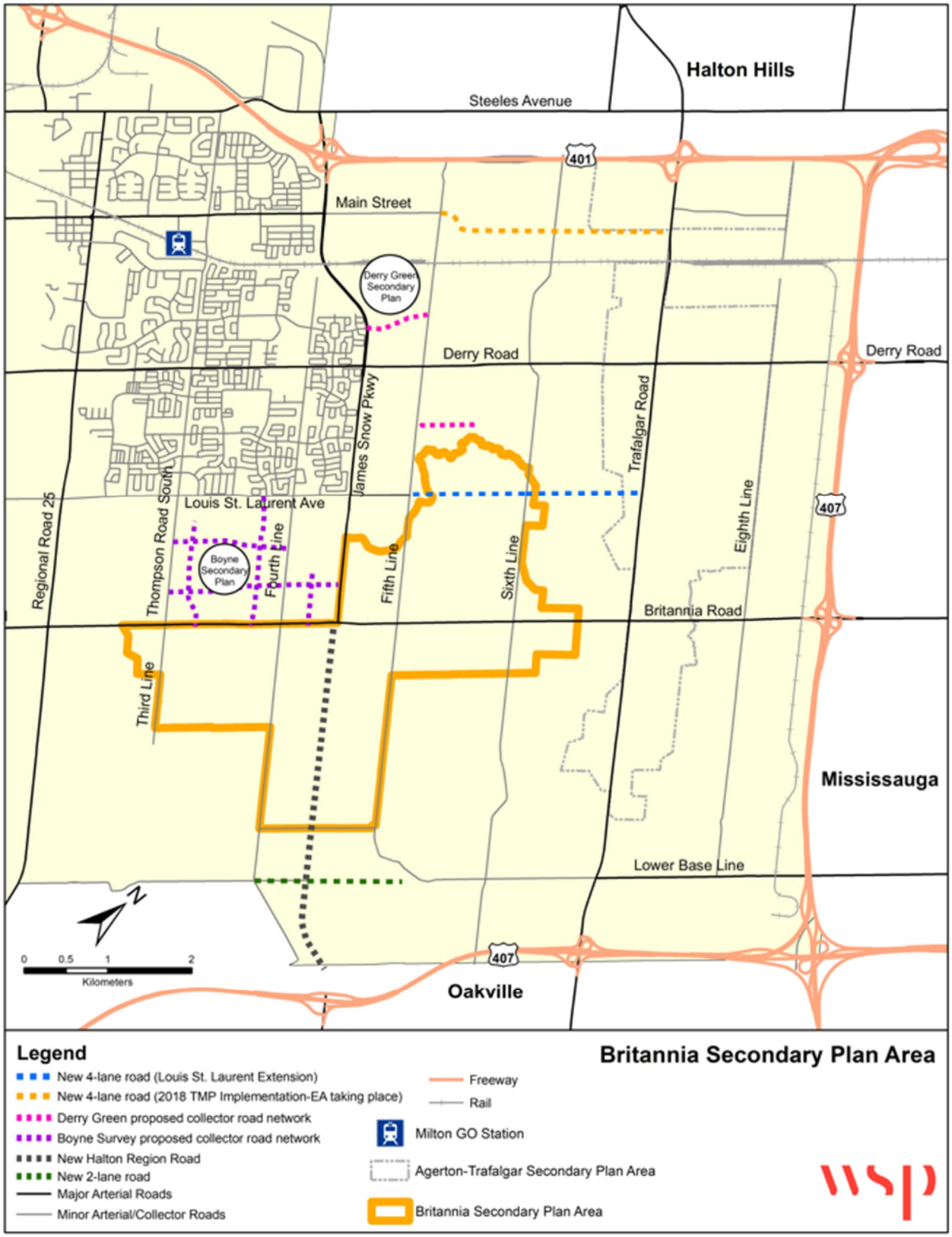
WSP's specific role in the Britannia Secondary Plan process is to create a transportation master plan (TMP) for this area per the *Municipal Class Environmental Assessment* process to reserve appropriate rights-of-way for the future road network to accommodate the planned development. The transportation planning work entails a multimodal analysis to ensure viable transportation options for pedestrians, cyclists, transit riders, automobiles, and goods movement.

An initial Transportation Master Plan was prepared for the Britannia Secondary Plan Area in 2022. Since that time, the population and employment forecasts have risen, and the horizon year has shifted from 2031 to 2051. This new TMP has been prepared to reflect the higher forecasts and the new horizon year.

The Britannia Secondary Plan Area (BSPA) is located on largely agricultural and rural lands in the southern portion of Milton, approximately 6.5 km south and east of Milton's historic town centre and is west of the Trafalgar Corridor Secondary Plan Area and southeast of the Boyne Survey Secondary Plan Area. Major roadways that bound and intersect the BSPA are Britannia Road, Thompson Road South, Third Line, Fourth Line, James Snow Parkway, Fifth Line, and Sixth Line.

The BSPA is reflected in **Figure 0.1**.

Figure 0.1: Britannia Secondary Plan Area



Opportunity Statement

The transportation master plan has been prepared following the *Municipal Class Environmental Assessment* process (MCEA, October 2000, as amended) for master plans. This transportation master plan component of the Secondary Plan completes Phases 1 and 2 of the MCEA process.

The vision represents the Problem and Opportunity Statement and meets Phase 1 of the MCEA process. The vision statement for transportation within the BSPA identifies Milton's priorities and common goal to work towards.

> To provide a continuous network of multi-modal transportation connections to the Town and Region's transportation system, ensuring that it is accessible for all modes and users.

The vision statement integrates four key principles:

- Design a complete street network that would be supportive of all modes of travel.
- Provide viable transportation options and choices.
- Connect the rest of Milton and enable regional connectivity.
- Create a foundation for balanced investment in transportation.

Public Consultation

Public consultation is essential to the MCEA process. The Town of Milton held three Public Information Centres (PICs) to present project progress and receive comments and feedback. The first PIC was held virtually on March 11, 2021, due to the COVID-19 pandemic. Based on the comments received at PIC #1, three land use options were developed for the Secondary Plan Areas.

The second PIC was held on July 7, 2021, once again virtually using the Zoom platform due to the COVID-19 pandemic. The responses received from PIC #2 provided valuable insight on the key elements of the land use options that the public would like to see represented in the preferred land use plan for Britannia.

The third PIC was held at Milton Town Hall on Tuesday, July 30, 2024, to update the public on the new and higher population and employment forecasts being proposed and how this has changed the Secondary Plan. Transportation-related questions had themes regarding alternatives to automobile travel, congestion, and the timing of future transportation infrastructure improvements.

Policy Context

Provincial, regional, and local policies shape the secondary planning process. These existing policy directives were reviewed, with the following transportation network recommendations noted.

- The Region's TMP planned capital improvements include planned widenings of Britannia Road and James Snow Parkway, as well as two new roads: New North Regional Road and James Snow Parkway extension.
- The Region's TMP identifies Britannia Road, Trafalgar Road, and Regional Road 25 as transit priority corridors that will include vehicular travel lanes, high-occupancy vehicle (HOV) or reserved bus lanes, boulevards, and multi-use paths on both sides.
- The 2025 Milton TMP proposes an extension of Main Street East to Trafalgar Road. The new road will serve the proposed GO train station near Trafalgar Road and Derry Road as proposed in the Region's Official Plan.
- The 2025 Milton TMP proposes an extension of Louis St. Laurent Avenue to Trafalgar Road.
- There are proposed active transportation connections, including bike lanes and boulevard multi-use paths planned along Britannia Road, James Snow Parkway, Regional Road 25, and the future New North Regional Road as part of the Halton Region Transportation and Active Transportation Master Plans.
- The existing land space available can accommodate a comprehensive network of local and collector roads to provide connectivity within the future developed lands. Multiple road network alternatives can be conceptualized at this stage given the current level of development.

Existing Conditions

The road network in the BSPA is comprised of a series of major arterials, minor arterials, and collectors. Major arterial roads within the study area are Britannia Road (Regional Road 6), Regional Road 25, Trafalgar Road (Regional Road 3), and Derry Road (Regional Road 7) which are under the authority of the Region of Halton. The minor arterial roads within the BSPA are Thompson Road South, Fifth Line, and Sixth Line. The collector roads within the study area are Third Line, Fourth Line, and Lower Base Line. All minor arterial and collector roads are under Town of Milton authority.

Transit

Public transit services do not currently serve the BSPA directly. However, there are a number of routes nearby that serve as opportunities for future connections.

Active Transportation

Currently there are no dedicated sidewalks or cycling facilities located within BSPA, except for the multi-use path on Britannia Road.

Goods Movement

Goods movement (both rail and truck) is a significant driver of Milton's economy, providing the products and goods the Town's residents rely on. Britannia Road, James Snow Parkway, and Trafalgar Road are classified as regional major arterial roads and therefore experience substantial goods movement activity.

Travel Characteristics

The Transportation Tomorrow Survey (TTS) results show that the majority of trips out of Milton during the weekday a.m. peak period are eastwards toward Mississauga and Toronto, and southwards to Oakville and Burlington. The majority of trips into Milton during the weekday p.m. peak period reverse the a.m. trend when people travel home coming from the East and the South.

Traffic Operations

Most intersections in and around the BSPA currently operate without capacity constraints, with volume to capacity (v/c) ratios at or below 1.0 and with acceptable overall level of service (LOS) during both peak hours. The p.m. peak hour is more critical, evident through the operations of Trafalgar Road at Derry Road and Trafalgar Road at Lower Base Line. Both intersections are near or at capacity with several movements also near or at capacity. The intersection at Trafalgar Road at Britannia Road operates at a v/c above 0.85 in the a.m. peak hour.

Assessment of Alternative Solutions

Phase 2 of the MCEA process requires identifying alternative solutions to fulfill the vision and the objectives of the TMP. The alternative solutions for the BSPA include road, trail/multi-use path (MUP), and cycling networks based on the land area designations. A total of three alternative options were developed and analyzed. A summary of the three options is presented in **Table 0.1**. Feedback on these solutions was received from residents, landowners, and other stakeholders.

The preferred option was developed based on feedback received from stakeholders and Town staff reviewing alternative options and their key features. It was also modified based on changes in population forecasts. The process to determine which features to include in the transportation network in the preferred option involved identifying those features that best align with the Town's vision while providing high connectivity and accessibility for all modes of travel. The preferred land use plan is most similar to Alternative Option 2. Key features include:

- Evolving neighbourhoods are integrated, resulting in a mix of housing types throughout the neighbourhoods.
- Retail nodes are located within each neighbourhood as the primary focus of intensity and activity.
- A logical, well-connected road and active transportation system that balances connectivity with impacts to the Natural Heritage System (NHS) is provided.
- A full range of parks is planned, optimizing walking distance from most residents and providing for opportunities for co-location of schools and parks.

Table 0.1: Alternative Options

	Alternative Option 1: Nodes and Corridors	Alternative Option 2: 15-Minute Neighbourhood	Alternative Option 3: Integrated Blocks & Squares
Character and Identity	Transit-oriented with a focus on the Regional Corridors.	6 “15-minute neighbourhoods” focused on retail nodes. Regional Corridors varying in conditions and appearance.	22 “blocks” organized on a 5 minute walk to a square / neighbourhood focal point. Character varies as each square and block establish a unique form and function.
Housing	Medium Density residential concentrated along Regional Corridors. Low Density residential internal.	Medium Density residential is focused and internal to neighbourhood.	Residential density is integrated throughout each block and street. Encourages intermixing compatible residential unit types.
Retail	One large Major Retail Node at the Regional Corridor intersection, supported by Local Retail Nodes spaced at approximately 20-minute walk intervals along the Regional Corridors.	One smaller Major Retail Node at southwest corner of regional crossroads. More internal Local Retail Nodes to provide walkability.	Neighbourhood Focal Points permit small-scale retail and service commercial uses. Supported by more traditional retail nodes.
Parks	3 District Parks and 6 Neighbourhood Parks dispersed evenly. No squares.	2 District Parks and 8 Neighbourhood Parks. Squares used where access to parks is limited.	17 Squares, 4 Neighbourhood Parks and a central Community Park ensure access to green space for all residents within a 5 minute walk.
Schools	2 High Schools and 10 Elementary Schools adjacent to parks where possible.	2 High Schools and 10 Elementary Schools adjacent to parks where possible.	2 High Schools and 10 Elementary Schools adjacent to squares, where possible.
Places of Worship	3 new Places of Worship located along Regional Corridors.	3 new Places of Worship located near nodes.	3 new Places of Worship located within or near Neighbourhood Focal Points with arterial access.
Active Transportation	High reliance on off-road trails/MUPs, pathways, and linkages through the NHS to increase connectivity.	Combination of on- and off-road trails/MUPs and pathways. Heavy reliance on NHS linkages to continue grid network.	Primarily deployed on-street given high connectivity of the grid system.
Street Network	Curvilinear grid. Avoidance of NHS crossings. Low grid connectivity and intersection density. Primarily Major Collectors. Clear hierarchy of Collectors.	Modified grid network. Strategic NHS crossings. Medium grid connectivity and intersection density. Equal balance of collectors. Clear hierarchy of Collectors.	Strong grid. Numerous NHS crossings. High connectivity and intersection density. Greater use of minor collectors. Collector hierarchy is similar.

Preferred Road Network

The road network within the BSPA is designed to follow a modified grid pattern with Britannia Road and James Snow Parkway as the central spine roads. Thompson Road South, Third Line, Fourth Line, Fifth Line, Sixth Line, and new collector roads proposed parallel to James Snow Parkway, facilitate north-south traffic movements within the Secondary Plan Area. East-west traffic movements are facilitated by the Louis St. Laurent Avenue extension, new collector roads and Lower Base Line.

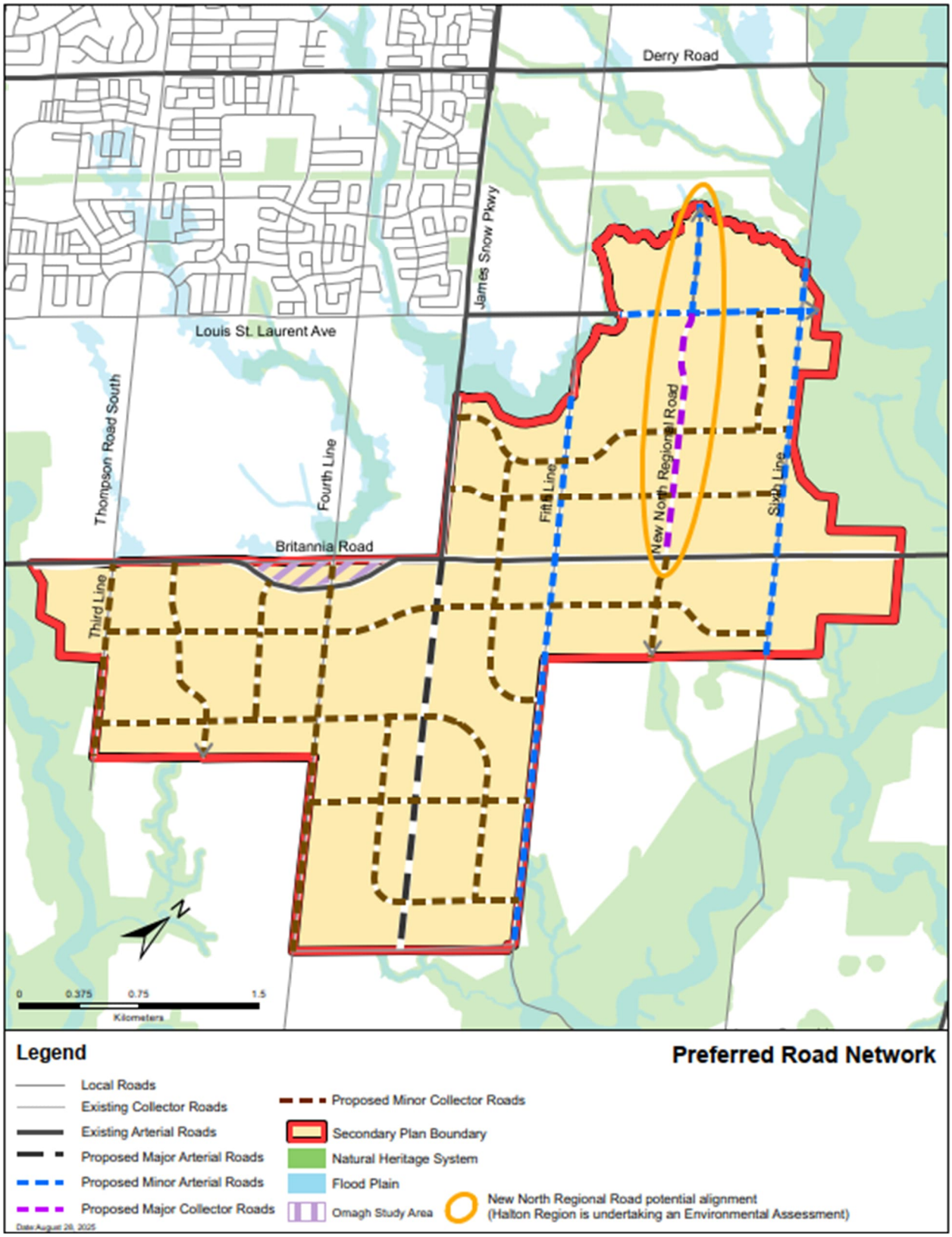
Regional roads, including Britannia Road and James Snow Parkway, are planned to be six lanes and are included in the Region's ongoing Integrated Master Plan. Walking and cycling facilities also are planned for both sides of the roads. A major retail/service node is planned at the intersection of Britannia Road and James Snow Parkway.

Several Town roads have also been proposed to be built, extended, and improved:

- Louis St. Laurent Avenue has been expanded to an urban four-lane cross-section and extended to Fifth Line. Louis St. Laurent Avenue is planned to be extended to Trafalgar Road given the horizon year of 2051.
- New North Regional Road is a new proposed 6-lane north-south arterial that is located between Fifth Line and Sixth Line and extends from Steeles Avenue to Britannia Road. Halton Region has commenced an Environmental Assessment for this road. The Region's EA will determine whether the Region will proceed with a Regional road along this corridor. This TMP finds that a road is needed in this corridor to collect traffic from the various neighbourhoods of local roads and distribute to the wider arterial road network. Without this connection, significant vehicle volumes would need to be redirected to James Snow Parkway, Fifth Line, and Sixth Line. As such, the Britannia Secondary Plan makes provisions for a road along this corridor should the Region not proceed with a Regional road. The Secondary Plan identifies this road as a collector road between Britannia Road and the extension of Louis St. Laurent and as a minor arterial road north of the Louis St. Laurent extension to the northern limit of the Secondary Plan.
- Other newly proposed collector roads will typically have one lane in each direction with additional lanes at intersections where high turning movements are expected.

The preferred road network is shown in **Figure 0.2**.

Figure 0.2: Preferred Road Network



Future Background Traffic Conditions

For the analysis of the future background traffic conditions (future traffic conditions without Britannia development traffic), this study considered the 2051 horizon year. Various Regional, Metrolinx, and Town planning and traffic studies were reviewed to determine the planned projects for the roadways and lands within the BSPA, including the ongoing Milton Transportation Master Plan. The following road network improvements were applied within the BSPA for the future analyses:

- **Britannia Road:** Britannia Road was widened to a total of six lanes, with four general purpose and two HOV/Transit lanes throughout the BSPA.
- **James Snow Parkway:** James Snow Parkway was widened to a total of six lanes, with four general purpose and two HOV/Transit lanes throughout the BSPA and a southerly extension from Britannia Road to Highway 407 and Neyagawa Boulevard in the Town of Oakville.
- **Louis St. Laurent Avenue:** Louis St. Laurent Avenue was extended from Fifth Line to Trafalgar Road and was assumed to have a total of four general purpose lanes.
- **New North Regional Road:** New North Regional Road is a potential new 6-lane (3 lanes per direction) major arterial road between Fifth Line and Sixth Line, with an interchange on Highway 401. Halton Region has commenced an Environmental Assessment for this road.
- **Trafalgar Road:** Trafalgar Road was widened to a total of six lanes, with four general purpose and two High Occupancy Vehicle (HOV)/Transit lanes.
- **Derry Road:** Derry Road was widened to a total of six lanes, with four general purpose and two HOV/Transit lanes.
- **Lower Base Line:** Lower Base Line was widened to a total of 4 lanes from Fifth Line to Milton's eastern boundary.

To determine future background traffic volumes, a subarea traffic assignment and distribution model ("subarea model") for the BSPA was developed using the Region's 2051 G4HT Activity Based Model (ABM) and based on inputs used in the ongoing Milton Transportation Master Plan. This ensured that all the above-noted infrastructure improvements and several other planned developments in the Milton area were included in the analysis. The subarea model for the future background scenario was developed by combining 2016 travel demand in the BSPA with 2051 travel demand in rest of Milton.

Traffic operations for the 2051 future background traffic conditions were assessed for the study intersections. Nine of the 10 analyzed intersections are expected to operate at or above a v/c ratio of 0.85 during both the a.m. and p.m. peak hour, even after assuming dual left turn lanes at major intersections (assumed lane configurations are shown in **Figure 5.2**). The only intersection that is not projected to exceed an overall v/c ratio of 0.85 is at Britannia Road and Thompson Road.

To account for work from home trips and a potential increase in transit and active transportation trips, a sensitivity analysis was conducted that assumed 15% lower car volumes than what was reported through the model results for future background traffic volumes. This analysis shows vastly improved conditions compared to the regular future background conditions analysis, with six of the 10 examined intersections operating at an overall v/c larger than 0.85 (and only one operating with an overall v/c larger than 1). This highlights the need to maintain / incent work

from home policies and promote the use of sustainable transportation modes across Milton to reduce overall car volumes.

Britannia Development Trips

The BSPA is expected to support approximately 57,500 people and 9,300 jobs. These estimates were converted into residential units and employees to generate future development-related traffic volumes. The development statistics used for the trip generation calculations are provided in **Table 0.2**.

Table 0.2: BSPA Development Statistics

Land Use	Units/Number	Population	Jobs
Evolving Neighbourhoods	**14,140**	**49,070**	**3,930**
Singles/Semis	6,830	26,980	2,160
Secondary Suites	680	1,230	100
Townhouses	4,950	15,580	1,250
B2B Townhouses	1,680	5,280	420
Mixed Use Areas	**3,340**	**8,610**	**4,050**
Neighbourhood Commercial Mixed Use	**1,100**	**2,530**	**2,050**
Commercial	-	-	1,840
Road ROW - NC MU	-	-	-
Medium Density Block - B2B	420	1,310	110
High Density Block - Stacked/Apts	680	1,220	100
Urban Village Centre	**2,240**	**6,080**	**2,000**
Commercial	-	-	1,510
Road ROW - Urban Village	-	-	-
Medium Density Block - B2B	360	1,150	90
High Density Block - Stacked/Apts	730	1,320	110
Townhouses	750	2,350	190
B2B Townhouses	400	1,260	100
Schools	**16**		**1,250**
Elementary School	13		650
Secondary School	3		600
Parks	**11**		**-**
District Park	4		-
Neighbourhood Park	5		-
Existing Parks	2		-
Places of Worship	**7**		**70**
Place of Worship	7		70

Trip generation for the BSPA was estimated using the rates outlined in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition. The trip generation estimates apply a non-auto modal split of 33 percent, extrapolating to 2051 the 2031 goal of 28 percent specified in the Region's 2011 TMP (five percent active transportation, 20 percent transit and three percent transportation demand management), and being cognizant of the rise

of work from home jobs (as of May 2024, approximately 22% of Ontarians work mostly from home).

The full build-out of the BSPA development is expected to generate a total of 7,810 two-way (2,756 inbound and 5,054 outbound) vehicle trips in the a.m. peak hour and 11,602 two-way (6,433 inbound and 5,169 outbound) vehicle trips in the p.m. peak hour. The detailed calculations for these trips are provided in **Table 5.5** in the main body of this report.

Trip distribution for the BSPA for the 2051 horizon year was estimated using the origin-destination matrices from the Region's ABM with the proposed residential and employment densities outlined in **Table 0.2**.

Future Total Traffic Conditions

Future total traffic conditions (future traffic conditions with the Britannia development and background traffic) were assessed for the 2051 horizon year. New study intersections were added to reflect the proposed BSPA roadway network.

The results of the intersection capacity and queueing analyses demonstrate that none of the analyzed intersections operate below an overall v/c ratio of 0.85. Mitigation measures on top of optimizing signal timing plans for splits and cycle lengths have been proposed and the recommended mitigation measures include:

- An additional northbound left and right turn lane at the Britannia Road and Thompson Road intersection.
- An additional northbound through lane and a northbound right turn lane at the Britannia Road and Fifth Line intersection.

Dual left turn lanes on the other intersections are already required in the total background conditions.

A similar sensitivity analysis was conducted as for the future background conditions, assuming that all background traffic was reduced by 15%. This again improves performance at all intersections, though many remain above capacity. This re-confirms the need for Town-wide initiatives that foster work from home and the use of sustainable modes to reduce overall background volumes across Milton. Infrastructure improvements to intersections will not be sufficient to solve challenges in both the future background and future total scenarios.

It is therefore recommended that:

- Town-wide efforts are undertaken to reduce overall vehicle volumes in Milton by investing in active transportation and transit and creating effective TDM policies that would incent work from home, transit, active transportation, and carpooling. The Town may also wish to consider land use changes that would bring job locations closer to homes, to reduce the number and length of car trips and thereby reduce pressures on the examined intersections. These improvements will be required as intersection infrastructure improvements alone were found to not be sufficient to improve intersection performance beyond the Region's critical thresholds.

- Transit and active transportation facilities, and appropriate transportation demand management measures, are in place in line with the rate of BSPA development to foster sustainable transportation choices.
- Right-of-way requirements for the dual left-turn lanes are protected now and the intersections are monitored regularly through the Region's Traffic Count Program and further considered in future MCEA studies to determine if the additional lanes are necessary.

Tertiary Plan Transportation Studies are conducted to refine the level of analysis and reassess the recommendations to confirm if additional transportation infrastructure is required to support the development in the area. The Tertiary Plan Roads Needs Assessment for the Britannia Secondary Plan Area should:

1. **Collect new traffic count data and reconfirm existing conditions**: Traffic patterns have "normalized" since the pandemic and new traffic count data should be collected and analyzed for study area intersections.
2. **Use Halton Region ABM to determine future background traffic**: Similar to the Britannia TMP, the Region's ABM should be used to extract future background traffic volumes on road links in the study area.
3. **Report the land uses**: The Britannia TMP used the Secondary Plan land uses to generate trips. The Tertiary Plan RNA should determine if there are any refinements or updates to the land uses and report the land uses being considered in the Tertiary Plan.
4. **Divide the Regional EMME Model Traffic Analysis Zones**: create sub zones that can reflect a more detailed trip generation and assignment method.
5. **Confirm the modal split for Britannia trips**: The modal split used in the Britannia TMP is an aspirational 33% for the ultimate build out of the full Secondary Plan Area, assumed to be in the year 2051. This aspirational goal incorporates expected future advances in transit, introduction of intra/inter-regional transit, expansion of Milton Transit, continued adoption of work from home several days a week, and other travel demand management measures.

   The RNA should identify and propose all reasonable measures that may be implemented in order to support a shift towards the modal split used in the Britannia TMP. This could include:
   - **Active transportation**: Wider sidewalks, wider cycling facilities, additional connections for active transportation; active transportation supports such as requirements for secure bike parking, locker room and shower facilities at businesses, and other items.
   - **Transit**: Additional buses to accommodate shorter headways and provide capacity for additional riders; transit priority measures such as queue jump lanes, dedicated transit lanes; additional facilities to service and store the additional buses; introduction of intra/inter-regional bus service; expansion of existing bus services; introduction of higher order transit such as Light Rail Transit (LRT); and any other measures.
   - **Road classifications**: Changes to road classification to accommodate more space for sustainable travel; modifications to existing road classifications to accommodate more space for more sustainable travel.

- **Travel demand management**: Any other measures.

The expected modal split that can be reasonably assumed for Britannia trips in the Tertiary Plan RNA must be documented and justified. The modal split for Britannia-generated trips should be confirmed with the Region and Town prior to further analysis.

6. **Present the distribution of trips**: The distribution of Britannia trips should be documented with a rationale given for how it was determined.
7. **Assign trips to the network**: Document the assignment of vehicle trips to the road network.
8. **Conduct the intersection analysis**: Analyze future conditions and provide conclusions and recommendations in the RNA report.
9. **Establish a coordinated Staging and Monitoring Plan**: Ensure that Regional roads, including James Snow Parkway and Britannia Road, function efficiently as major routes through the Secondary Plan area (results will need to conform to criteria established in the Region's Transportation Impact Study Guidelines) based on Planning horizons.
10. **As part of the Staging and Monitoring Plan, develop an Access Management Strategy**: Ensure interim and ultimate access during implementation is achieved through landowner coordination and in conformity with the Region's Access Management Guideline and By-law 32-17 and Secondary Plan.
11. **Determine lane configurations at intersections**: at Town minor arterial and collector road intersections and Town minor arterial and collector road intersections with Regional roads, recommend interim and ultimate intersection configurations (before and after Town and Regional road capital improvements), as part of the Staging and Monitoring Plan

As an outcome of the analysis, the Town requires that the Tertiary Plan RNA report:

- **Road classification and right-of-way**: The road classification, based on the classification presented in the Town's TMP, needs to be reconfirmed for all Town roads. The right-of-way, also based on the Town's TMP, needs to be stated for all Town roads. This is expected to be the ultimate right-of-way needed at full build out of the Britannia Secondary Plan Area.
    a. Indicate if road classifications need to be changed to accommodate more space for more sustainable modes of travel. Indicate if travel lanes need to be repurposed from general purpose lanes to other types of lanes or facilities for other sustainable travel modes.
- **Intersection controls and lane configurations**: The type of intersection control (stop, roundabout, signals, and so forth) needs to be confirmed and the lane configurations need to be documented. The lane configurations need to be able to fit within the right-of-way for the confirmed road classification.
- **Transit infrastructure to meet modal split**: The number of additional buses or other infrastructure needed to be able to accommodate passengers using transit.
    a. Indicate how public transit can be made more affordable and more convenient than the private automobile for travel for Britannia-related trips. Indicate what infrastructure and other measures are required to be able to achieve the mode split used for Britannia-related trips, from additional buses to the introduction of

higher order transit, dedicated transit lanes, and any other infrastructure and measures.

- **Transportation infrastructure requirements for walking, cycling, and vehicular travel:** Based on the road classification, the walking (sidewalks, multi-use paths), cycling (dedicated cycling facilities, multi-use paths), and vehicle requirements (number of lanes) need to be stated.
    a. Indicate any enhancements to the walking and cycling network that are required to achieve the mode split used for Britannia-related trips. Indicate if any other travel demand measures are needed to achieve the mode split for Britannia-related trips.

Active Transportation Network

The proposed active transportation network provides key north-south and east-west linkages through the BSPA, provides accessible routes that reach points of interests, and establishes routes that benefit future development areas. In addition, the proposed active transportation network is consistent with both the Region's and Town's guidelines.

Separated bicycle lanes or cycle tracks are proposed along all collector roads, as well as along James Snow Parkway, to provide connectivity from retail / service nodes to the residential areas within the BSPA. A separated bicycle lane is also proposed along Lower Base Line as a continuation of the already existing bike lane.

The proposed cycling facilities also serve as a connection to trails within the NHS and the proposed BSPA trails. The proposed BSPA trails are conceptual in nature to reflect "desire lines" and have been developed at a high level to increase connectivity within the BSPA. A detailed study to confirm the location of these trails has not been conducted at this time.

Transit

Milton Transit acts as an essential link between the Town and the existing Milton GO train station. Considering the population-employment forecast and future developments planned for BSPA, it is expected that Milton Transit will expand service and operate on arterial and collector roads within the BSPA. Transit service is also expected to be coordinated with operations at the Milton GO station to facilitate movement to and from this station to the BSPA.

Future planning studies within the BSPA should address the needs of the higher-order transit system and plan for transfer stations, parking structures, and an active transportation network. A trunk-feeder model transit operation is proposed, where the trunk routes would operate on Regional Road 25, Britannia Road, James Snow Parkway, and Trafalgar Road. Operational coordination between the trunk system and the feeder system operated by Milton Transit is essential to develop an efficient transit system within the BSPA. Future transit improvements within the BSPA will help reduce reliance on the car.

Goods Movement

Goods movement is an integral part of an economy. The Regional road nature of Britannia Road, James Snow Parkway, and Trafalgar Road make these roadways important goods

movement routes. The TMP recognizes that this goods movement function will remain as the BSPA develops and recommends implementing policies to support goods movement.

Road Safety

To enhance road safety and work towards reducing the number of fatalities and serious injuries on the transportation network, a safety strategy for the BSPA can be developed. The strategy should view road safety as a shared responsibility between road users and system designers from transportation planners, traffic engineers, land use planners, to policymakers, law enforcement, and emergency response teams. Rather than demanding road users to adapt perfectly to their surroundings, the strategy should focus on designing a road system that accounts for human error.

Transportation Demand Management

Transportation Demand Management (TDM) is an overarching concept that provides several policies, programs, services, and products that encourage people to choose more sustainable travel methods. A comprehensive TDM plan specific for the BSPA should be developed that incorporates the Town's and the Region's TDM plans. It is recommended that staff be designated to implement, monitor, and update the plan.

Implementation Plan

Phasing

It is recommended that the development takes place in two phases by initially developing neighborhoods east of Fourth Line. A phased approach will allow for re-assessment of traffic volumes to re-confirm appropriate transportation infrastructure. While this is the proposed phasing based on the ability of the Town to extend its infrastructure services to the study area, development is not required to follow this approach and may proceed in different locations sooner than others due to market demand, growth management plans, and other factors.

Agency Coordination

To best support the goal of the Secondary Plan and enhance overall regional connectivity, it is important that the Town continues to collaborate with neighbouring municipalities and agencies such as Halton Region, Metrolinx, MTO, and 407 ETR.

Monitoring Development

A long-term plan such as this Secondary Plan can be achieved successfully through tracking progress via performance indicators. Setting up a monitoring system allows the Town to keep track of the relevance of current transportation projects in relation to the Town's needs and identify any future opportunities.

Costing

A high-level cost estimation for the proposed road and trail network and transit system for the Britannia Secondary Plan is shown in **Table 0.3**. The total cost of the transportation network is estimated to be approximately $182.45 million for both phases of the BSPA, including proposed collector roads, proposed intersection improvements required because of traffic generated by the BSPA development, potential road crossings over waterways, the off-road trail network, potential trail crossings, and the proposed expansion of the municipal transit service.

The James Snow Parkway extension and Louis St. Laurent Avenue extension are already identified in existing plans and are therefore not included in the cost estimates. The ongoing widening and realignment of Britannia Road and the widening of James Snow Parkway are also not included in the cost estimates. As the Town has begun work on Fifth Line (Derry to Britannia), Sixth Line (Highway 401 to Britannia), and Louis St. Laurent Avenue (Fifth Line to Trafalgar), these segments have not been included in the cost estimates.

Halton Region is currently undertaking an Environmental Assessment for the New North Regional Road, which will determine whether the Region is building a Regional road along that corridor. The Britannia Secondary Plan makes provisions for a road along this corridor should the Region not proceed with a Regional road. The Secondary Plan identifies this road as a collector road between Britannia Road and the extension of Louis St. Laurent and as a minor arterial road north of the Louis St. Laurent extension to the northern limit of the Secondary Plan. Per the Town's Local Service Policy, a collector road would be direct developer responsibility. The Town would be responsible for any minor arterial portions of the road.

Separated cycling lanes, cycle tracks, and sidewalks all are included in the road construction costs as these facilities are located in the road right-of-way. The unit costs shown in **Table 0.3** exclude design/permit (15%) costs and contingency (20%) costs, as well as any project specific costs and land acquisitions, and are based on the unit cost estimation used in the 2025 TMP.

Table 0.3: Summary of Cost Estimates

Facility	Total Cost per Unit	Cost Unit	Phase 1 Length / Units	Total Cost	Phase 2 Length / Units	Total Cost
Minor Arterial- 4 lanes (including bridge structure) *	-	-	0.7	**$10,900,000**	0	**$0**
Major Collector - 4 lanes	$9,000,000	per centre line km	1.55	**$13,950,000**	0	**$0**
Collector Road - 2 lanes	$3,500,000	per centre line km	15.9	**$55,650,000**	6.2	**$21,700,000**
Road Crossing - 2 lanes	$2,400,000	each	10	**$24,000,000**	4	**$9,600,000**
Intersection Improvement	$175,000	each	4	**$700,000**	0	**$0**
Trail (lit)	$1,026,000	per linear km	8.06	**$8,269,560**	1.36	**$1,395,360**
Trail (unlit)	$667,000	per linear km	1.76	**$1,173,920**	1.36	**$907,120**
Trail Crossing	$286,000	each	0	**$0**	1	**$286,000**

Facility	Total Cost per Unit	Cost Unit	Phase 1 Length / Units	Total Cost	Phase 2 Length / Units	Total Cost
Transit Bus	$1,060,000	per vehicle	21	**$22,260,000**	11	**$11,660,000**
			Total	**$136,903,480**	**Total**	**$45,548,480**

* The cost of the 4-lanes minor arterial road for the New North Regional Road between Louis St. Laurent Avenue and the study area boundary is provided by Town's DC study team. The cost includes capital surcharge, PMR, design/CA etc.

Funding

Much of the transportation network proposed for the BSPA would be constructed by private developers through the development of the area's greenfield lands. Funding strategies for Town-related transportation costs could include opportunities at the federal, provincial, and regional levels, as well as various Town funding sources, including development charges.

Conclusion and Recommendations

This TMP report addresses the key principles for the BSPA through the following recommendations:

- **Design a complete street network that would be supportive of all modes of travel:** by creating a connected trail and active transportation network within the Natural Heritage System and along arterial and collector roads that connects to employment and residential areas.
- **Provide viable transportation options and choices:** by establishing an active transportation, trail, and road network to support walking, cycling, transit, driving and goods movement.
- **Connect the rest of Milton and enable regional connectivity:** by developing a north-south transit-oriented corridor along James Snow Parkway to connect to Milton's GO train station, as well as an east-west transit-oriented corridor on Britannia Road to connect to Trafalgar Road (Trafalgar Road is proposed to be a transit-oriented corridor that connects to a new GO train station in the Agerton Trafalgar Secondary Plan).
- **Create a foundation for balanced investment in transportation**: by integrating various modes of travel in the proposed infrastructure to shift from an auto-centric to a more balanced modal split.

Recommendations for the BSPA include:

- Undertake Town-wide efforts to reduce overall vehicle volumes in Milton by investing in active transportation and transit and creating effective TDM policies that would incent work from home, transit, active transportation, and carpooling. The Town may also wish to consider land use changes that would bring job locations closer to homes, to reduce the number and length of car trips and thereby reduce pressures on the examined intersections. These improvements will be required as intersection infrastructure improvements alone were found to not be sufficient to improve intersection performance beyond the Region's critical thresholds.

- Ensure transit and active transportation facilities, and appropriate transportation demand management measures, are in place in line with the rate of development to foster sustainable transportation choices.
- Protect right-of-way requirements for the proposed dual left-turn lanes now and monitor the intersections regularly to determine if the additional lanes are necessary.
- Conduct Tertiary Plan Transportation Studies to refine the level of analysis and reassess the recommendations to confirm if additional transportation infrastructure is required to support the development in the area.
- Establish a Town-wide road safety strategy that works towards reducing the number of fatalities and serious injuries on the transportation network.
- Establish a Britannia-specific TDM plan and dedicate staff to implement, monitor and update the plan.
- Establish a development hierarchy system starting from the neighbourhood node areas before developing residential areas moving from east to west.
- Collaborate with other transportation agencies and municipal transit authorities to provide regional connectivity.
- Set up a monitoring system which includes a benchmark for Milton in order to establish specific goals to reach for the BSPA using performance indicators and measures.
- Institute a parking system that will further promote transit ridership and carpooling and create a safe environment for active transportation.

1 Introduction and Study Background

1.1 What is a Secondary Plan?

A Secondary Plan establishes a detailed planning and policy framework for a specific study area to guide future development to ultimately create complete communities. As part of this Secondary Plan process, necessary studies and background analysis will be undertaken to support Official Plan Amendments for the Britannia Secondary Plan Area (BSPA), in conformity with Halton Region and Town of Milton Official Plan policies. This process includes the determination of policies related to land use, infrastructure, and phasing, as well as the identification of Tertiary Plans/Master Plan Areas.

Through the Secondary Plan process, opportunities and challenges within the BSPA can be better defined and addressed than in an Official Plan, allowing for the development of detailed policies and plans for the particular area. With the Official Plan being the background basis, the Secondary Plan will guide the development area with a better understanding of current and future residents' concerns and vision.

1.2 Background and Purpose of a Transportation Master Plan

A Transportation Master Plan (TMP) is a foundation for transportation decision-making for a municipality. It is a policy document that outlines strategic planning direction for a specific study area. Led by municipal goals, a TMP sets out a community's long-term vision and goals for transportation, identifies suggested infrastructure and service improvements for multiple modes of transportation, and highlights implementation steps. A TMP is usually updated every five to ten years to accommodate social and economic changes in a local, specific, and practical manner. TMPs are often aligned with the community's strategic plan and other planning visions or initiatives.

Developing a TMP for a Secondary Plan is important as it includes a narrower scope than a municipal TMP, in this case focusing on the BSPA specifically. This allows for greater insight into the defined area and a more detailed examination of issues such as growth, community benefits, policies, and trends that are unique to the study area. This TMP seeks to design the BSPA transportation network to ensure that it can accommodate future growth and development that is expected to occur.

This TMP for the Britannia Secondary Plan accommodates the guidelines and vision outlined in the Town of Milton's Town-wide TMP. The Milton TMP is used as the overall plan to guide the creation of the Britannia TMP while keeping the people, community, and transportation system in mind.

Milton's projected growth requires improvements to transportation infrastructure and networks due to high-level impacts on arterial and collector roads. In order to meet the current and future needs of pedestrians, cyclists, transit users, and drivers, this TMP outlines steps and goals to be accomplished. With newly developed mobility hubs and the Milton GO station, goals need to be put in place to explore the connectivity and opportunity of the hubs. As an overall plan for the entire Britannia area, this TMP serves as a guide for the implementation of transportation improvements.

This report provides an overview of the Britannia Secondary Plan Area (BSPA) policy context, existing conditions, alternatives explored, preferred road network and implementation plan. A detailed vehicle traffic analysis was completed for the existing conditions, 2051 future conditions without the BSPA land uses, and 2051 total traffic conditions with the planned land uses for Britannia.

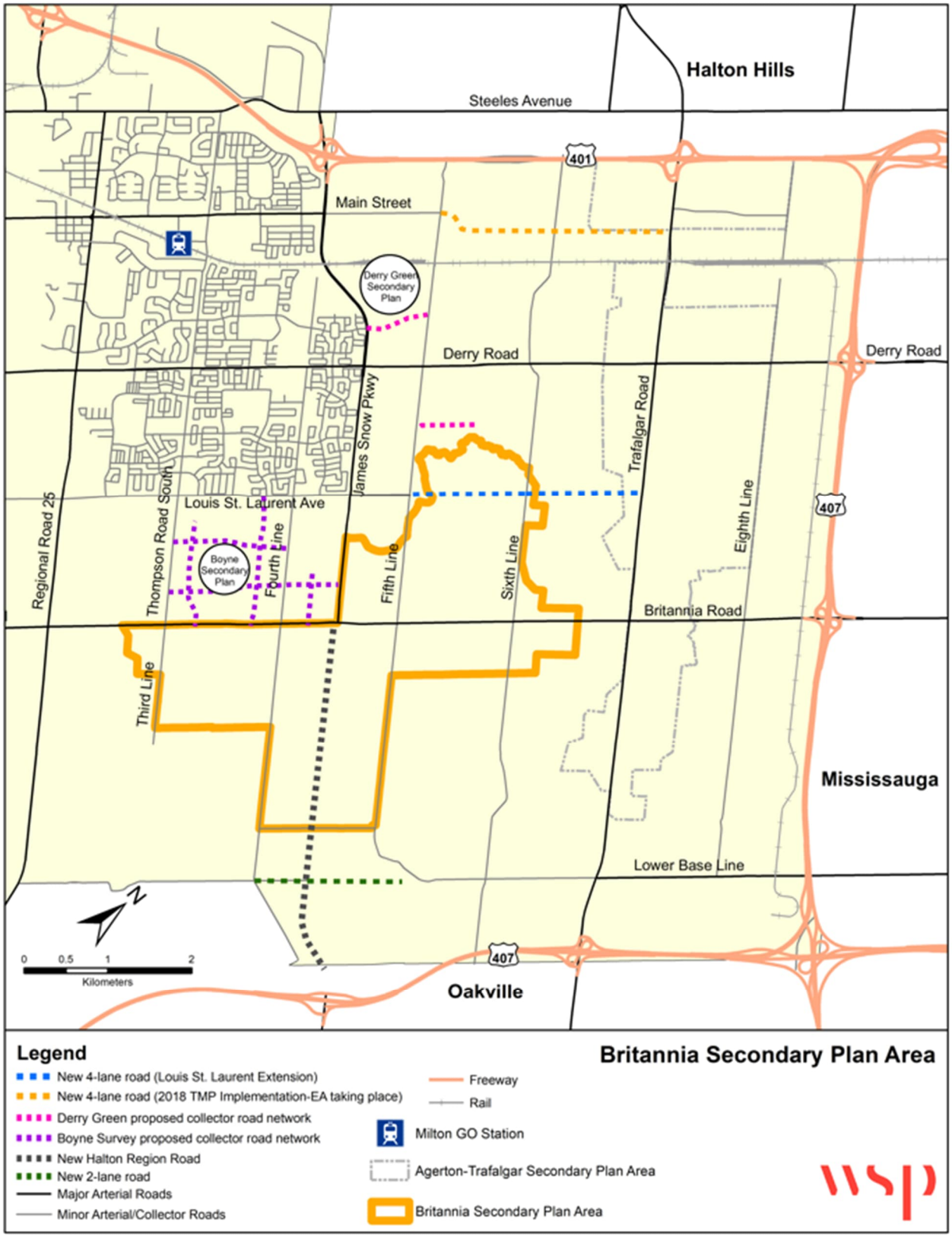
This report updates a 2022 version of the BSPA TMP to reflect the increased population and employment forecasts that are now being considered for the BSPA to the 2051 horizon year.

1.3 Study Area

The BSPA is located on largely agricultural and rural lands in the southern portion of Milton, approximately 6.5 km south and east of Milton's historic town centre and is west of the Agerton Trafalgar Secondary Plan Area and southeast of the Boyne Survey Secondary Plan Area. Major roadways that bound and intersect the Study Area are Britannia Road, Thompson Road South, Fourth Line, James Snow Parkway, Fifth Line, and Sixth Line.

The Study Area is shown in **Figure 1.1**.

Figure 1.1: Study Area



1.4 Development Overview

The BSPA is being planned as a mix of residential land uses with supporting employment and commercial land uses developed over 897 gross developable hectares of land. Approximately 57,500 people are expected to reside in this area, with 9,300 new jobs forecast.

It is envisioned that the area will develop with low to medium density residential land uses with both local and major retail/service nodes that focus on intensity and activity. The retail/service nodes will be located along Britannia Road, James Snow Parkway, New North Regional Road, and Sixth Line to support local and regional transit. The natural heritage system offers the opportunity to plan well connected off-road trails/multi-use paths and cycling facilities throughout the Secondary Plan Area. The area is also planned to provide a full range of publicly accessible spaces, including parks, within walking distance for residents and with opportunities for co-location with schools. The population and residential housing mix, as well as the employment assumptions are outlined in **Table 1.1** and more details of how the employment is categorized is provided in **Table 1.2**. As shown in **Table 1.2,** the jobs related to Commercial land use in mixed use areas are categorized into retail employment, while the jobs included for schools and places of worship are categorized into institutional employment and the jobs included in evolving neighborhoods and residential areas of mixed-use areas are categorized as work from home or no fixed place of work.

Table 1.1: Britannia Secondary Plan Area Development Statistics

Land Use	Units/Number	Population	Jobs
Evolving Neighbourhoods	**14,140**	**49,070**	**3,930**
Singles/Semis	6,830	26,980	2,160
Secondary Suites	680	1,230	100
Townhouses	4,950	15,580	1,250
B2B Townhouses	1,680	5,280	420
Mixed Use Areas	**3,340**	**8,610**	**4,050**
Neighbourhood Commercial Mixed Use	**1,100**	**2,530**	**2,050**
Commercial	-	-	1,840
Road ROW - NC MU	-	-	-
Medium Density Block - B2B	420	1,310	110
High Density Block - Stacked/Apts	680	1,220	100
Urban Village Centre	**2,250**	**6,080**	**2,000**
Commercial	-	-	1,510
Road ROW - Urban Village	-	-	-
Medium Density Block - B2B	360	1,150	90
High Density Block - Stacked/Apts	730	1,320	110
Townhouses	750	2,350	190
B2B Townhouses	400	1,260	100
Schools	**16**		**1,250**
Elementary School	13		650
Secondary School	3		600
Parks	**11**		**-**
District Park	4		-

Land Use	Units/Number	Population	Jobs
Neighbourhood Park	5		-
Existing Parks	2		-
Places of Worship	**7**		**70**
Place of Worship	7		70

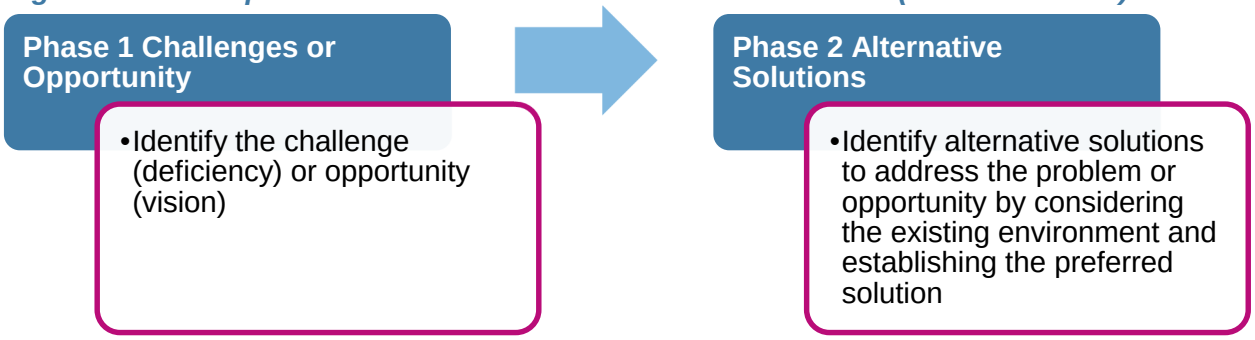
Table 1.2: BSPA Employment Growth Assumptions

Employment Type	Jobs
Retail	3,350
Institutional	1,320
Work from Home/No Fixed Place of Work	4,630
Total	**9,300**

1.5 Municipal Class Environmental Assessment (EA) Process

The Municipal Engineers Association *Municipal Class Environmental Assessment* (MCEA, October 2000, as amended) provides a process in accordance with the *Environmental Assessment Act* (2010) for municipal infrastructure projects. Municipalities undertaking a long-range plan such as a master plan, which addresses the need and justification for future infrastructure, are subject to the MCEA process. Master plans under the MCEA integrate infrastructure planning and provide a strategic level assessment to better address overall system needs and potential impacts and mitigation. Master plans, such as the transportation component of this Secondary Plan, are required to complete Phases 1 and 2 of the five phases of the MCEA process as shown in **Figure 1.2**.

Figure 1.2 Municipal Class Environmental Assessment Process (Phases 1 and 2)



1.6 Vision for the Secondary Plan

The vision for transportation within the Britannia Secondary Plan Area is to implement a multi-modal transportation network accessible to all modes and users of transportation that is well integrated with the Town and Region's transportation system. The vision is needed as the transportation network needs to accommodate the significant growth that is forecast. The vision statement identifies Milton's priorities and common goals to work towards. The vision represents the Problem and Opportunity Statement and meets phase 1 of the EA process.

> To provide a continuous network of multi-modal transportation connections to the Town and Region's transportation system, ensuring that it is accessible for all modes and users.

The vision integrates four key goals:

- Design a complete street network that promotes the safety of all users and is supportive of all modes of travel.
- Provide viable transportation options and choices.
- Connect the rest of Milton and enable regional connectivity.
- Create a foundation for balanced investment in transportation.

2 Policy Context

There are several Provincial, Regional, and Town policies that shape the secondary planning process for the BSPA with respect to transportation. This section provides an overview of the key policies reviewed as part of this report.

The following are the key policy directives and studies that have shaped this TMP:

- Provincial Planning Statement (2024).
- Connecting the GGH: A Transportation Plan for the Greater Golden Horseshoe (2022).
- Greenbelt Plan (2017).
- Metrolinx 2041 Regional Transportation Plan (2018).
- Halton Region Official Plan (ROP, 2022 Office Consolidation).
- Halton Regional Official Plan Amendment No. 38 (2011).
- Halton Region Transportation Master Plan (2011).
- Halton Region Mobility Management Strategy (2017).
- Halton Region Defining Major Transit Requirements (2019).
- Halton Region Active Transportation Master Plan (ATMP, 2015) .
- Milton Official Plan (2024 Office Consolidation).
- Milton Transportation Master Plan (2025).
- Land Base Analysis and Urban Expansion Area (LBA) Report.

2.1 Provincial Policy Framework

Several Provincial policies are relevant from a transportation perspective and will be incorporated into the transportation planning work prepared for the Secondary Plan.

2.1.1 Provincial Planning Statement

On October 20, 2024, the Provincial Policy Statement (PPS) and A Place to Grow were replaced by a new Provincial Planning Statement. Like the PPS before it, the Provincial Planning Statement will provide policy direction on matters of provincial interest related to land use planning and development. All decisions affecting planning matters will be required to be consistent with the Provincial Planning Statement.

The new Statement seeks to support an increased supply and mix of housing options and a strong and competitive economy. It prioritises compact and transit-supportive design where appropriate, as well as optimized investments in infrastructure to support convenient access to housing, quality employment, services, and recreation for all Ontarians.

As it relates to transportation, the Provincial Planning Statement sets out, among other elements, that:

- Planning should support the achievement of complete communities, including by accommodating a mix of transportation options with multimodal access.
- Densities for new housing should support the use of active transportation.
- Transit-supportive development and intensification is required in proximity to transit, including corridors and stations.

- Land use patterns within settlement areas should have densities and land use mixes that support active transportation, are transit-supportive, and are freight supportive.
- Transportation systems should be safe, energy efficient, appropriate to address projected needs, and support the use of zero- and low-emission vehicles.
- Transportation Demand Management strategies should be employed to ensure efficient use of the network.
- Connectivity between different transportation systems and modes should be maintained and improved.
- Transportation corridors should be protected.

2.1.2 Connecting the GGH: A Transportation Plan for the Greater Golden Horseshoe

Connecting the GGH: A Transportation Plan for the Greater Golden Horseshoe ("the GGH Transportation Plan") sets out the province's vision for transportation in the region and includes proposed infrastructure and service improvements, as well as supporting policies.

In terms of infrastructure and services in and around Milton, the GGH Transportation Plan proposes the construction of Highway 413 and expansion of Highway 401 and associated implementation of managed lanes. Improved transit services are also proposed on the Milton GO Line and with higher order transit along Steeles. A new east-west higher order transit connection between Burlington and Oshawa, running roughly along Highway 407, is also identified in the plan.

The Plan further sets out policy direction relevant to Milton and the BSPA, particularly:

- Setting a frequent local transit goal of 10 minutes or less during peak periods.
- Improving 24-hour transit connections to the largest employment areas.
- Ensuring safe and convenient first and last-mile connections between stations and communities.
- Making active transportation more attractive.
- Reducing GHG emissions.
- Reducing or shifting the need to travel.

2.1.3 Greenbelt Plan

The Greenbelt Plan identifies where urbanization should not occur to protect the agricultural land base as well ecological features and functions of the Greater Golden Horseshoe. In addition to protecting the natural heritage and water resource system, the Greenbelt Plan supports the conservation of cultural heritage resources and provides a range of publicly accessible lands for recreation and tourism development.

The BSPA includes and is adjacent to lands under the Greenbelt area as part of the Natural Heritage System. The Natural Heritage System includes lands with the highest concentration of the most sensitive or significant natural features and functions. This system is connected to local, regional, and provincial natural heritage, water resource and agricultural systems beyond the border of the Greenbelt Plan. Municipalities are not permitted to expand into these areas unless they are within existing boundaries of settlement areas.

Key goals of the Greenbelt Plan emphasize the importance of:

- Protecting against the loss and fragmentation of agricultural land.
- Assuring permanent protection to the natural heritage and water resource systems.
- Providing for a diverse range of economic and social activities associated with rural communities.
- Building resilience to mitigate climate change.

2.1.4 Metrolinx 2041 Regional Transportation Plan

The 2041 Regional Transportation Plan (2041 RTP) for the Greater Toronto and Hamilton Area (GTHA) envisions an integrated, multimodal regional transportation system to facilitate residents, businesses, and institutions. It supports Ontario's Growth Plan for GGH and identifies policies on transportation planning in the GTHA.

Around the BSPA, the RTP identifies the following Priority Bus Transit Projects:

- Trafalgar North Priority Bus (Highway 407 – Milton GO).
- Britannia/Matheson Priority Bus (Highway 407 – Renforth Dr.).
- Derry Priority Bus (Bronte Rd. – Humber College).

The plan also recommends expanding the proposed 15-minute two-way all-day GO service to the Milton line beyond 2025 and identifies first- and last-mile travel strategies to support transit use in Milton.

The 2041 RTP also outlines Metrolinx's plan to develop a frequent rapid transit network across the GTHA through the delivery of a regional express bus network along with expanding the current HOV lane network. In the plan, Metrolinx identified the potential for the construction of a separate, dedicated transitway on Highway 407 with 15-minute service or better frequent regional express bus service all day, as well as expanding the HOV lane network to reduce delay for GO bus riders. Due to its tolling structure, Highway 407 has a high-level of service that would support Metrolinx's vision for a faster, more reliable, and more attractive Frequent Rapid Transit Network. The 2041 RTP also outlines Metrolinx's consideration to establish upgraded stations and transit connections along Highway 407 to improve the effectiveness of frequent east-west bus route in the highway corridor.

2.2 Regional Policy

Regional policies will also influence transportation planning for the Britannia Secondary Plan.

2.2.1 Halton Region Official Plan (ROP) & Amendment No. 38

As of July 1, 2024, through changes to the Planning Act, the Province has identified Halton Region as an "upper-tier municipality without planning responsibilities". As a result, the Region is no longer responsible for the Regional Official Plan. Instead, it has been deemed an Official Plan of the Region's local municipalities. This means there are now two Official Plans which apply to and are the responsibility of the Town – the Halton Region Official Plan and the Town of Milton Official Plan. The Town is currently preparing a new Official Plan that will integrate policies of the ROP.

The policies of the ROP relate to a wide range of topics including but not limited to:

- The setting of urban area boundaries to accommodate growth and to protect farmland.
- The protection of environmentally-sensitive areas and promotion of land stewardship.
- The promotion of economic development.
- The delivery of urban Greater Toronto Area (GTA) services such as water supply and wastewater treatment, transportation, energy, and utilities.
- The building of healthy, complete, and sustainable communities.

Regional Official Plan Amendment No. 38 (ROPA 38) was intended to update the ROP and bring it into conformity with the PPS, Growth Plan, and Greenbelt Plan available at the time of ROPA 38 (approved in December 2009) and other relevant provincial plans and policies. It identified additional lands in the Town of Milton that are to accommodate population and employment growth from 2021 to 2031. The lands identified for growth serve as Milton's next Urban Expansion Area and next major Secondary Plans, including the Britannia Secondary Plan.

2.2.2 Halton Region Transportation Master Plan (2011)

The Halton Region Transportation Master Plan (2011) plans for a multi-modal transportation network to support the movement of people and goods to 2031. Through the development of the TMP, 72 per cent of travel demand was targeted to be auto trips, 3 per cent through transportation demand management (TDM) measures, 5 per cent through active transportation, and overall 20 per cent by internal / external transit. Using screen line analysis, the Halton Regional TMP identified deficiencies in the Regional road network in the context of continued growth through 2031. To remedy the capacity deficiencies, road widenings were proposed for several Regional roads. The Region's TMP analysis identified that most of the Regional roads within the urban boundary would be widened.

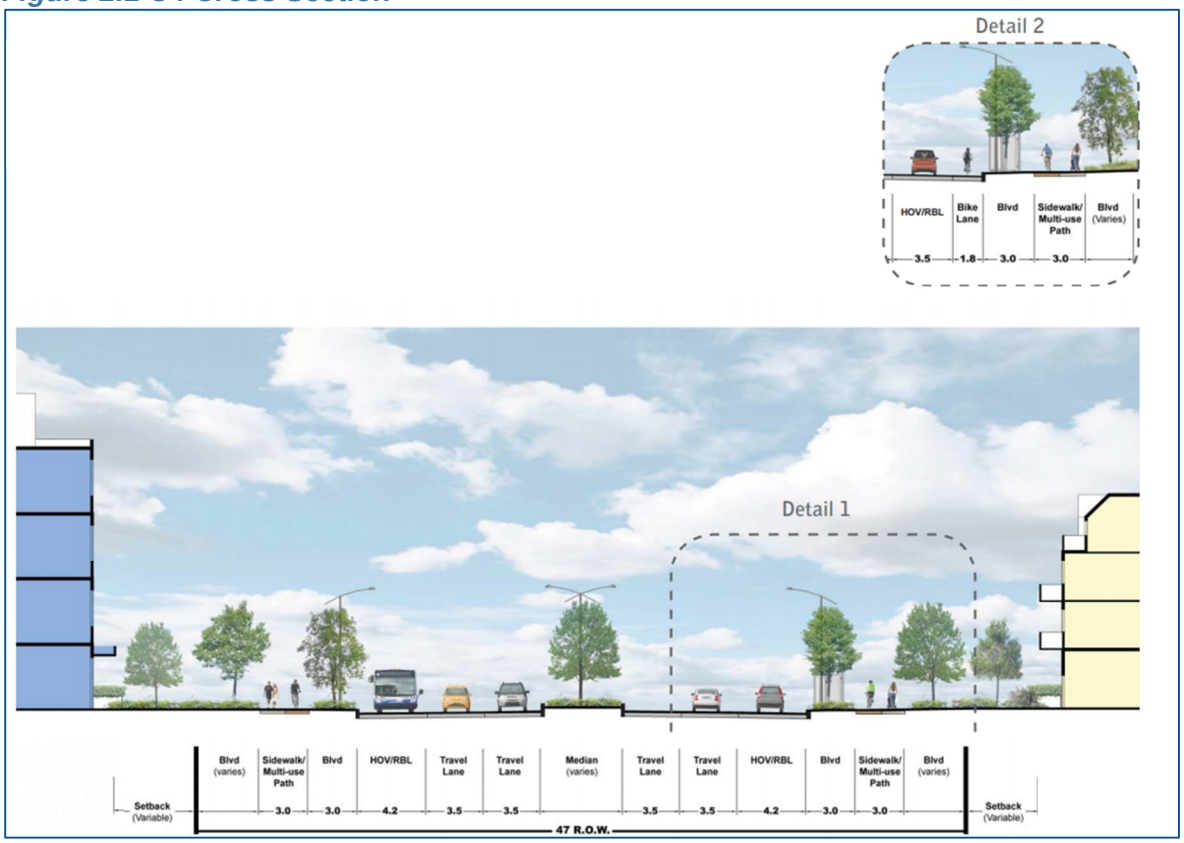
The Halton Region TMP identified capital improvements on the New North Regional Road, James Snow Parkway and Britannia Road. The projects as identified in the Halton Region Budget and Business Plan 2025 are as follows:

- New North Regional Road (new 6 lane road north of Britannia Road) (Note: Halton Region initiated an Environmental Assessment to study this road corridor in 2025).
- James Snow Parkway (widening from 4 to 6 lanes from Britannia Road to Highway 401)
- James Snow Parkway (extension from Britannia Road to Hwy 407)
- Trafalgar Road (widening from 4 to 6 lanes from Britannia Road to Steeles Ave)

The Britannia Road widening to six lanes east of Regional Road 25 has been completed as of 2024. Britannia Road, Trafalgar Road and Regional Road 25 are identified as four lanes plus two lanes for transit / high occupancy vehicles, and are classified as ROW type C4 Urban. This ROW type includes a proposed width of 47 m, 4 travel lanes, 2 high-occupancy vehicle (HOV) or reserved bus lanes (the curb lanes include provision to accommodate potential HOV / transit lanes in the future, subject to future study), boulevards, and multi-use paths on both sides. A typical cross-section of C4 Urban with boulevard detail is shown in **Figure 2.1**.

An update to the Halton Region TMP is currently underway as part of an Integrated Master Plan.

Figure 2.1 C4 Cross Section



Source: Halton Region Transportation Master Plan (2031) – The Road to Change

2.2.3 Halton Region Mobility Management Strategy (2017)

Subsequent to the Halton Region TMP, Halton Region carried out the Mobility Management Strategy (MMS) which included a Region-wide grid network of approximately 156 km of key transit priority corridors and approximately 36 km of mobility links. These links and corridors were established in support of the MMS to connect throughout Halton Region and to provide connections to the City of Mississauga, the City of Brampton and the City of Hamilton. These corridors build upon the Higher Order Transit Corridors identified in the Regional Official Plan and Transportation Master Plan documents, with some additions and extensions.

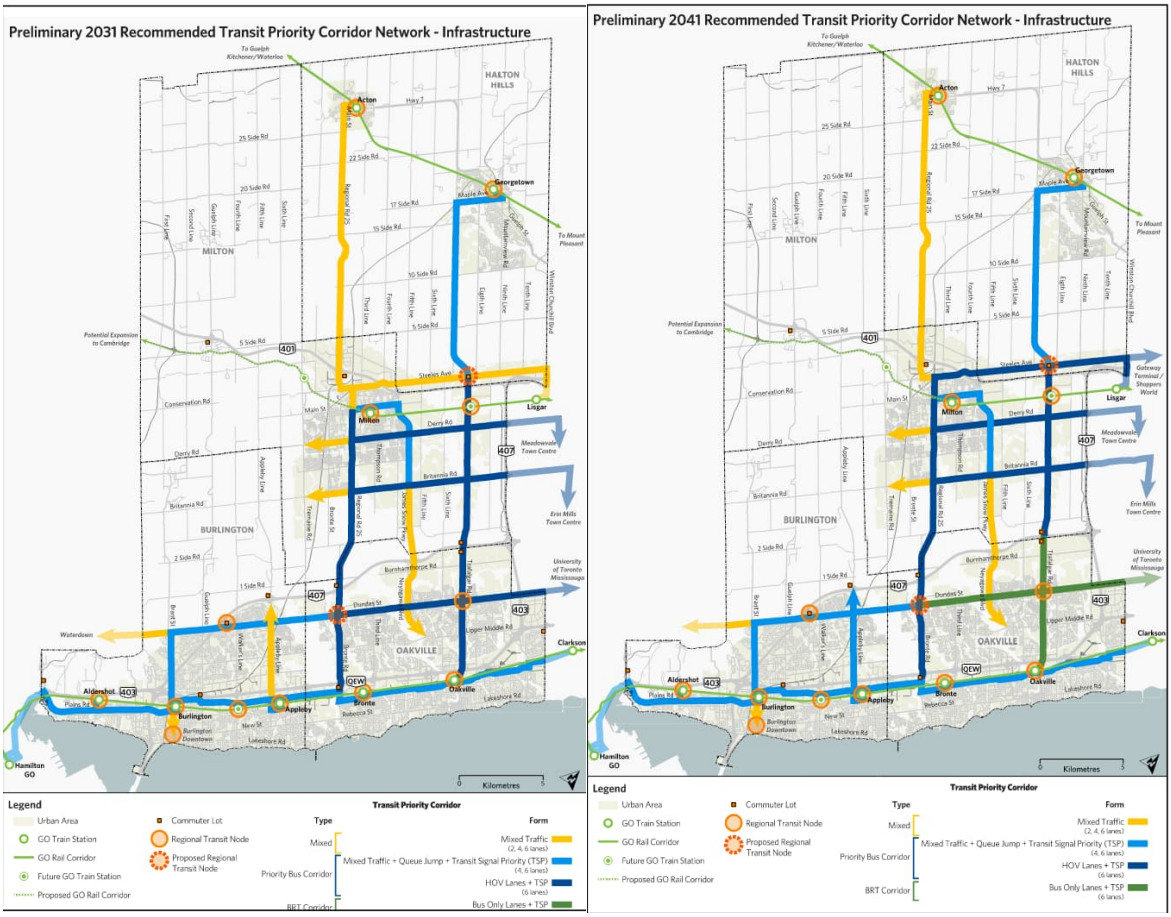
2.2.4 Defining Major Transit Requirements

Subsequent to the Mobility Management Strategy, Regional Council endorsed Report No. LPS45-19/PW-18-19 re: “Defining Major Transit Requirements in Halton” in 2019. Based on the MMS, the study delineated the 2031 and 2041 Preliminary Transit Priority Network, by defining the “Type”, “Form”, and “Function” of the Transit Priority Corridors as identified in the MMS, in order to identify order-of-magnitude investment requirements for the Transit Priority Corridors that support inter/intra-regional connections and the potential growth of the Major Transit Station Areas.

As part of the Defining Major Transit Requirements Study, Preliminary 2031 and 2041 Recommended Transit Priority Corridor Networks were identified, as shown in Figure 2.2. The

networks comprised of mixed traffic corridors, priority bus corridors (with transit priority measure such as transit signal priority and queue jump lanes) and bus rapid transit corridors (with dedicated transit lanes).

Figure 2.2 Preliminary 2031 and 2041 Draft Recommended Transit Priority Corridor Networks



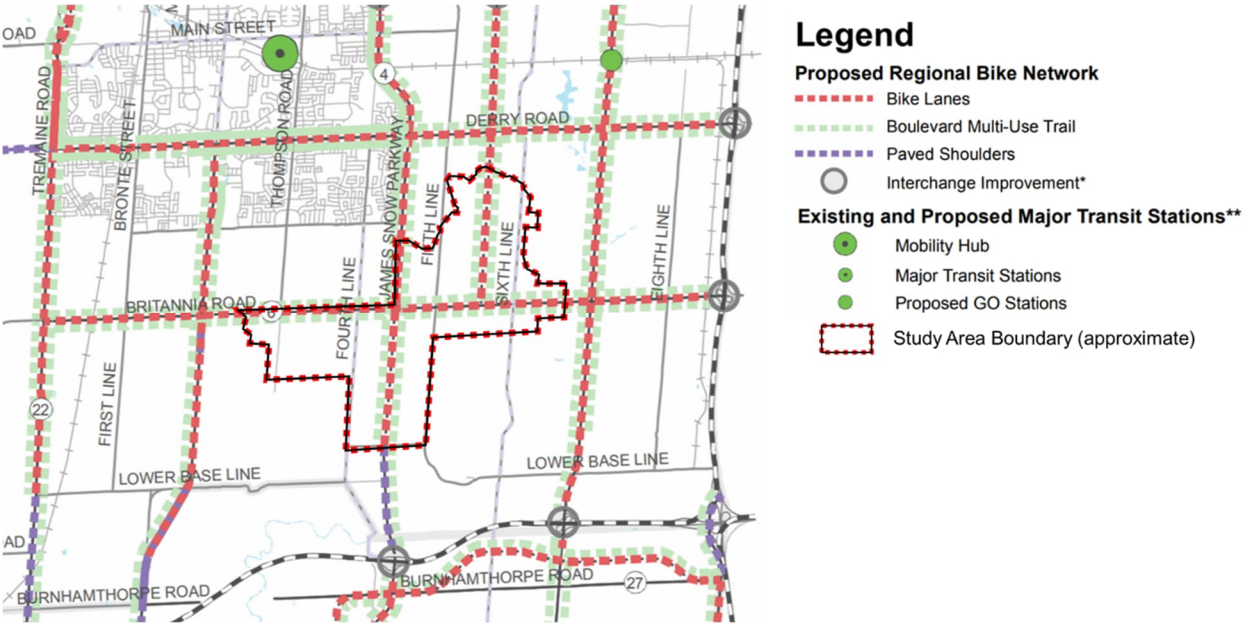
Source: Defining Major Transit Requirements in Halton (2019)

2.2.5 Halton Active Transportation Master Plan (ATMP)

The 2015 Halton Region ATMP provides guidance for on-road and off-road infrastructure investments for any human-powered transportation mode to 2031. These modes include walking, cycling, in-line-skating, and moving with mobility devices. Within the BSPA, the ATMP proposes bike lanes and boulevard multi-use trails along Britannia Road, James Snow Parkway, and the future New North Regional Road by 2031. **Figure 2.3** below shows the proposed active transportation improvements.

The ATMP is being updated as part of Halton Region's Integrated Master Plan.

Figure 2.3 Halton ATMP Proposed Improvements



Source: Halton Region Active Transportation Master Plan – Proposed Regional Cycling Network (2015)

2.2.6 Halton Region Access By-Law 32-17

All development within the BSPA must conform to Halton Region's Access By-Law No. 32-17, a by-law to prohibit, restrict, and regulate access to the Regional road system. The purposes, goals, and objectives of this By-law are to:

- Ensure that the Region has legal authority to use the full array of measures available to it to prevent unauthorized access to a Regional road and ensure compliance with all policies, standards, guidelines, and decisions that apply to Regional road access and to the maintenance and upkeep of Regional road access.
- Ensure that access to a Regional road is limited to maintain a high level of service for through traffic.
- Ensure that where new access is necessary, such access is planned, designed, maintained and operated for safe access and to maintain a high level of service for through traffic.
- Implement into law the Region's administrative practices regarding access, including its longstanding review and approval process for new access to a Regional road.
- Provide appropriate delegation of administrative powers and responsibilities to ensure that every application for access to a Regional road is processed fairly and efficiently, and results in a written decision that is timely, public, and supported by reasons.

The Access By-Law implements the following policies for access:

- Access to a Regional road from private property shall be permitted only where such access is necessary because access to a local road is not feasible.
- Where access to a Regional road from private property is necessary, the applicant for access shall, following consultation with the Region and in accordance with Region direction, submit a study that considers all reasonable alternative access locations, types, and designs.

- Access shall maintain the safety, function, and efficiency of Regional roads.
- Access shall maintain or enhance the multiple uses of Regional rights-of-way beside Regional roads.
- The Region may require that an application for access be accompanied by a transportation impact study.
- Access shall be finalized, constructed, and made operational prior to development or any other change in the use of land that depends on access.

With a transportation network concept that provides collector roadway connections to Regional Roads, opportunities increase for developments fronting Regional Roads to be accessed via the collector roadways instead of the Regional Roads, thus protecting the through traffic function of the Regional Roads and following the established roadway classification hierarchy of arterial and collector roadways.

2.2.7 Halton Region Access Management Guideline

All development and access planning within the BSPA along Regional roads must conform to Halton Region's Access Management Guideline. The purpose of the Guideline is to provide direction to developers, planners, and consultants on Halton Region's best practices in access management.

Access management allows the Region to effectively manage the provision of access to the public road system for new development or redevelopment. The major objective is to provide safe access which is consistent with the function and operation of the public road system and access needs of the adjacent land uses. In addition, it achieves the necessary balance between traffic movement and land use access by careful control of the location, type and design of driveways and intersections. Any approved development accesses to Regional roads within the BSPA must conform to the access spacing and design requirements set out in the Access Management Guideline.

2.3 Town Policy

The Town has completed significant planning and policy work to frame the development of the BSPA. This section highlights how transportation planning will be shaped by existing Town policy.

2.3.1 Town of Milton Official Plan & Amendment No. 31

Key goals of the Milton Official Plan include:

- Build and maintain a diverse and vital economy.
- Build and maintain a safe, liveable, and healthy community.
- Protect and enhance our heritage, identity, and character.
- Maximize the benefits of the Niagara Escarpment and the natural environment.
- Provide responsible cost-effective local government and services.

Official Plan Amendment 31 (OPA 31) updated the Milton Official Plan to bring it into conformity with provincial and regional planning documents. OPA 31 implements population and employment goals for Milton to 2031 and incorporates the applicable urban boundary

expansions established through the sustainable Halton planning exercise to accommodate that projected population and employment growth.

The Town is currently preparing a new Official Plan to manage growth. New policies reflect recent provincial and regional policy changes and respond to local trends and needs.

2.3.2 Milton Transportation Master Plan (2025)

Milton prepared its first Town-wide Transportation Master Plan (TMP) in 2018 to leverage existing infrastructure and proactively plan a balanced, multi-modal transportation network to serve its existing community as well as forecast growth in people and jobs to the year 2031 and beyond.

The Town completed an update to the TMP in 2025, considering additional population and employment growth to the 2051 horizon year.

The Britannia TMP aligns with the Town-wide TMP and incorporates a number of road network improvements into the analysis, including:

- Extension of Louis St. Laurent Avenue to Trafalgar Road
- Widening Sixth Line to four lanes from Britannia Road to Lower Baseline Road;
- Connecting Lower Baseline Road between Fourth Line and Fifth Line
- Widening Lower Baseline Road between Fifth Line and the Town's eastern boundary

The road classifications identified in the TMP also have been applied to the Britannia TMP. The Britannia TMP conforms to the multi-modal transportation network planning and supporting transportation policies shown in the Town-wide TMP.

2.3.3 2024 – 2029 Milton Transit Five-Year Service Plan and Transit Master Plan Update

The Town's Transit Master Plan Update indicates the likely expansion of the Milton Transit network in the short, medium, and long term. Of note for the BSPA, the feasibility of reserving land for a future a transit terminal is being recommended at the intersection of James Snow Parkway and Britannia Road.

Urban expansion areas, such as Britannia, have been acknowledge as needing new transit services in the next 5 to 10 years. Service hours have been individually allocated to operate transit service in Britannia. The plan recommended that routes serving urban expansion areas, including Britannia, are planned for potential connections into terminals in Mississauga and Oakville.

2.4 Background Studies

2.4.1 Relevant Environmental Assessments

Britannia Road Widening Environmental Assessment

Halton Region completed a Municipal Class Environmental Assessment (EA) Study to address future travel demands on Britannia Road (Regional Road 6) from Highway 407 to Tremaine Road (Regional Road 22), within the Town of Milton. The recommended preferred design includes the widening of Britannia Road to 6 lanes from Tremaine Road to Highway 407 and a south by-pass of the roadway around the Omagh Community and a grade separation at the CN rail crossing. The recommended design includes 3.0 metre multi-use paths and 1.8 metre on road cycling lanes on both sides of the corridor.

Trafalgar Widening Environmental Assessment

In April 2014, Halton Region initiated the Trafalgar Road Transportation Corridor Improvements Class Environmental Study (Class EA) between Steeles Avenue (Regional Road 8) and Highway 7 in the Town of Halton Hills. The Class EA Study identified the problems and opportunities for improvements on Trafalgar Road to satisfy future travel demands to 2031. The Environmental Assessment of the Trafalgar Road section within the Town of Halton Hills was completed in June 2016.

The Environmental Assessment of Trafalgar Road within the Town of Oakville was initiated in April 2015. The Class EA identified the problems and opportunities of the Trafalgar Corridor improvements between Cornwall Road and Highway 407. An Environmental Study Report (ESR) has been prepared to document the planning, public consultation and decision-making process undertaken for the study. The EA for this section of Trafalgar Road was completed in April 2015. The EA recommends widening Trafalgar Road within the study area to a six-lane cross-section, including four general purpose lanes with the provision for two HOV / BRT lanes on the existing alignment. The EA also recommends implementing transportation demand management measures on a Region-wide basis.

Louis St. Laurent Avenue Extension

The Town completed an Environmental Assessment in 2020 for the extension of Louis St. Laurent Avenue from James Snow Parkway to Fifth Line. Louis St. Laurent Avenue remains a minor arterial road with four travel lanes (two in each direction).

Fifth Line Widening Environmental Assessment

The Town completed an Environmental Assessment for the widening of Fifth Line between Derry Road and Britannia Road. Fifth Line will be a minor arterial road with four travel lanes (two in each direction).

New North Regional Road Corridor Environmental Assessment

Halton Region has initiated an Environmental Assessment in 2025 to identify a new North Regional Road corridor between Fifth Line and Sixth Line from Britannia Road to Steeles Avenue. The Environmental Assessment will examine a wide range of road improvements including a new corridor. In addition, improvements will consider active transportation, traffic and intersection operations.

Land Base Analysis and Urban Expansion Area (LBA)

The Land Base Analysis (LBA) identifies key opportunities and constraints to the BSPA and provides direction to the future land use planning of the area. The LBA assesses the approximate amount and distribution of unconstrained land for development, feasibility of development, potential public infrastructure needed to facilitate development and draws up a framework for future planning processes.

The LBA recommends adopting and implementing a Secondary Plan as the next step in the planning process. The Secondary Plan should establish boundaries of the area, and a land use and transportation framework. The transportation plan component will need to include pedestrian and cycling facilities and transit routes to promote multi-modal travel.

2.5 Planning Principles

The transportation planning principles for the Britannia Secondary Plan are adapted from the Town's 2018 TMP and ongoing TMP update. The planning principles followed are:

- Provide viable transportation options and choices to travel.
- Design a system that supports multi modal travel emphasizing active transportation (walking and cycling), public transit and carpooling for users of all ages and abilities.
- Plan for land uses that reduce the need to travel, including more compact urban form, mixed uses, land use intensification, and transit-supportive development.
- Establish a logical road network.
- Establish a system that supports moving people and goods.
- Establish seamless connectivity to surrounding municipalities and the greater region.
- Promote sustainability.
- Design infrastructure that supports the natural heritage.

2.6 Policies Implementation

The Britannia Secondary Plan Area provides opportunities for connections between the Britannia Corridor and nodes within and outside the Town. The following are the proposed network recommendations based on Regional and Town policies.

- The Region's TMP planned capital improvements include planned widenings of Britannia Road and James Snow Parkway, as well as two new roads, New North Regional Road and the James Snow Parkway extension.
- The Region's TMP and Defining Major Transit Requirements report identify Britannia Road, Trafalgar Road and Regional Road 25 as transit priority corridors that will include vehicular travel lanes, high-occupancy vehicle (HOV) or reserved bus lanes, boulevards, and multi-use paths on both sides.
- The Milton TMP proposes an extension of Main Street East to Trafalgar Road. The new road will serve the proposed GO train station near Trafalgar Road and Derry Road as proposed in the Region's Official Plan.
- The Milton TMP proposes an extension of Louis St. Laurent Avenue to Trafalgar Road.
- The Town has initiated an Environmental Assessment to study the widening of Sixth Line from Highway 401 to Britannia Road.
- There are proposed active transportation connections, including boulevard multi-use paths planned along Britannia Road, James Snow Parkway, Regional Road 25, and the

future New North Regional Road as part of the Regional TMP and Active Transportation Master Plan.

- The existing land space available can accommodate a comprehensive network of local and collector roads to provide connectivity within the future developed lands. Multiple road network alternatives can be conceptualized at this stage given the current level of development.

3 Existing Conditions

3.1 Road Network

The road network in the BSPA includes Regional and Town roads, providing connectivity to other areas of Milton as well as neighbouring municipalities such as Mississauga and Oakville. The Regional arterial roadways form block grids and function as the main thoroughfares connecting to the Provincial highways and intersecting with other Town arterial and collector roadways.

3.1.1 Regional Roads

Britannia Road (Regional Road 6) is an east-west major arterial roadway with an urban six-lane cross section operating with a posted speed limit ranging between 60 km/h and 80 km/h throughout the study area as of late 2024. Britannia Road extends from the western boundary of Milton into the middle of Mississauga.

Regional Road 25 is a north-south major arterial roadway with a rural four-lane cross-section. Within the study area, Regional Road 25 has a speed limit of 60 km/h. Regional Road 25 extends from Halton Hills to Highway 407.

Trafalgar Road (Regional Road 3) is a north-south major arterial roadway with a rural four-lane cross-section and a speed limit between 60 km/h and 80 km/h within the study area. The speed limit is 70 km/h north of Derry Road, 60 km/h between Derry Road and Britannia Road, and is 80 km/h at the Lower Base Line intersection. Trafalgar Road serves as the primary north-south arterial roadway of Oakville and extends to Halton Hills in the north.

Derry Road (Regional Road 7) is an east-west major arterial roadway with a rural four-lane cross-section operating with a posted speed limit of 80 km/h within the study area. Derry Road begins at the western boundary of Milton connecting to Mississauga and eventually into Toronto.

James Snow Parkway (Regional Road 4) is a north-south major arterial roadway with a rural two-lane cross-section and a speed limit of 70 km/h. James Snow Parkway extends from Highway 401 to Britannia Road.

3.1.2 Town Roads

Louis St. Laurent Avenue was an east-west minor arterial roadway with a two-lane cross-section and a speed limit of 50 km/h in 2020. In 2021, the road was expanded to an urban four-lane cross-section and the speed limit increased to 60 km/h. Louis St. Laurent Avenue extends from Regional Road 22 to the west and Fifth Line to the east.

Thompson Road South is a north-south minor arterial roadway north of Britannia Road. Thompson Road South had a four-lane cross-section with a speed limit of 70 km/h in 2020. In 2021, the road was expanded to an urban four-lane cross-section and the speed limit was

decreased to 60 km/h. Thompson Road South extends from Steeles Avenue East to Britannia Road.

Third Line is a collector roadway south of Britannia Road with a rural two-lane cross-section and a speed limit of 70 km/h. Third Line extends from Britannia Road to approximately 1.5 km south of Britannia Road.

Fourth Line is a collector roadway with a rural two-lane cross-section and a speed limit of 60 km/h north of Britannia Road and 70 km/h south of Britannia Road. Fourth Line extends from Regional Road 7 (Derry Road W) to approximately 1.0 km south of Lower Base Line W.

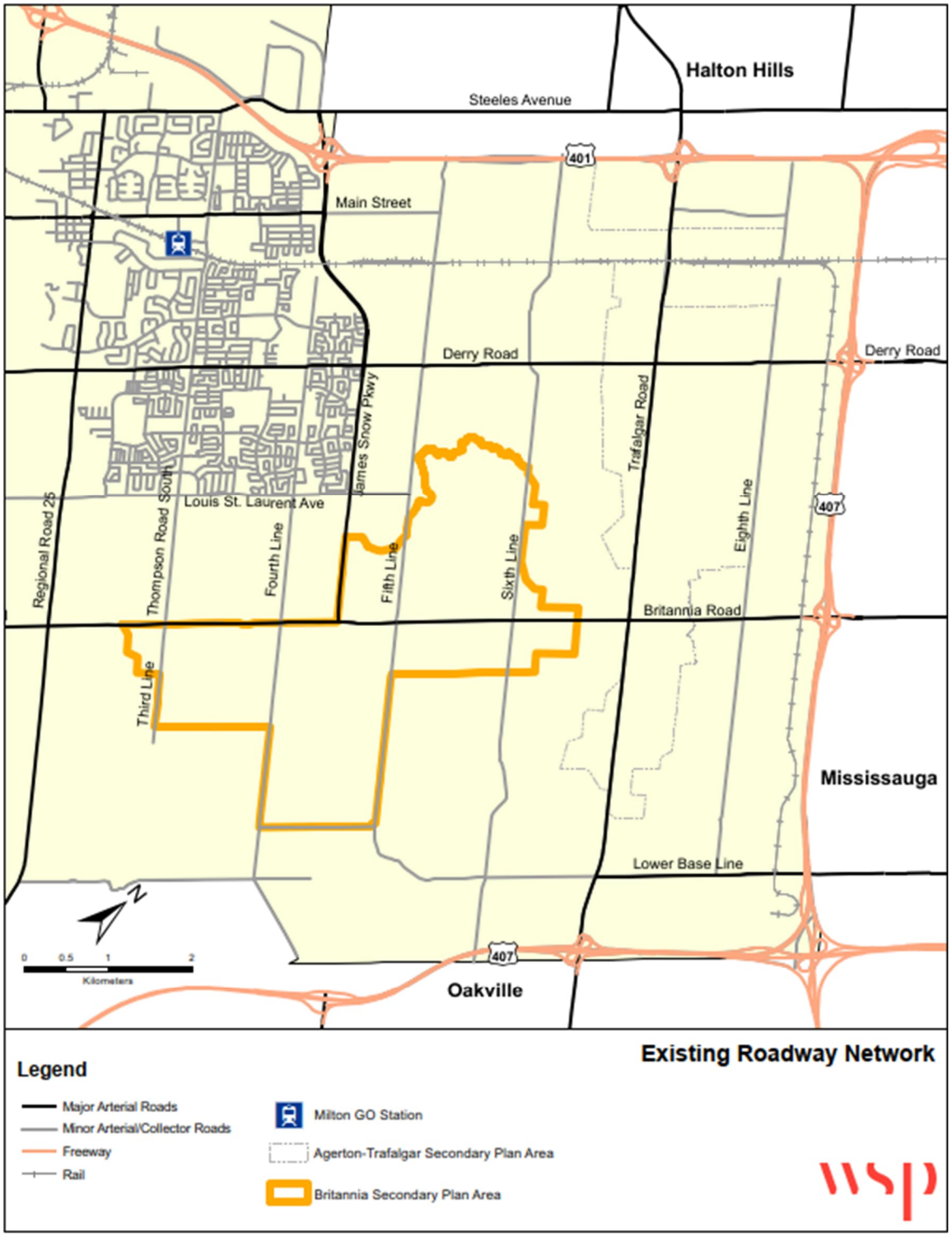
Fifth Line is a north-south minor arterial roadway that extends from Steeles Avenue East to Lower Base Line W. It has recently been urbanized and widened to four lanes from Main Street to Derry Road. Further urbanization and widening to four lanes is expected to Britannia Road.

Sixth Line is a north-south minor arterial roadway with a rural two-lane cross-section and a speed limit of 70 km/h. Sixth Line extends Steeles Avenue East to the middle of Oakville. The Town has initiated an Environmental Assessment to study road widening from Highway 401 to Britannia Road.

Lower Base Line is an east-west collector roadway with a rural two-lane cross-section operating and speed limits varying between 60 km/h and 70 km/h. Lower Base Line crosses Highway 407 into Mississauga, where it becomes Eglinton Avenue.

The existing road network is shown in **Figure 3.1**.

Figure 3.1: Existing Road Network



3.2 Transit Network

Public transit services do not currently serve the BSPA directly, however there are a number of routes nearby that serve as opportunities for future connections.

3.2.1 Inter-Regional Transit

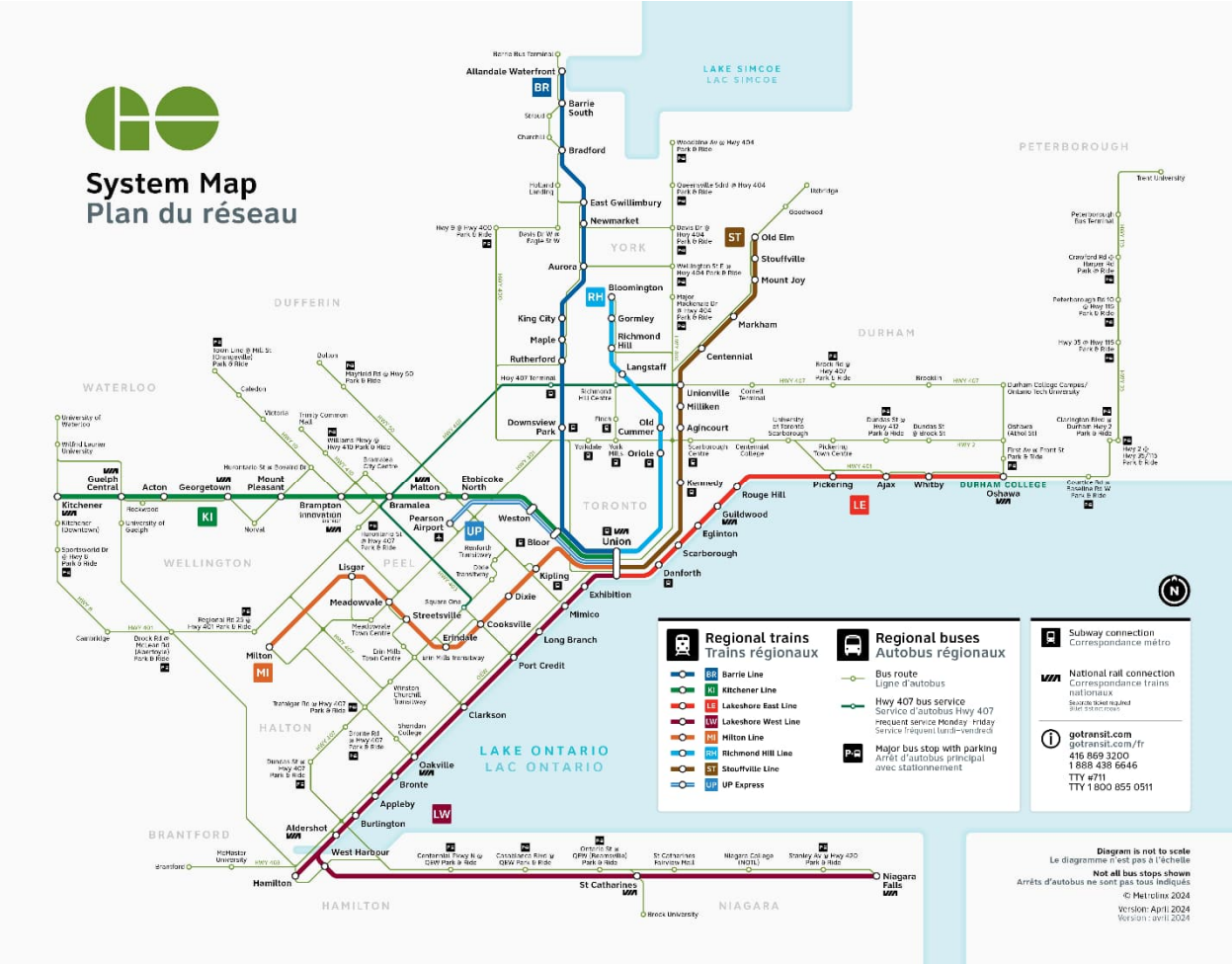
GO Transit, a division of Metrolinx, provides inter-regional transit service across the Greater Toronto and Hamilton Area. GO Transit is made up of commuter rail and bus services. Milton GO, located on Drew Centre, near Main Street East and Thompson Road South, serves as the primary hub for the Town. The Milton Line rail service connects Milton GO to Toronto's Union Station during weekday morning and afternoon peak hours only. GO bus service supplements this rail network to connect to the hub and the rest of the Town. Although no routes directly connect to the BSPA, Route 21, a bus service, links Union Station to Milton GO via Square One in Mississauga. It operates at approximately 30-minute to 60-minute headways in the early morning, 60 minutes mid-day, and 30 minutes to 60 minutes in the evening.

Route 22, the Milton/Oakville bus service, also operates close to the BSPA, connecting Milton to Toronto Union Station. The service stops at the Milton GO Station, and close to the BSPA at the Trafalgar Road interchange with Highway 407. It operates on weekdays only, with 7 trips a day in each direction.

Route 27, the Milton/North York bus service, connects Milton GO to the Finch Bus Terminal. While it does not directly serve the BSPA, it operates along Derry Road just north of the area. The route serves connections to Meadowvale GO, Yorkdale Bus Terminal, and Yonge & Sheppard. Route 27 operates primarily on weekdays from Milton, with about 15 trips a day in each direction. It also operates one early morning trip in both directions on weekends.

The inter-regional transit and bus transit networks as they relate to Britannia Corridor are shown in **Figure 3.2, Figure 3.3**, **Figure 3.4**, and **Figure 3.5**.

Figure 3.2 Inter-Regional Rail and Bus Transit Network

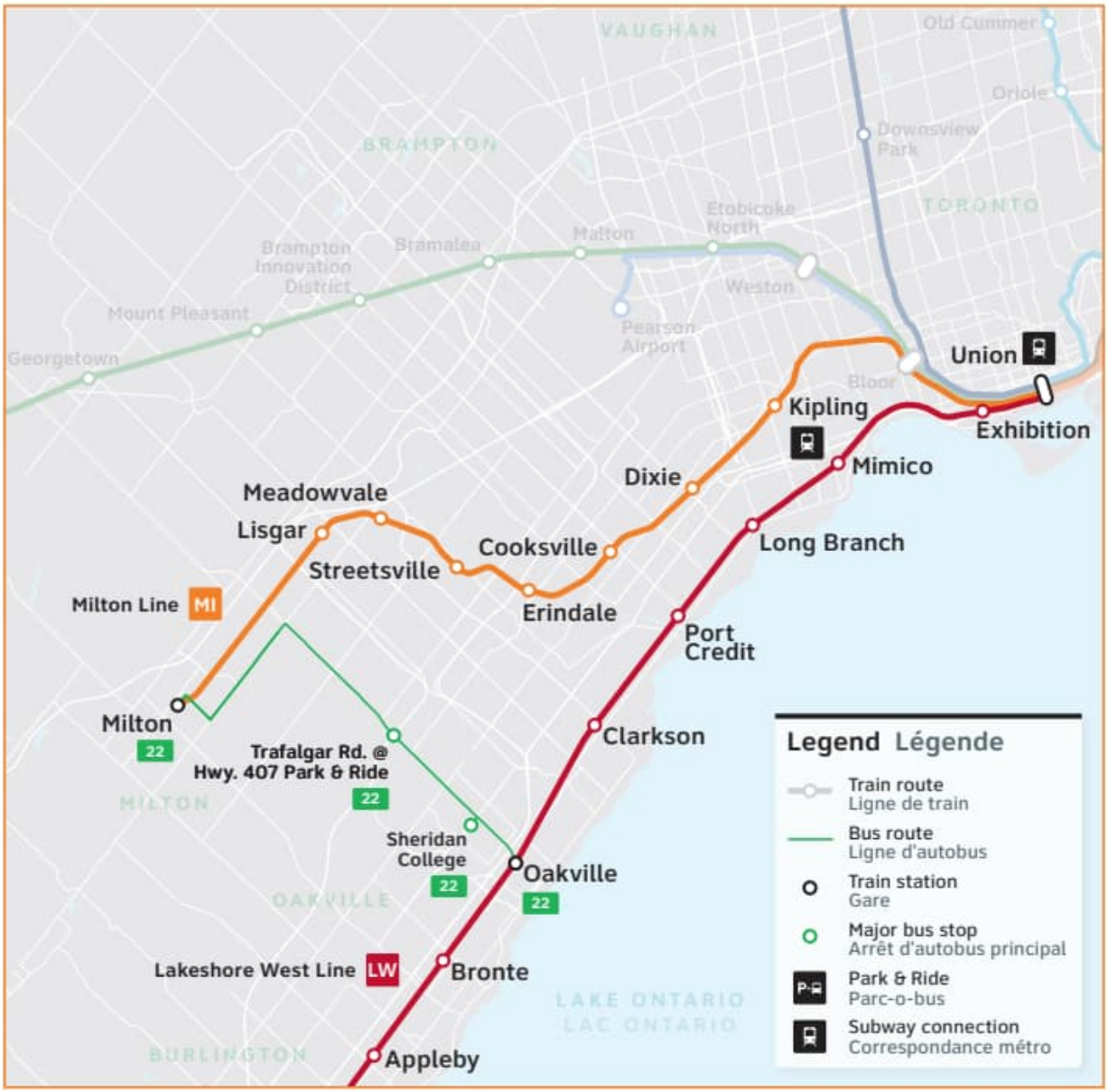


Source: GO Transit System Map (May 2024)

Figure 3.3 GO Transit Route 21

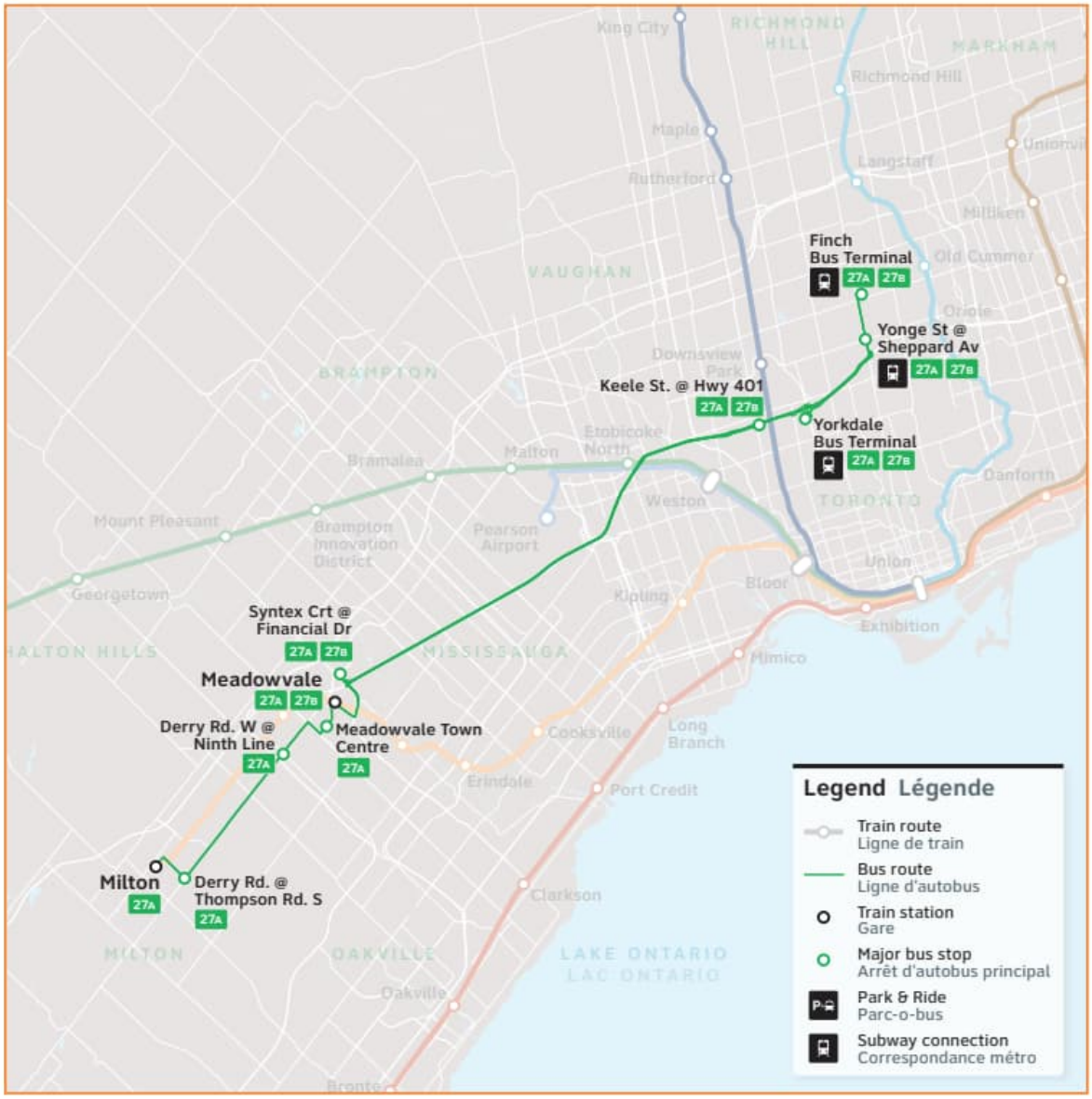
Source: GO Transit PDF Schedules (October 2024)

Figure 3.4: GO Transit Route 22



Source: GO Transit PDF Schedules (October 2024)

Figure 3.5: GO Transit Route 27

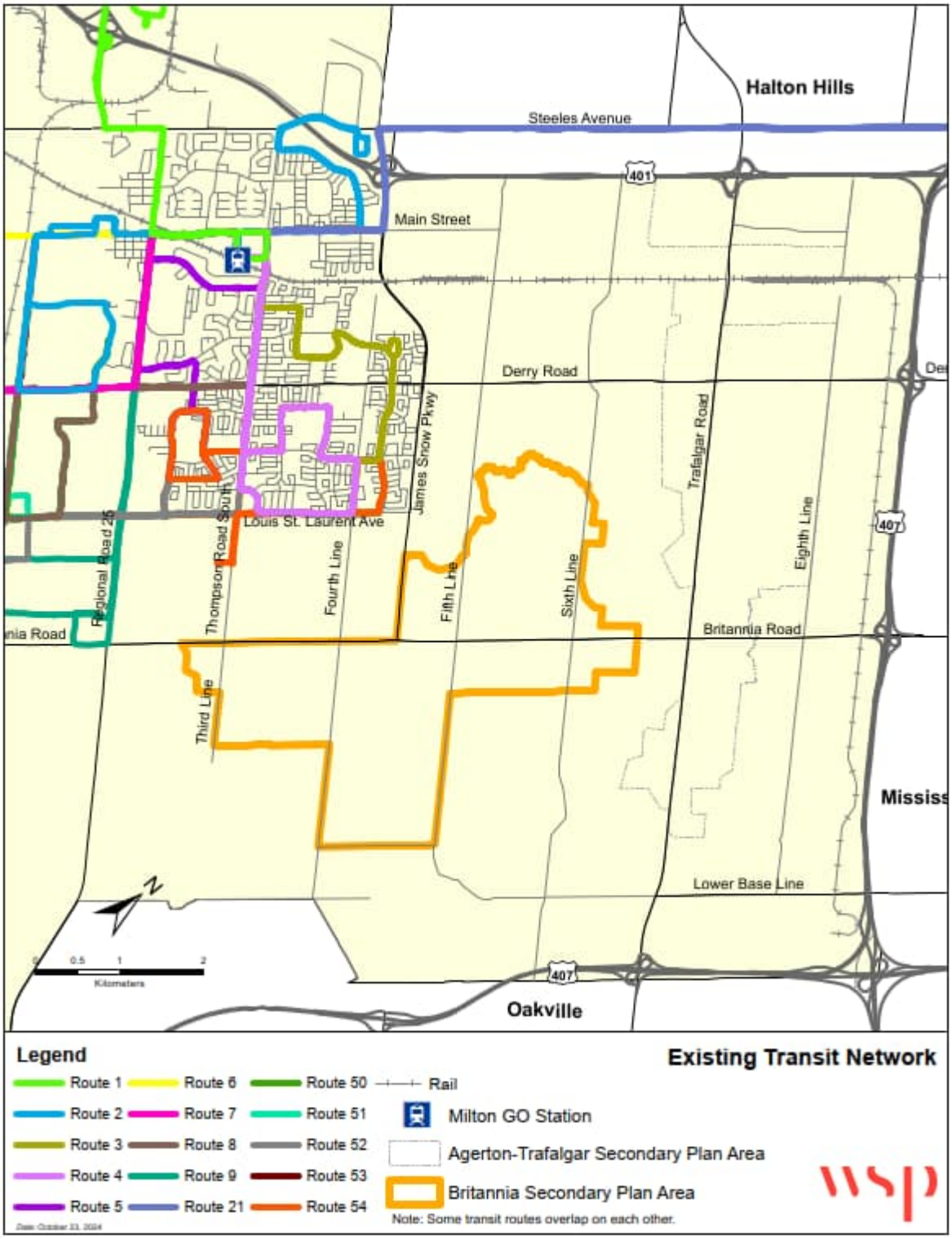


Source: GO Transit PDF Schedules (2024)

3.2.2 Municipal Transit

Milton Transit, the municipal transit system, consists of ten routes that also connect to GO Transit via Milton GO. Milton Transit does not currently provide service in the BSPA due to limited development in the study area, which does not generate the needed demand. **Figure 3.6** shows the existing Milton Transit Network near the study area.

Figure 3.6: Existing Milton Transit Network

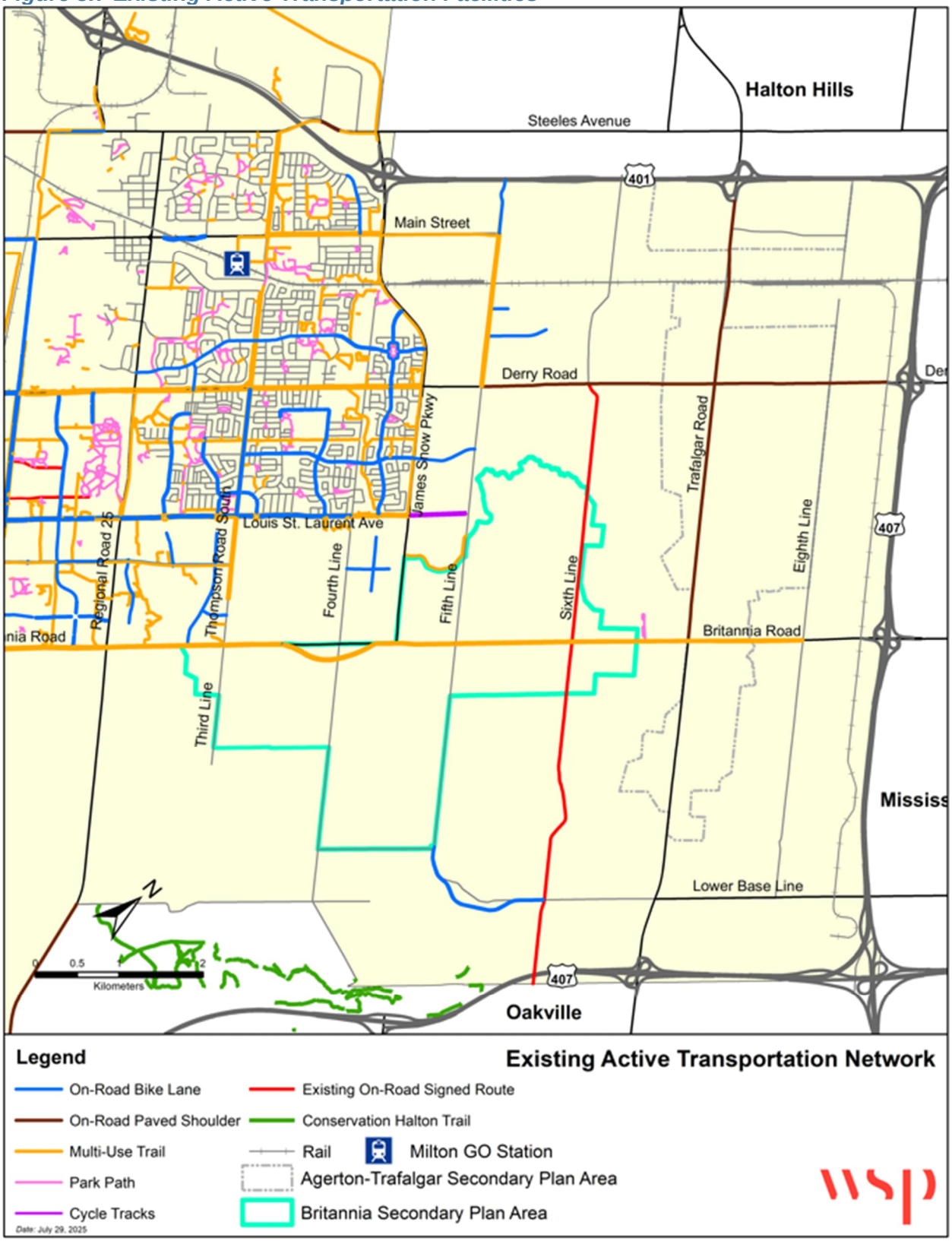


3.3 Active Transportation and Trail Conditions

Currently there are no dedicated sidewalks or cycling facilities located within the BSPA, except for the multi-use trail along Britannia Road.

The existing active transportation facilities near the BSPA are shown in **Figure 3.7**, and include off-road trails and on-road bike lanes, multi-use trails, paved shoulders, and signed routes.

Figure 3.7 Existing Active Transportation Facilities



3.4 Goods Movement

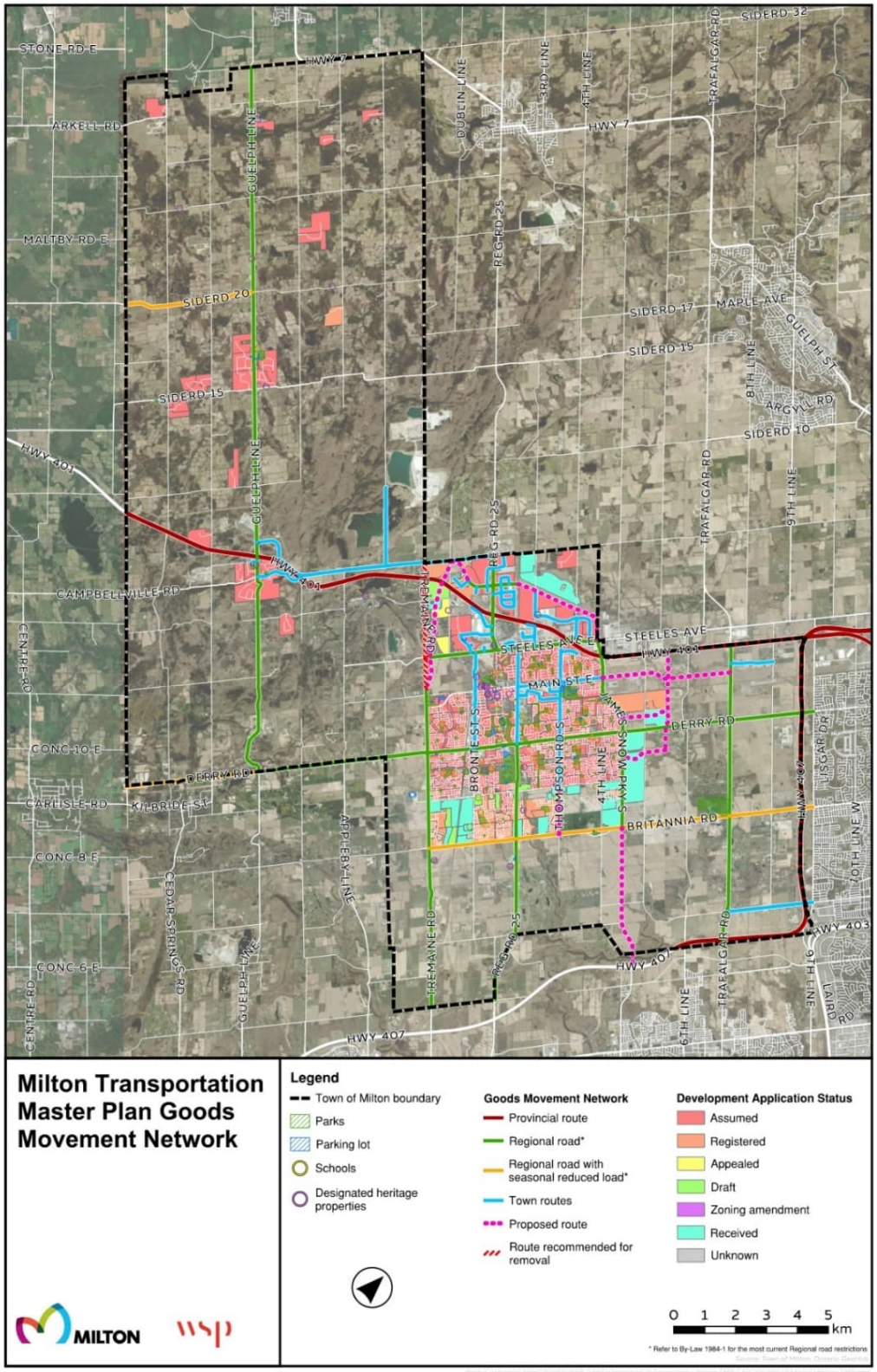
Goods movement is considered an integral part of the transportation system as well as shaping the local economy.

The proximity to the GTHA market has resulted in increasing levels of goods movement in Milton. Both national rail lines - Canadian National (CN) and Canadian Pacific Kansas City (CPKC) - serve Milton, with direct freight spurs available on select land parcels. CPKC's Expressway intermodal rail freight terminal is in Milton, offering national and cross-border truck/rail service. The CPKC Milton Expressway Terminal allows shippers to transfer their trailers on to intermodal trains operating on the corridor. The presence of this terminal and the quick access to Highway 407 and Highway 401 have contributed to the high truck movement on Trafalgar Road.

Britannia Road, James Snow Parkway, and Trafalgar Road are classified as regional major arterial roads and therefore experience substantial goods movement activity. The volume and proportion of existing heavy trucks within the BSPA is described in **Section 3.7**.

Figure 3.8 depicts the future goods movement routes.

Figure 3.8 Future Goods Movement Routes



Source: Milton TMP Update (2025)

3.5 Travel Characteristics

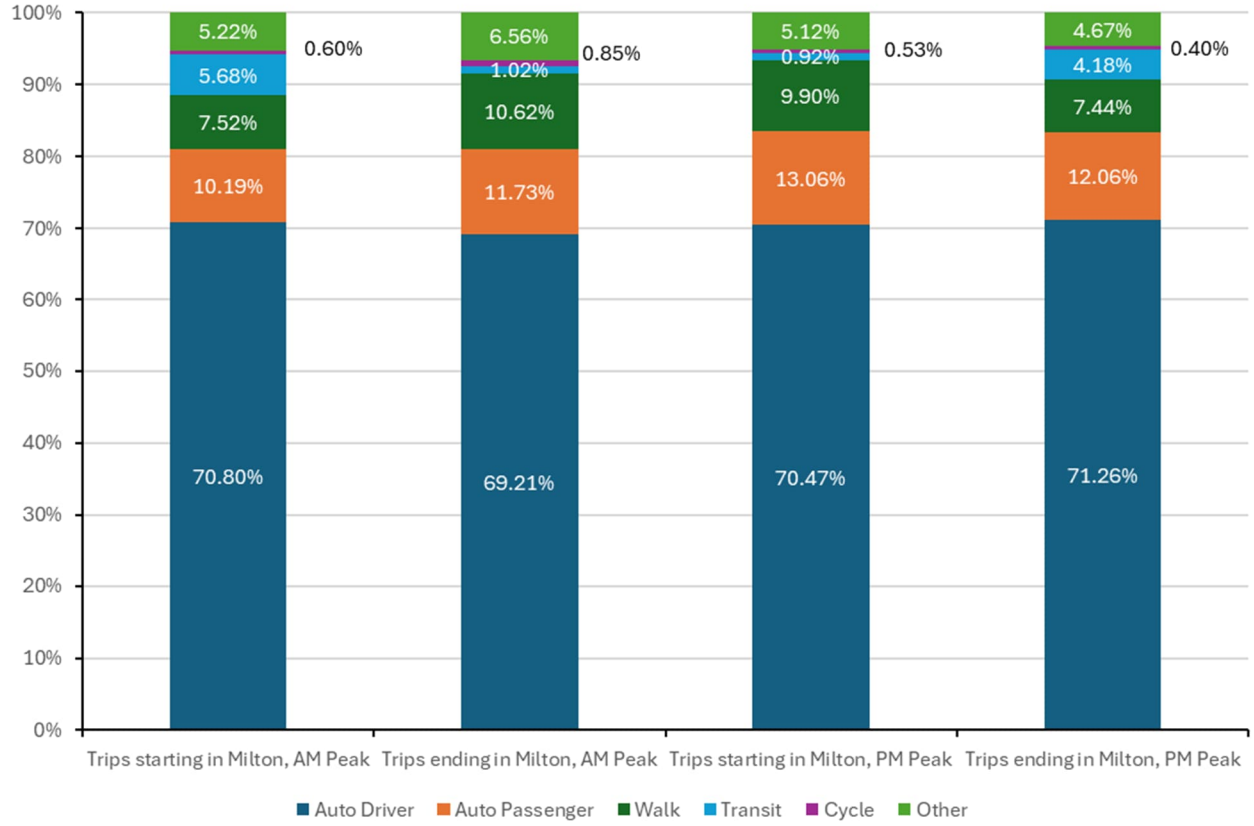
3.5.1 External Mode Split

The modal split for the BSPA is based on the 2016 Transportation Tomorrow Survey (TTS) data (as of the writing of this report, the 2022 TTS data had not been released). Appendix D shows the TTS data sheets queried for this study. The Town of Milton is defined as TTS planning district number 38, and its boundary is shown in **Figure 3.9**.

Figure 3.9 TTS Planning District 38

The percentage of trips completed by various modes in 2016 in the AM and PM peak periods is shown in **Figure 3.10**.

Figure 3.10 Mode Split - Milton



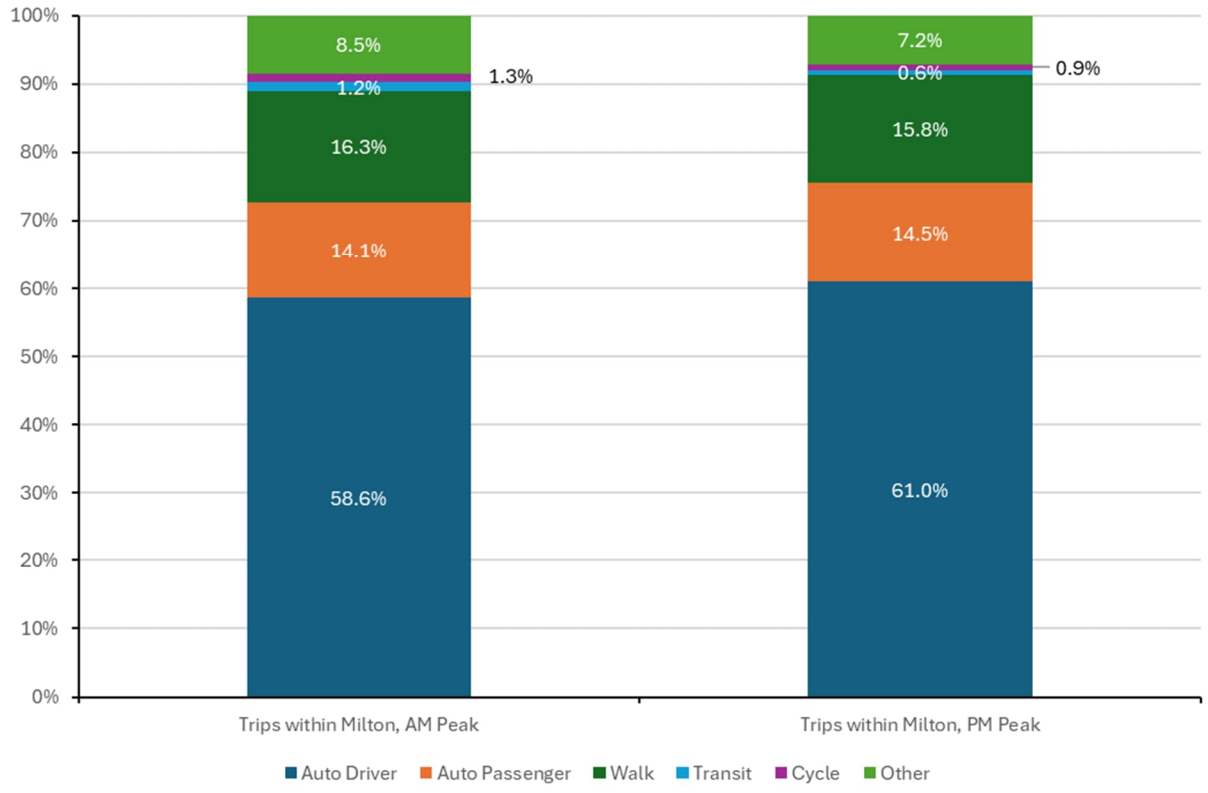
The modal split analysis shows a predominant use of single-occupancy vehicles (approximately 70%) during all peak periods, in and out of Milton. Approximately 5% of the total trips during the weekday a.m. peak period leaving Milton, and the p.m. peak period going into Milton, use transit. These transit users are primarily GO transit rail commuters.

Pedestrians make up around 7% to 10% percent of trips, and cyclists less than 1% during the peak periods. Modes categorized under other include mainly school bus, motorcycle, and paid rideshare trips.

3.5.2 Internal Mode Split

An analysis of the internal mode split shows the nature of trips both originating and ending within Milton during the weekday a.m. and p.m. peak periods as in **Figure 3.11**.

Figure 3.11 Internal Mode Split - Milton



The internal mode split analysis shows a majority of single-occupancy vehicle users (approximately 60%) for trips made within Milton. There are currently a small percentage of transit users (approximately 1%) and cyclists (approximately 1%) during the weekday a.m. and p.m. peak periods, while there is a higher proportion of trips made by foot (approximately 16%) during the weekday peak periods.

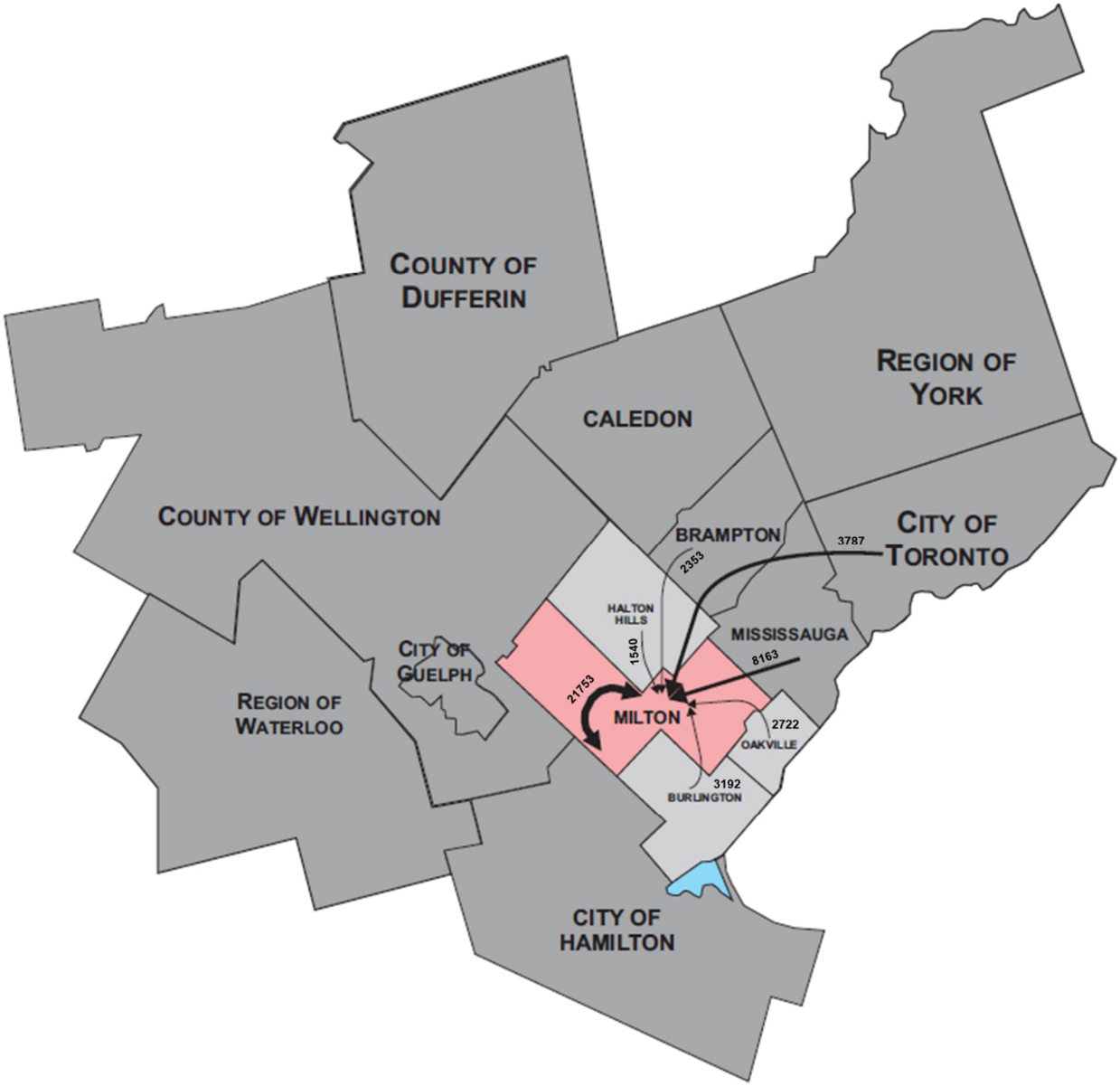
3.6 Existing Travel Demand and Travel Patterns

Commuting patterns demonstrate that many Milton residents work in communities to the east and south in the Town of Milton.

Figure 3.12 shows the top origins of trips made to Milton during the evening peak-travel period (from 3:00 to 7:00 p.m.). This suggests that after intra-city commuting, the top origins for trips destined for Milton include Mississauga, Toronto, Oakville, Brampton, Burlington, and Halton Hills.

It is noteworthy that during the afternoon peak-travel period, commuters travelling westbound into Milton tend to concentrate on Steeles Avenue, Highway 401, Derry Road, and Britannia Road.

Figure 3.12 Origins of Trips to Milton (PM Peak)



Source: Transportation Tomorrow Survey (2016)

Figure 3.13 demonstrates the proportional volumes of traffic on these east-west roads in relation to one another, denoted by the size of the arrows: Highway 401 ranks first, followed by Derry Road, Steeles Avenue, and Britannia Road.

Figure 3.13 Traffic flow Towards Milton on the East-West Corridor (PM Peak)

3.7 Existing Traffic Conditions

3.7.1 Existing Intersections

The existing traffic conditions analysis included 10 signalized intersections. The lane configurations of each of these intersections is outlined below and shown in **Figure 3.14**. The existing conditions analysis was completed in 2020; therefore, the lane configurations are based on the intersection geometries observed in 2020. In 2021, Britannia Road and Regional Road 25 was upgraded to include two left turn lanes in the eastbound and westbound directions.

1. Britannia Road and Regional Road 25 is a four-legged signalized intersection that consists of the following geometry in 2020:

- The northbound approach on Regional Road 25 consists of a left-turn lane, two through lanes, and a right-turn lane.
- The southbound approach on Regional Road 25 consists of a left-turn lane, two through lanes, and a right-turn lane.
- The eastbound approach on Britannia Road consists of a left-turn lane, two through lanes, and a right-turn lane.

- The westbound approach on Britannia Road consists of a left-turn lane, a through lane, and a shared through / right-turn lane.

2. Britannia Road and Thompson Road South / Third Line is a four-legged signalized intersection that consists of the following geometry in 2020:

- The northbound approach on Third Line consists of a shared left-turn / through / right-turn lane.
- The southbound approach on Thompson Road South consists of a shared left-turn / through / right-turn lane.
- The eastbound approach on Britannia Road consists of a left-turn lane and a shared through / right-turn lane.
- The westbound approach on Britannia Road consists of a left-turn lane and a shared through / right-turn lane.

3. Britannia Road and Fourth Line is a four-legged signalized intersection that consists of the following geometry in 2020:

- The northbound approach on Fourth Line consists of a shared left-turn / through / right-turn lane.
- The southbound approach on Fourth Line consists of a shared left-turn / through / right-turn lane.
- The eastbound approach on Britannia Road consists of a shared left-turn / through / right-turn lane.
- The westbound approach on Britannia Road consists of a shared left-turn / through / right-turn lane.

4. Britannia Road and James Snow Parkway is a three-legged signalized intersection that consists of the following geometry in 2020:

- The southbound approach on James Snow Parkway consists of a left-turn lane and right-turn lane.
- The eastbound approach on Britannia Road consists of a left-turn lane and a through lane.
- The westbound approach on Britannia Road consists of a through lane and a right-turn lane.

5. Britannia Road and Fifth Line is a four-legged signalized intersection that consists of the following geometry in 2020:

- The northbound approach on Fifth Line consists of a left-turn lane and a shared through / right-turn lane.
- The southbound approach on Fifth Line consists of a left-turn lane and a shared through / right-turn lane.
- The eastbound approach on Britannia Road consists of a left-turn lane and a shared through / right-turn lane.
- The westbound approach on Britannia Road consists of a left-turn lane and a shared through / right-turn lane.

6. Britannia Road and Sixth Line is a four-legged signalized intersection that consists of the following geometry in 2020:

- The northbound approach on Sixth Line consists of a shared left-turn / through / right-turn lane.
- The southbound approach on Sixth Line consists of a shared left-turn / through / right-turn lane.

- The eastbound approach on Britannia Road consists of a shared left-turn / through / right-turn lane.
- The westbound approach on Britannia Road consists of a shared left-turn / through / right-turn lane.

7. Britannia Road and Trafalgar Road is a four-legged signalized intersection that consists of the following geometry in 2020:

- The northbound approach on Trafalgar Road consists of a left-turn lane, a through lane, and a shared through / right-turn lane.
- The southbound approach on Trafalgar Road consists of a left-turn lane, a through lane, and a shared through / right-turn lane.
- The eastbound approach on Britannia Road consists of a left-turn lane, a through lane, and a shared through / right-turn lane.
- The westbound approach on Britannia Road consists of a left-turn lane, a through lane, and a shared through / right-turn lane.

8. James Snow Parkway and Louis St. Laurent Avenue is a three-legged signalized intersection that consists of the following geometry in 2020:

- The northbound approach on James Snow Parkway consists of a left-turn lane and two through lanes.
- The southbound approach on James Snow Parkway consists of a through lane and shared through / right-turn lane.
- The eastbound approach on Louis St. Laurent Avenue consists of two left-turn lanes and a right-turn lane.

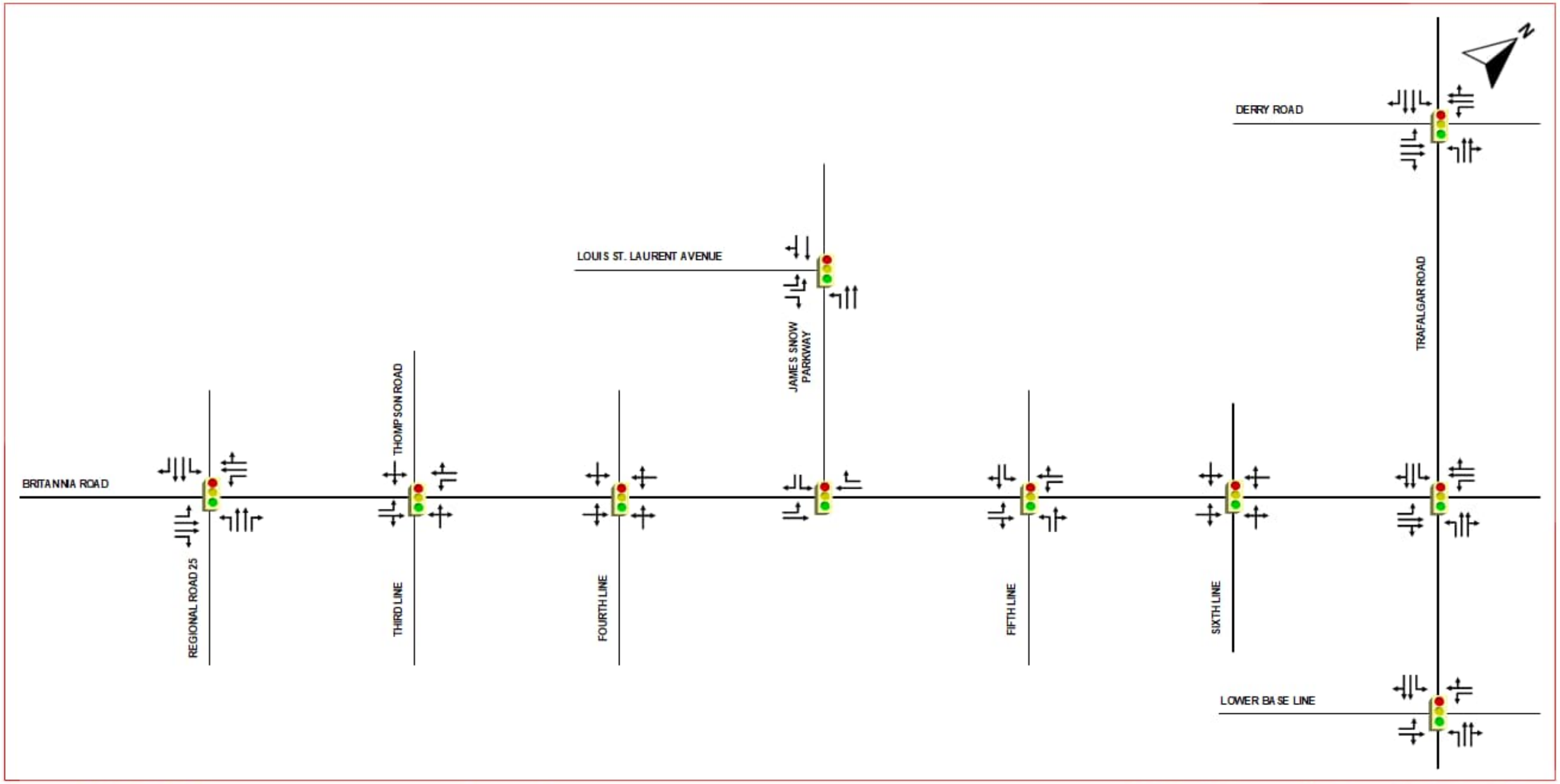
9. Trafalgar Road and Derry Road is a four-legged signalized intersection that consists of the following geometry in 2020:

- The northbound approach on Trafalgar Road consists of a left-turn lane, a through lane, and a shared through / right-turn lane.
- The southbound approach on Trafalgar Road consists of a left-turn lane, two through lanes, and a right-turn lane.
- The eastbound approach on Derry Road consists of a left-turn lane, two through lanes, and a right-turn lane.
- The westbound approach on Derry Road consists of a left-turn lane, a through lane, and a shared through / right-turn lane.

10. Trafalgar Road and Lower Base Line is a four-legged signalized intersection that consists of the following geometry in 2020:

- The northbound approach on Trafalgar Road consists of a left-turn lane, a through lane, and a shared through / right-turn lane.
- The southbound approach on Trafalgar Road consists of a left-turn lane, a through lane, and a shared through / right-turn lane.
- The eastbound approach on Lower Base Line consists of a left-turn lane and a shared through lane / right-turn lane.
- The westbound approach on Lower Base Line consists of a left-turn lane and a shared through lane / right-turn lane.

Figure 3.14: Existing Intersection Lane Configurations (2020)



3.7.2 Existing Traffic Data

Existing turning movement counts (TMCs) and signal timing plans were obtained from the Region for the weekday a.m. and p.m. peak periods. Under normal circumstances, traffic analyses that are more than two years old for existing conditions would benefit from new traffic data. However, given the irregular traffic volumes experienced at the time of the writing of the first TMP for the BSPA due to the COVID-19 global pandemic, new TMCs would not have reflected typical traffic conditions that were experienced pre-pandemic. The data used for the traffic analyses were the best available data at the time of the original report, and new data was not collected for this 2025 version of the BSPA TMP. It is expected that new data could be collected to support development-specific applications, in line with the Region's and Town's Transportation Impact Study (TIS) Guidelines.

A summary of the intersection TMC collection dates and peak hours are provided in **Table 3.1**. The TMCs provided by the Region were collected in three separate years, 2017, 2018 and 2019, as well as during different seasons. The TMC data is provided in **Appendix A-1** and the signal timing plans are provided in **Appendix A-2**.

Table 3.1: Intersection Turning Movement Count Details

No.	Intersection	TMC Count Date	Peak Hours	
			AM Peak	PM Peak
1	Britannia Road and Regional Road 25	December 9, 2019	7:30-8:30	4:15-5:45
2	Britannia Road and Thompson Road South / Third Line	November 7, 2019	7:00-8:00	4:30-5:30
3	Britannia Road and Fourth Line	November 7, 2019	7:15-8:15	4:45-5:45
4	Britannia Road and James Snow Parkway	November 7, 2019	7:15-8:15	5:00-6:00
5	Britannia Road and Fifth Line	May 3, 2018	7:45-8:45	4:45-5:45
6	Britannia Road and Sixth Line	April 19, 2018	7:45-8:45	5:00-6:00
7	Britannia Road and Trafalgar Road	November 6, 2019	7:30-8:30	4:45-5:45
8	James Snow Parkway and Louis St. Laurent Avenue	May 1, 2018	7:30-8:30	5:00-6:00
9	Trafalgar Road and Derry Road	November 5, 2019	7:15-8:15	4:45-5:45
10	Trafalgar Road and Lower Base Line	June 5, 2017	7:30-8:30	4:45-5:45

3.7.3 Existing Traffic Volumes

The traffic analyses have been conducted in accordance with Halton Region's Transportation Impact Study (TIS) Guidelines, dated January 2015. The general approach for adjusting the existing traffic conditions was to balance volumes at adjacent intersections to adjust for variabilities in the count year and seasonality.

The general approach for adjusting the existing traffic conditions was to grow the existing data to the current year (January 2020 – accounting for pre-COVID-19 conditions) and balance volumes at adjacent intersections to adjust for variabilities in the count year and seasonality.

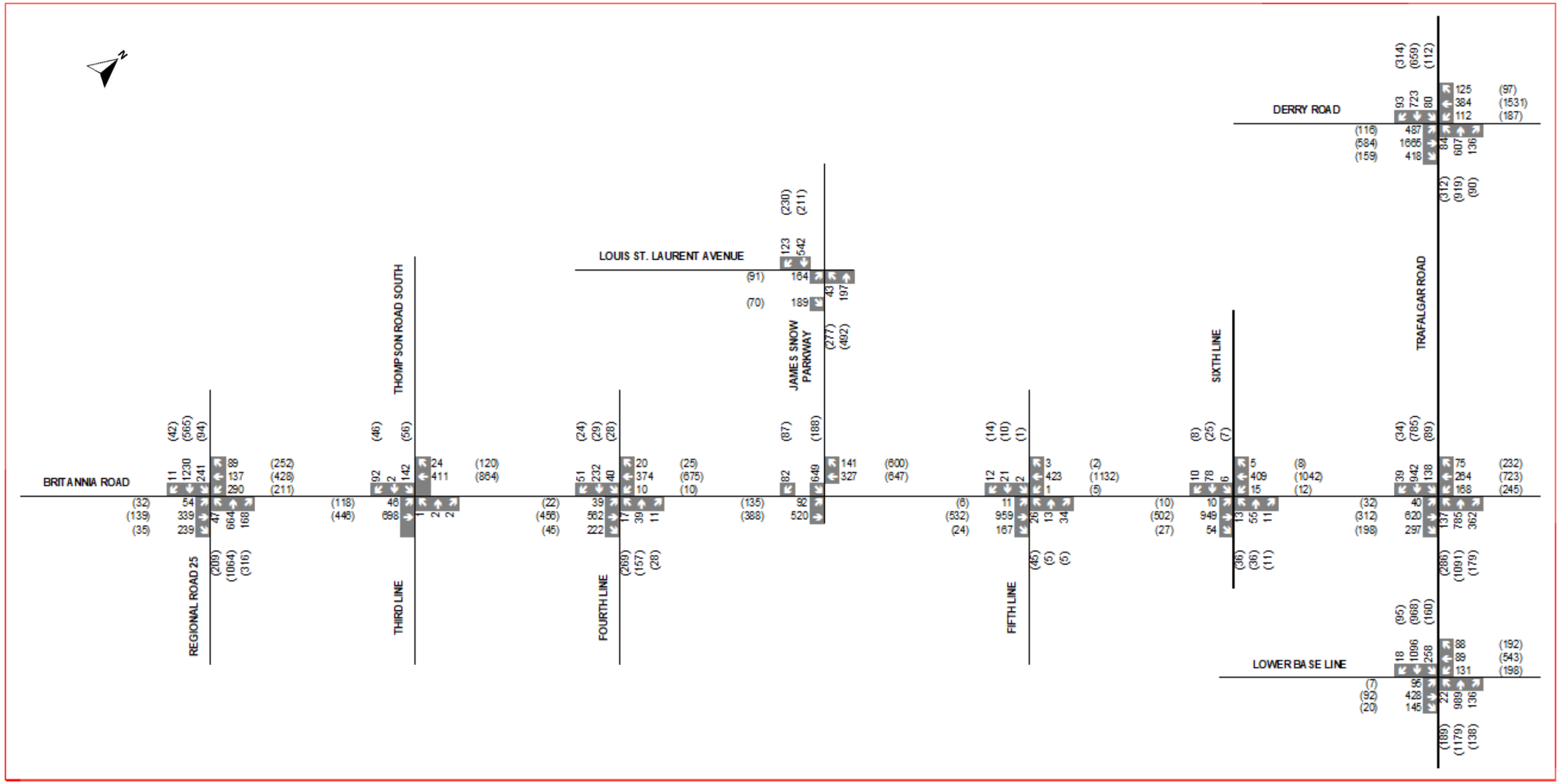
To adjust the raw 2018 and 2019 traffic counts, historic data was analyzed to determine the growth rates on Britannia Road. Counts received from the Region included:

- An 8-hour turning movement count at Britannia Road and Trafalgar Road in June 2013.
- A 24-hour tube count on Britannia Road between Sixth Line and Trafalgar Road in June 2018.
- An 8-hour turning movement count at Britannia Road and Trafalgar Road in November 2019.

The same 8 hours of traffic were compared to monitor growth on Britannia Road. Both the compounded and linear growth rates calculated resulted in no growth or negative growth rates for the years of historic data provided. For a conservative estimate of growth, a growth rate of 0.5 percent was used for all movements at all intersections in the study area for the existing conditions.

For a conservative estimate, the existing traffic volumes were balanced to be within plus or minus five percent of adjacent intersection traffic. Balancing was conducted by increasing the older 2017 and 2018 count volumes to align with the more recent 2019 counts. The five percent threshold was used because of the limited access and rural land use along Britannia Road and James Snow Parkway between the intersections. **Figure 3.15** shows the existing 2020 balanced traffic volumes. The existing traffic operations results and existing queuing results may be overstated given the conservative volume balancing approach.

Figure 3.15: Existing 2020 Balanced Traffic Volumes



3.7.4 Model Calibration and Methodology for Existing Conditions

The traffic models were calibrated according to the Region's TIS Guidelines. The following measures were implemented in Synchro to calibrate the traffic model for the existing conditions analysis:

- Saturation flow rates were set to the Synchro default of 1,900 vehicles per hour per lane.
- The lane width was set to the Synchro default of 3.7 metres.
- The heavy vehicle percent used was from the TMC counts with a minimum of two percent (Synchro default) for a conservative analysis.
- The existing signalized intersections operate where the pedestrian phase is called only if a pedestrian activates the crossing. Given the current rural land use, lack of pedestrian connectivity and minimal pedestrian demand, the pedestrian phasing was removed from the model to more accurately represent how the intersection operates without pedestrians crossing.

Additional calibration measures such as optimizing signal timing plans and implementing lost time adjustments used to calibrate the existing traffic models are described in the following subsections.

The applied modelling inputs and adjustments under existing conditions and future conditions were tuned for model calibration at the Secondary Plan level. In the future, more detailed transportation studies (Tertiary Plans, site-specific TIS's) will need to confirm modeling inputs with Halton Region staff.

Optimizing Signal Timing Plans

When the provided existing signal timing plans were combined with the existing traffic volumes in Synchro, there were several movements at most of the intersections that were operating over capacity. This is not possible under existing conditions as this would mean that some vehicles could not clear the intersection, but all the vehicles counted have cleared the intersection. For this study, when possible, phasing splits and cycle lengths were optimized and adjusted for some intersections to reduce v/c for each movement to be within acceptable range. This included the optimization and coordination of the signals along Britannia Road and James Snow Parkway. The Region advised that they regularly review and update their signal timing plans to accommodate the most current traffic volumes, and that optimizing signal timing plans under existing conditions would be acceptable to calibrate the traffic model for a Secondary Plan level study. More detailed studies should conform to the current version of the Regional Synchro Guidelines.

Lost Time Adjustment

Lost Time Adjustment factors were also used under the existing conditions analysis as part of model calibration. Total lost time represents the time that is not usable by vehicles for a signal phase. It is the sum of the start-up lost time at the beginning of each green period and a portion of each clearance interval (yellow plus all-red time). Start-up lost time occurs at the beginning of the cycle when the traffic signal changes from red to green; it is the time that elapses between the signal changing and the queued vehicles moving through the intersection. The extension of effective green is the time that vehicles continue to pass through the intersection after the yellow interval begins. Total lost time is calculated via the following formula:

$$Total\ Lost\ Time = Yellow\ plus\ All\ Red\ Time + Start\ Up\ Lost\ Time - Extension\ of\ Effective\ Green$$

It is typical driver behaviour in the Greater Toronto Area (GTA) to treat a portion or even all of the yellow time as green time, entering the intersection during the yellow interval, which impacts the intersection capacity. The Lost Time Adjustment (LTA) parameter in Synchro, defined as the following formula, is used in estimating the overall capacity of the intersection:

$$Lost\ Time\ Adjustment = Start\ Up\ Lost\ Time - Extension\ of\ Effective\ Green$$

The default start-up lost time and extension of effective green time are both 2.0 seconds according to the Highway Capacity Manual (HCM). This explains the default LTA of zero seconds.

Recognizing that the extension of effective green is increased when motorists enter the intersection during the yellow time, several municipalities, including York Region, Niagara Region, the City of Mississauga and the City of Toronto, recognize these driver behaviours and include recommendations for applying LTA to reflect these conditions within their TIS guidelines. Although this driver behaviour is not limited to only locations or time periods that experience traffic congestion, in the interest of providing a more conservative analysis, LTA was only applied to the three critical intersections based on the Region's criteria.

Also, as the length of clearance interval (yellow plus all-red time) increases for a phase, the extension of effective green time increases. However, as a rule of thumb, the maximum extension of effective green does not exceed the yellow interval time.

Therefore, a lost time adjustment of -1.0 second was applied to left-turn movements and -2.0 seconds for through movements at these intersections, considering the typical yellow interval of 3.0 seconds for a left-turn phase and 4.0 seconds for a through movement phase.

Peak Hour Factors

The 15-minute volume breakdown was only provided for the turning movement counts at Britannia Road at Trafalgar Road, Trafalgar Road at Derry Road, and Trafalgar Road at Lower Base Line; therefore, the peak hour factor (PHF) was only known for these three intersections. The PHF at Britannia Road and Trafalgar Road was used for the remainder of intersections due to the proximity to Britannia Road. **Table 3.2** shows the PHF for each intersection in the weekday a.m. and p.m. peaks.

Table 3.2: Existing Conditions Modeled Peak Hour Factors

No.	Intersection	PHF	
		AM Peak	PM Peak
1	Britannia Road and Regional Road 25	0.97	0.97
2	Britannia Road and Thompson Road South / Third Line	0.97	0.97
3	Britannia Road and Fourth Line	0.97	0.97
4	Britannia Road and James Snow Parkway	0.97	0.97
5	Britannia Road and Fifth Line	0.97	0.97

No.	Intersection	PHF	
		AM Peak	PM Peak
6	Britannia Road and Sixth Line	0.97	0.97
7	Britannia Road and Trafalgar Road	0.97	0.97
8	James Snow Parkway and Louis St. Laurent Avenue	0.97	0.97
9	Trafalgar Road and Derry Road	0.98	0.95
10	Trafalgar Road and Lower Base Line	0.99	0.94

The PHF values were assumed based on existing observed PHFs at adjacent intersections.

Level of Service Criteria

The traffic operational analysis was conducted using the Synchro version 11 software. The intersection capacity analysis was based on volume-to-capacity (v/c) ratios and level of service (LOS). LOS is a measure of driver discomfort and frustration, fuel consumption, and lost travel time defined in terms of delay. The LOS categories and delay criteria for signalized and unsignalized intersections are summarized in **Table 3.3** and defined in **Appendix B**. The v/c ratio and LOS are determined using the Synchro methodology and the overall intersection v/c is determined using the Highway Capacity Manual (HCM) 2000 since it is not provided by Synchro. The queueing analysis is based on the 95th percentile queues using Synchro's methodology.

Table 3.3: Level of Service Criteria (based on Synchro Methodology)

Level Of Service (LOS)	Average Control Delay (seconds / vehicle)	
	Signalized	Unsignalized
A	≤ 10	≤ 10
B	> 10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E	> 55 and ≤ 80	> 35 and ≤ 50
F	> 80	> 50

The Region's Transportation Impact Study guidelines identify intersection capacity and queueing criteria to assess the operational performance of each intersection and identify whether mitigations should be considered to reduce operational impacts. The criteria for unsignalized and signalized intersections are as follows:

- Signalized Intersections:
  - V/C ratios of 0.85 or above for overall intersection operations, through movements, or shared through/turning movements.
  - V/C ratios of 0.95 or above for exclusive movements.
  - Queues for an individual movement are projected to exceed available turning lane storage.
- Unsignalized Intersections:
  - LOS, based on average delay for individual movements, exceeds LOS D.
  - The estimated 95th percentile queue length for an individual movement is projected to exceed the available turning lane storage.

Section 3.7.5 and **Section 3.7.6** show the existing capacity and queueing analysis results for the BSPA intersections that were assessed using the criteria noted above.

3.7.5 Intersection Capacity Analysis

The existing conditions intersection capacity analysis includes a summary of the overall intersection and critical movement operations, with a focus on performance measures such as LOS, v/c ratios and delay. The overall and critical movements are summarized in **Table 3.4**; detailed Synchro output sheets for the existing conditions are provided in **Appendix C**. Existing traffic operations and queuing results may be overstated given the conservative volume balancing approach taken.

The existing conditions intersection capacity analysis results show that most intersections are operating below or at capacity during the a.m. and p.m. peak hours. The following intersections are forecast to operate with v/c ratios greater than 0.85 (the Region's criteria for identifying impact mitigations) for the existing conditions:

- **Britannia Road and Trafalgar Road:** The intersection of Britannia Road and Trafalgar Road has an overall intersection v/c ratio of 0.85 in the weekday a.m. peak and 0.82 in the weekday p.m. peak. During the weekday a.m. peak, the eastbound through-right movement exceeds the Region's criteria with v/c ratios of 0.90.
- **Trafalgar Road and Derry Road:** The intersection of Trafalgar Road and Derry Road has an overall intersection v/c ratio of 0.91 in the weekday a.m. peak and 1.03 in the weekday p.m. peak, which exceeds the Region's criteria of 0.85. The weekday a.m. peak eastbound through, northbound through, and southbound through movements exceed the Region's criteria with v/c ratios of 0.95, 0.94, and 0.93, respectively. The weekday p.m. peak northbound left, westbound through, northbound through, and southbound through movements also exceed the Region's criteria with v/c ratios of 1.05, 1.01, 0.97, and 0.87, respectively.
- **Trafalgar Road and Lower Base Line:** The intersection of Trafalgar Road and Lower Base Line has an overall intersection v/c ratio of 0.96 in the weekday a.m. peak and 1.02 in the weekday p.m. peak, which exceeds the Region's criteria of 0.85. The weekday a.m. peak eastbound through, and northbound through movements exceed the Region's criteria with v/c ratios of 1.03, and 0.90, respectively. The weekday p.m. peak westbound through, and northbound through movements also exceed the Region's criteria with v/c ratios of 0.99, and 0.98, respectively.

Table 3.4: Intersection Capacity Analysis – Existing Conditions with Optimization

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	Overall V/C* Max V/C Through LOS (Delay in Seconds)	Critical Movement (V/C) (LOS)	Overall V/C* Max V/C Through LOS (Delay in Seconds)	Critical Movement (V/C) (LOS)
1. Britannia Road and Regional Road 25	Overall 0.77 SBT (0.75) C (31)	-	Overall 0.73 NBT (0.76) C (21)	-
2. Britannia Road and Thompson Road South / Third Line	Overall 0.76 SBT (0.85) B (17)	-	Overall 0.76 WBT (0.83) B (13)	-
3. Britannia Road and Fourth Line	Overall 0.78 SBT (0.77) C (25)	-	Overall 0.81 NBT (0.80) C (29)	-
4. Britannia Road and James Snow Parkway	Overall 0.76 EBT (0.63) C (31)	-	Overall 0.62 WBT (0.63) B (19)	-
5. Britannia Road and Fifth Line	Overall 0.72 EBT (0.82) B (11)	-	Overall 0.72 WBT (0.80) A (8)	-
6. Britannia Road and Sixth Line	Overall 0.77 EBT (0.79) B (10)	-	Overall 0.79 WBT (0.80) A (9)	-
7. Britannia Road and Trafalgar Road	Overall 0.85 EBT (0.90) D (39)	EBT/R (0.90) (D)	Overall 0.82 NBT (0.79) C (34)	-
8. James Snow Parkway and Louis St. Laurent Avenue	Overall 0.32 SBT (0.43) B (12)	-	Overall 0.39 NBT/SBT (0.22) A (9)	-
9. Trafalgar Road and Derry Road	Overall 0.91 EBT (0.95) D (39)	EBT (0.95) (D) NBT/R (0.94) (E) SBT (0.93) (E)	Overall 1.03 WBT (1.01) E (60)	WBT/R (1.01) (E) NBL (1.05) (F) NBT/R (0.97) (E) SBT (0.87) (E)
10. Trafalgar Road and Lower Base Line	Overall 0.96 EBT (1.03) D (44)	EBT/R (1.03) (F) NBT/R (0.90) (D)	Overall 1.02 WBT (0.99) D (50)	WBT/R (0.99) (E) NBT/R (0.98) (E)

Notes: NB = northbound; SB = southbound; EB = eastbound; WB = westbound; L= left; T = through; R = right

**Overall intersection v/c from HCM 2000 methodology. Individual movement results from Synchro. Results in red text represent overall intersections or movements that meet the Region's criteria for considering mitigation strategies to reduce impacts to operations.*

3.7.6 Queueing Analysis

The queueing results from the Synchro model were summarized for exclusive movements with storage lanes to determine whether the storage lengths can accommodate the existing queues. The available storage lengths for exclusive turn lanes were measured as the lane width from the stop bar to the start of the taper. The 95th percentile queues are provided in **Table 3.5.** No movements had 95th percentile queues exceeding the available storage lengths except for the northbound left at Trafalgar Road and Derry Road, which exceeded the storage lane by 35 metres. Queues for all movements can be found in the Synchro output sheets, which are provided in **Appendix C**.

Table 3.5: Intersection Queueing Analysis – Existing Conditions with Optimization

Intersection	Turning Movement	Available Storage Lengths (m)	95th Percentile Queue (m)	
			A.M. Peak Hour	P.M. Peak Hour
1. Britannia Road and Regional Road 25	EBL	142	22	13
	EBR	89	#47	0
	WBL	147	#96	#71
	NBL	120	#23	#57
	NBR	132	15	14
	SBL	120	#82	#31
	SBR	115	0	0
2. Britannia Road and Thompson Road South / Third Line	EBL	130	4	6
	WBL	85	1	1
3. Britannia Road and Fourth Line	N/A	N/A	N/A	N/A
4. Britannia Road and James Snow Parkway	EBL	130	27	44
	WBR	95	13	22
	SBL	230	155	57
5. Britannia Road and Fifth Line	EBL	125	1	0
	WBL	135	1	1
	NBL	122	12	19
	SBL	125	2	3
6. Britannia Road and Sixth Line	N/A	N/A	N/A	N/A
7. Britannia Road and Trafalgar Road	EBL	50	16	#21
	WBL	90	#55	66
	NBL	165	31	56
	SBL	140	#47	21
8. James Snow Parkway and Louis St. Laurent Avenue	EBR	140	13	8
	NBL	115	5	24

Intersection	Turning Movement	Available Storage Lengths (m)	95th Percentile Queue (m)	
			A.M. Peak Hour	P.M. Peak Hour
9. Trafalgar Road and Derry Road	EBL	130	84	#56
	EBR	110	41	13
	WBL	300	#26	41
	NBL	110	24	#145
	SBL	130	23	#47
	SBR	85	3	85
10. Trafalgar Road and Lower Base Line	EBL	90	27	5
	WBL	120	27	48
	NBL	170	6	#67
	SBL	170	#80	#60

Note: # - Volume for the 95th percentile cycle exceeds capacity; N/A – No storage lanes at the intersection; Results in red text represent 95th percentile queues that exceed the storage lane.

3.8 Public Information Centre #1

Consultation is essential to developing the transportation network for the BSPA and is part of the Municipal Class Environmental Assessment process. The first round of consultation presented the existing conditions and gathered public feedback on key issues and considerations for the study. This section summarizes the first round of engagement, with a focus on transportation-related comments.

A newspaper advertisement, a notice on the Town's website, a section dedicated to the project on the Let's Talk Milton engagement platform, social media, an e-newsletter, and digital screens throughout Milton all were used to announce the project and begin to generate dialogue about the outcomes. Due to the COVID-19 pandemic, all engagement during the first round was virtual and online, including the online Public Information Centre held on March 11, 2021.

Transportation-specific comments received over the course of consultation included:

- Has traffic analysis looked at the potential impact of the CN hub at Tremaine Road and Britannia on the traffic in the eastern section of Britannia through this Secondary Plan?
- Is the possibility of a regional transportation spine along Trafalgar Road being considered to provide active transportation to this area?
- Do you have planning ideas that would provide people with an opportunity to eliminate private car usage?
- One of the challenges of a walkable community is road design. The design and construction of regional roads seems counterproductive to this vision.
- Britannia Road should be designed with multi purpose paths and transit to allow for more active transportation.
- By reducing car dependency, then you could greatly reduce the amount of asphalt needed for driving and parking, and thereby increase the density.

- It may be worth considering a bike share program like they have in Toronto for the Town of Milton.
- A transit hub with synchronized access to multiple neighbouring cities, both east and west, so instead of driving everywhere we could easily commute to Mississauga, Burlington, or other GO Stations.
- Metrolinx recently released a supportive “Initial Business Case” for a new GO Station at Derry and Trafalgar – which is a really positive first step in getting an additional station in Milton.
- Streetsville had all the shops and restaurants in place and a lot of the housing built around that area as well as historical buildings mixed in. In Milton, I think we plan the roads better, but I like the feel of the area.
- Increased transit accessibility is necessary. Milton needs to prioritize a transit-oriented development and human-scale neighbourhoods to shift from the private methods of transit to a more transit-friendly environment.
- Having more mixed-housing options and protected green space would benefit the community. This should include rent-to-own housing and rent geared to income housing. Having better public transit in newer areas should also be a priority, with housing being built with energy efficiency practices. Additionally, more parkland and wooded areas would be beneficial.
- Having better transit and a greater number of walking and biking paths would help increase connectivity throughout the community. Additionally, having parks spread throughout the community would provide space to socialize and exercise outdoors.

These comments were considered during the multi-modal transportation planning exercises that were undertaken in the identification of transportation challenges and opportunities and the development of alternative solutions for the BSPA.

4 Identification and Assessment of Future Alternatives

4.1 Opportunity Statement

The Town of Milton wishes to set in place a planning framework to guide development within the BSPA to accommodate a population of approximately 57,500 residents and 9,300 jobs by the year 2051. The existing road network, transit connectivity, and active transportation network need to be enhanced to help facilitate this level of development. The secondary planning exercise is an opportunity to plan and implement an efficient multi-modal transportation solution to support the development within the BSPA.

4.2 Vision and Transportation Goals for Britannia

The BSPA is envisioned to be a complete, sustainable, connected, attractive and well-serviced community. It will be comprised of complete and walkable residential neighbourhoods that provide a range and mix of housing options and access to amenities.

One of the goals related to transportation includes providing a connected community through mobility options and a logical road network. The key transportation planning guidelines followed in the design of the road network are:

- Realize a network of streets that balance the needs of all road users, including pedestrians, cyclists, transit users, and motorists.
- Identify a system of collector roads that provide connectivity within the Secondary Plan and other areas of the Town.
- Plan for a local transit network that can support connections to the broader and higher-order regional transit system.
- Ensure neighbourhoods are designed to be accessible by all, regardless of age or physical ability.
- Foster a connected and accessible on- and off-road pedestrian and cycling path network connected to key community destinations which promotes a culture of active transportation.
- Identify Britannia Road and James Snow Parkway as key regional corridors that link people to existing and planned regional destinations and abutting municipalities.

4.3 Alternative Solutions

Phase 2 of the Municipal EA process requires identifying alternative solutions to fulfill the vision and the objectives of the TMP. The alternative solutions for the BSPA include road, trail/multi-use path and cycling networks based on land area designations, feedback from the residents, landowners and other stakeholders, and the Town's future plans for the BSPA. A total of three alternative options were developed and analyzed. A final preferred option was developed based on the feedback received on the initial three options.

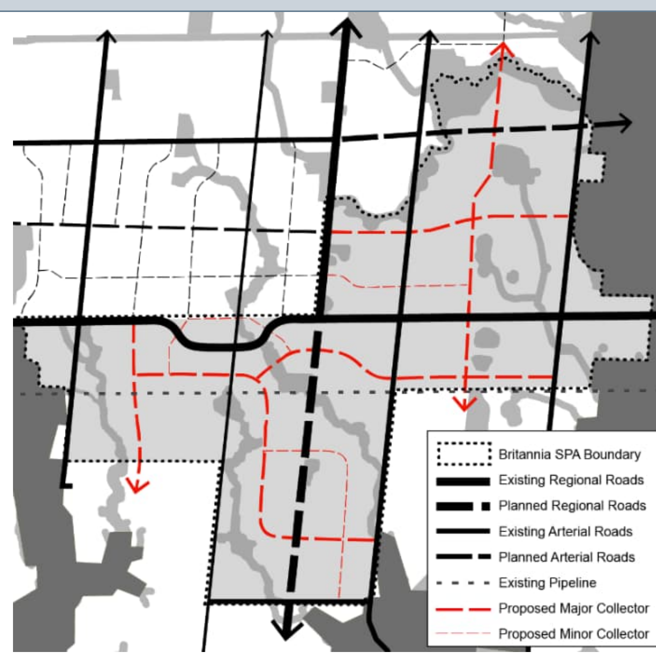
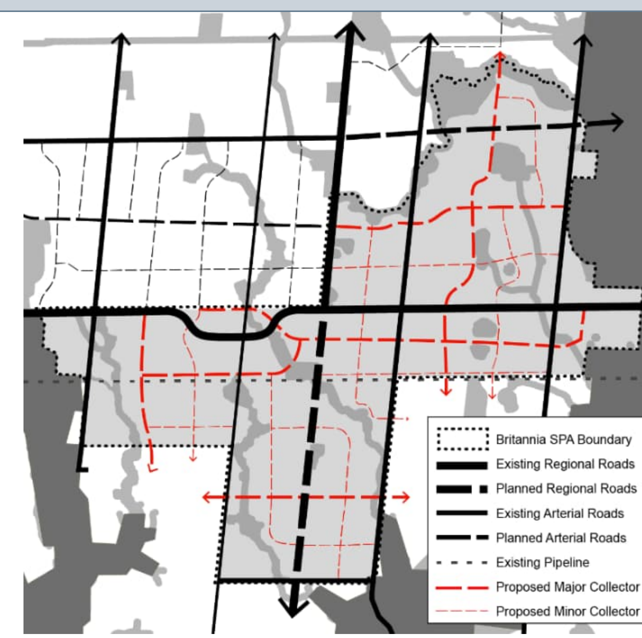
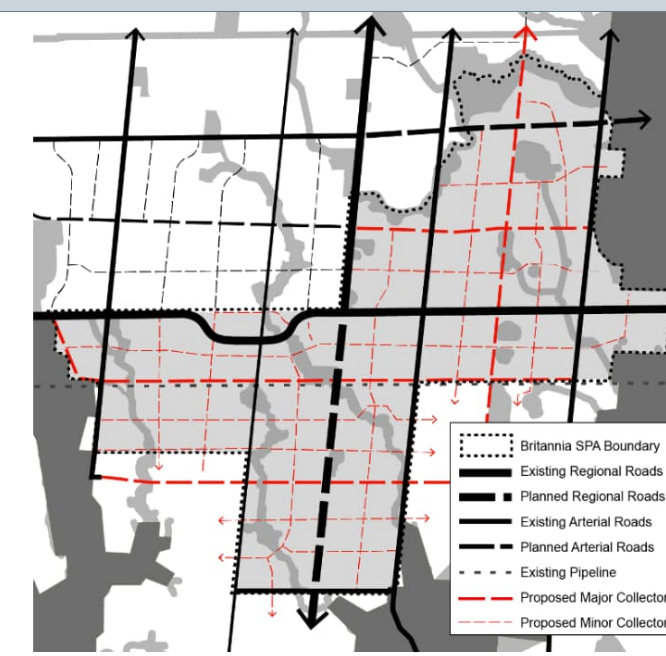
There are several common characteristics that can be found in all alternative options which align with the vision of the Secondary Plan:

- Developing an active transportation network such as cycling facilities and an off-road trail/multi-use path network connected to existing Town facilities.
- Forming neighbourhood nodes that are mixed-used centres with commercial and residential buildings and that are accessible through transit, walking, and cycling.

The street network (as well as active transportation network, as it is provided in the street right-of-way) differs in the three options, with the level of street network connectivity increasing from Alternative 1 to Alternative 3. There are trade-offs with street connectivity, however, as the number of crossings of the NHS also increases from Alternative 1 to Alternative 3.

A comparison of the characteristics of the three alternative options is shown in **Table 4.1**. These three alternatives were considered for their technical merits and presented to stakeholders and the public to gain feedback to help determine the preferred land use plan and associated transportation network.

Table 4.1: Characteristics of Alternative Options

	Alternative Option 1: Nodes and Corridors	Alternative Option 2: 15-Minute Neighbourhood	Alternative Option 3: Integrated Blocks & Squares
Character and Identity	Transit-oriented with a focus on the Regional Corridors.	Six (6) “15-minute neighbourhoods” focused on retail nodes. Regional Corridors varying in conditions and appearance.	22 “blocks” organized on a 5 minute walk to a square / neighbourhood focal point. Character varies as each square and block establish a unique form and function.
Housing	Medium Density residential concentrated along Regional Corridors. Low Density residential internal.	Medium Density residential is focused and internal to neighbourhood.	Residential density is integrated throughout each block and street. Encourages intermixing compatible residential unit types.
Retail	One large Major Retail Node at the Regional Corridor intersection, supported by Local Retail Nodes spaced at approximately 20-minute walk intervals along the Regional Corridors.	One smaller Major Retail Node at southwest corner of regional crossroads. More internal Local Retail Nodes to provide walkability.	Neighbourhood Focal Points permit small-scale retail and service commercial uses. Supported by more traditional retail nodes.
Parks	3 District Parks and 6 Neighbourhood Parks dispersed evenly. No squares.	2 District Parks and 8 Neighbourhood Parks. Squares used where access to parks is limited.	17 Squares, 4 Neighbourhood Parks and a central Community Park ensure access to green space for all residents within a 5 minute walk.
Schools	2 High Schools and 10 Elementary Schools adjacent to parks where possible.	2 High Schools and 10 Elementary Schools adjacent to parks where possible.	2 High Schools and 10 Elementary Schools adjacent to squares, where possible.
Places of Worship	3 new Places of Worship located along Regional Corridors.	3 new Places of Worship located near nodes.	3 new Places of Worship located within or near Neighbourhood Focal Points with arterial access.
Active Transportation	High reliance on off-road trails, pathways, and linkages through the NHS to increase connectivity.	Combination of on- and off-road trails and pathways. Heavy reliance on NHS linkages to continue grid network.	Primarily deployed on-street given high connectivity of the grid system.
Street Network	Curvilinear grid. Avoidance of NHS crossings. Low grid connectivity and intersection density. Primarily Major Collectors. Clear hierarchy of Collectors. 	Modified grid network. Strategic NHS crossings. Medium grid connectivity and intersection density. Equal balance of collectors. Clear hierarchy of Collectors. 	Strong grid. Numerous NHS crossings. High connectivity and intersection density. Greater use of minor collectors. Collector hierarchy is similar. 

4.4 Public Information Centre #2

Public Information Centre (PIC) #2 was held on July 7, 2021, virtually via Zoom due to the COVID-19 pandemic.

The purpose for PIC #2 was to provide the opportunity for the public to comment on the land use and transportation options (identified in **Table 4.1**) as input into the preparation of a preferred land use option for the Britannia Secondary Plan. The responses received from PIC #2 provided valuable insight on the key elements of the Land Use options that the public would like to see represented in the final Britannia Secondary Plan. Key takeaways from the engagement session, as well as continued input from stakeholders, were later used in the drafting of the preferred land use plan and identifying policies for the Britannia Secondary Plan.

4.5 Public Information Centre #3

PIC#3 was held at Milton Town Hall on Tuesday, July 30, 2024, from 7 to 9pm. The purpose of the meeting was to update attendees on progress on the Secondary Plan, given the increase in projected population and employment to the horizon year 2051.

A formal presentation was made to attendees. Transportation Master Plan staff were on hand to answer questions following the presentation. Transportation-related questions had themes regarding alternatives to automobile travel, congestion, and the timing of future transportation infrastructure improvements.

4.6 Preferred Land Use Plan

The preferred land use plan was developed based on feedback received from the public and stakeholders and upon review of alternative options and key features. Additional modifications were made in response to changes in population and employment projections and feedback from the PICs and other stakeholder engagement. The process to determine the features to be included in the preferred land use plan was to identify the features that best align with the Town's vision while providing high connectivity and accessibility using all modes of travel.

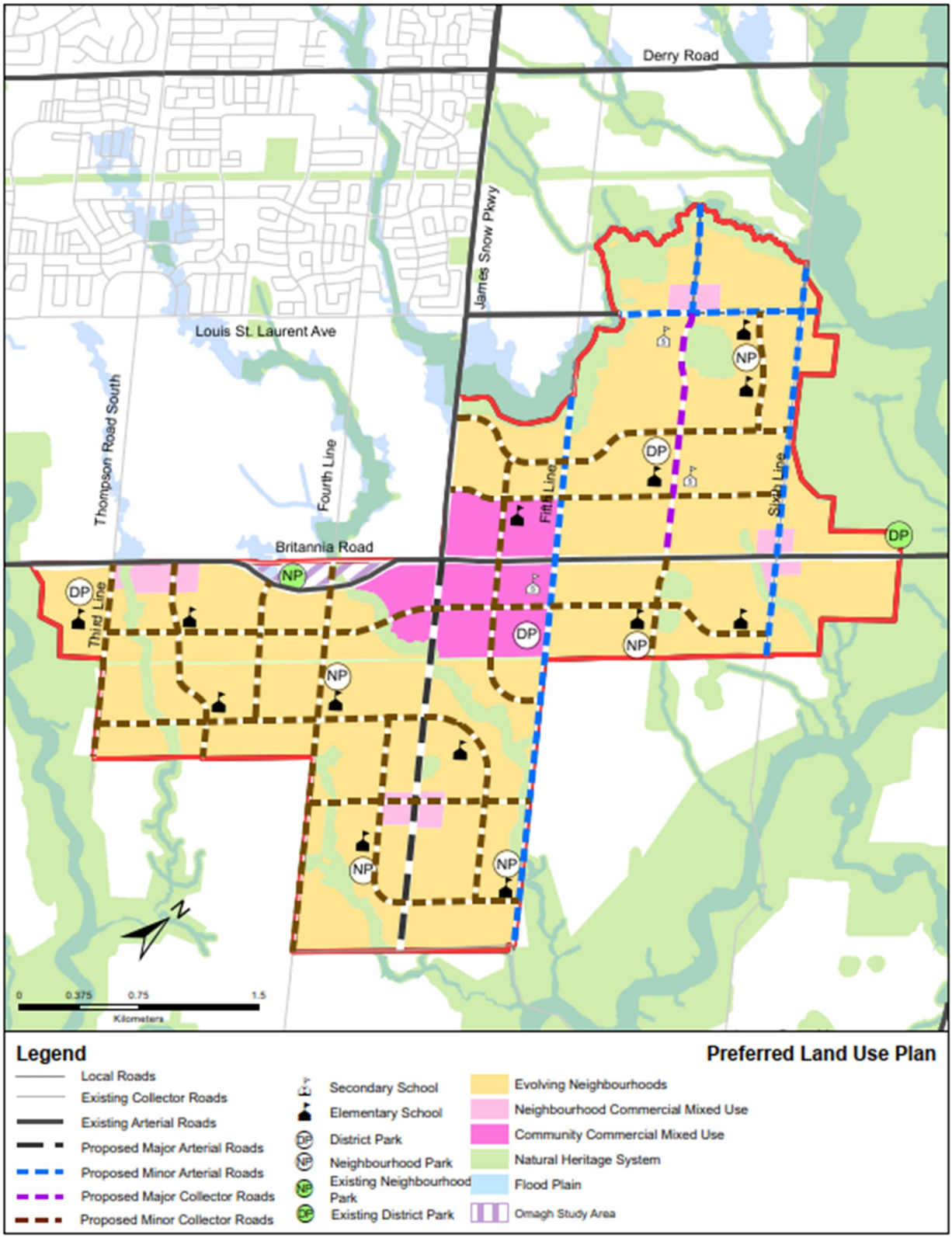
The preferred land use plan is most similar to Alternative Option 2 presented in **Section 4.3**. Key features include:

- Evolving neighbourhoods are integrated, resulting in a mix of housing types throughout the neighbourhoods.
- Retail nodes are located within each neighbourhood as the primary focus of intensity and activity.
- A logical, well-connected road and active transportation system is provided that balances connectivity with impacts to the NHS.
- A full range of public spaces, including parks, are planned, minimizing walking distance for most residents and providing for opportunities for co-location of schools and parks

The preferred land use plan has five designated neighbourhoods (**Figure 4.1**) with their own retail, schools, parks, and road network. The location of each retail / activity node within each neighbourhood is as follows:

- East: Local retail at Britannia Road and Sixth Line.
- Central: Major and local retail at Britannia Road and James Snow Parkway.
- South: Local retail at James Snow Parkway and a new collector road.
- West: Local retail at Britannia Road and a new collector road.
- North: Local retail at New North Regional Road and the Louis St. Laurent extension.

Figure 4.1: Preferred Land Use Plan



5 Preferred Transportation Network

The transportation network of the preferred land use plan was analyzed in greater detail to develop a level of comfort that it would support the land uses of the preferred option. A performance evaluation of the main arterial road intersections of the preferred network was conducted. The Town of Milton's Transportation Master Plan (TMP) model, which was originally developed from the Halton Region's Activity Based Model (ABM), was used to assess future traffic volumes. A subarea model that distributes and assigns the traffic volumes based on roadway and intersection capacities in the study area was developed to establish future traffic volumes. A traffic operational analysis of major intersections was undertaken using Synchro software to assess future intersection performance.

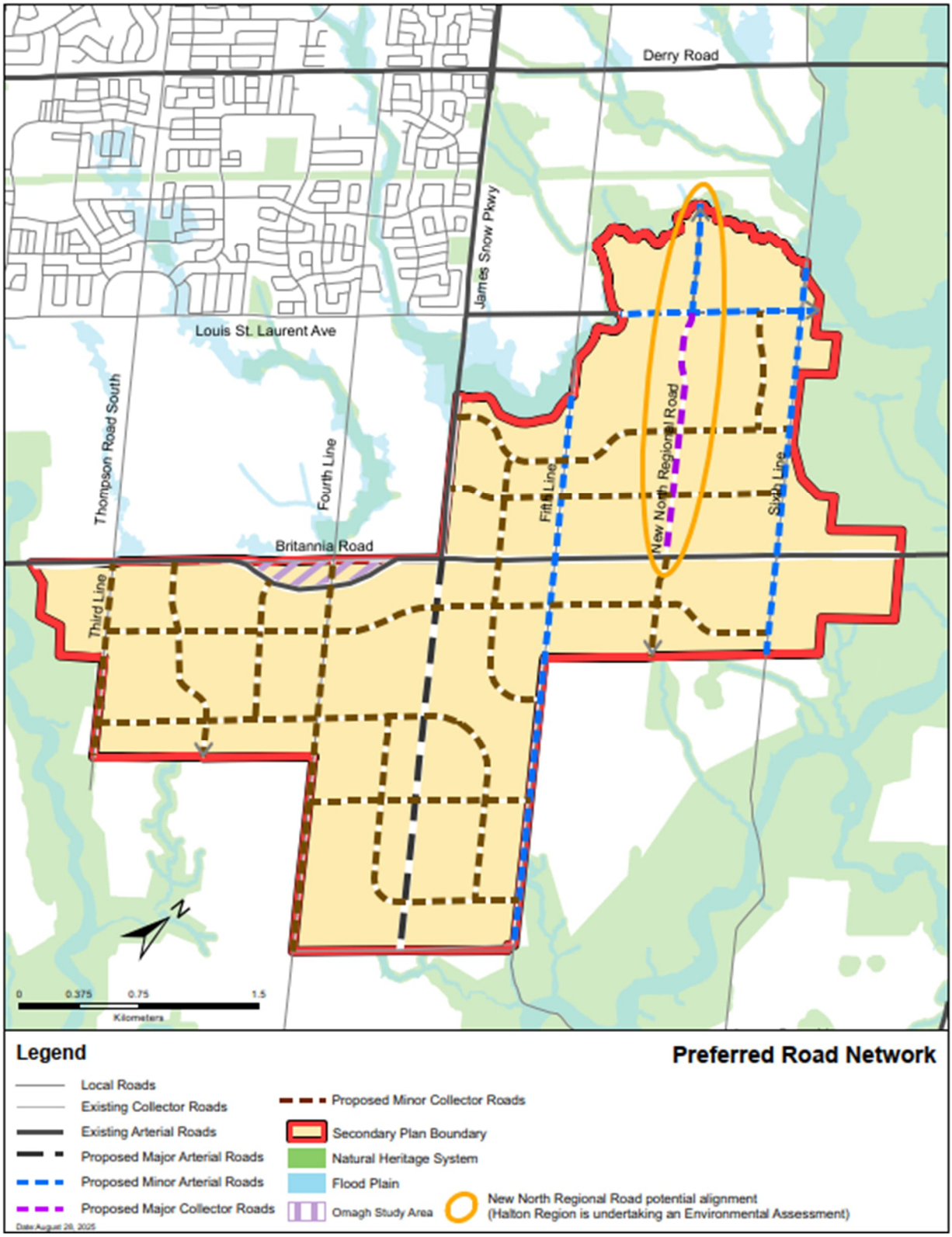
5.1 Road Network Design

The primary focus of the road network design involved identifying arterial and collector roads and their associated rights-of-way and establishing seamless connectivity with the overall regional road network. It is understood that the finer grid of the local road network will be planned in the subsequent planning exercises following this TMP.

The road network within the BSPA is designed to follow a modified grid pattern with Britannia Road and James Snow Parkway as the central spine roads. The modified grid network has strategic crossings of the National Heritage System, medium connectivity, an equal balance of collector roads and arterial roads, and a clear hierarchy of roads. The road network will incorporate best practices in low impact development design, such as bioswales or infiltration galleries, where technically feasible and appropriate, into the right-of-way construction to help control stormwater where it is generated.

The proposed road network indicating the road classification is provided in **Figure 5.1**.

Figure 5.1: Proposed Road Network



5.1.1 Existing Arterial Network

Britannia Road, James Snow Parkway, Trafalgar Road, Derry Road and Regional Road 25 are classified as major arterial roads. James Snow Parkway will be extended south to the Town of Oakville and will provide access to Highway 407 and connect to Neyagawa Boulevard in the future conditions. The existing four-lane roads are proposed to be widened to six lanes, with four general-purpose lanes and two HOV lanes.

Louis St. Laurent Avenue, Fifth Line, and Sixth Line are classified as minor arterial roads.

5.1.2 Existing Collectors

Within the study area, Third Line, Fourth Line, and Lower Base Line are all classified as two-lane collector roadways under existing conditions. To align with the 2025 Milton TMP, it was assumed that Lower Base Line would be widened to 4 lanes by 2051 (from Fifth Line to the Town east boundary).

5.1.3 New Arterial and Collector Roads

Louis St. Laurent Avenue is a minor arterial that was expanded to an urban four-lane cross-section in 2021 and extended to Fifth Line. Louis St. Laurent Avenue is planned to be extended from Fifth Line to Trafalgar Road.

The New North Regional Road is a new proposed north-south major arterial that is located between Fifth Line and Sixth Line and extends from Steeles Avenue to Britannia Road. The New North Regional Road is proposed to have a total of six lanes within a 47 m right-of-way. Halton Region has initiated an Environmental Assessment to study this potential road corridor. The Region's EA will determine whether the Region will proceed with a Regional road along this corridor. This TMP finds that a road is needed in this corridor to collect traffic from the various neighbourhoods of local roads and distribute to the wider arterial road network. Without this connection, significant vehicle volumes would need to be redirected to James Snow Parkway, Fifth Line, and Sixth Line. As such, the Britannia Secondary Plan makes provisions for a road along this corridor should the Region not proceed with a Regional road. The Secondary Plan identifies this road as a collector road between Britannia Road and the extension of Louis St. Laurent and as a minor arterial road north of the Louis St. Laurent extension to the northern limit of the Secondary Plan.

Fifth Line is a minor arterial road that has recently been widened to four lanes from Main Street to Derry Road. Further widening to four lanes is expected from Derry Road to Britannia Road.

Sixth Line is a minor arterial road. The Town is undertaking an Environmental Assessment to study widening this road to four lanes from Highway 401 to Britannia Road. The 2025 TMP recommends further widening of Sixth Line from Britannia Road to Lower Baseline Road.

A series of new collector roads have been proposed through development of the BSPA. The collector roads are assumed to be Town roads and generally will have one lane in each direction. In commercial areas, where high turning movement is expected, additional lanes are required to facilitate these movements. The collector roads will be developer built and all

additional studies for the collector road network ultimately will be conducted by the development community.

5.1.4 Intersections

Intersections between arterial roads and other arterial roads or collector roads were assumed to be either signalized or would only allow for right-in / right-out movements to/from the minor road. The exact intersection configurations with left- and right-turning lanes were determined through more detailed analysis presented in **Section 5.3**.

Intersections of two collector roads could be signalized, roundabouts or stop-controlled, depending on more detailed analysis once specific development plans are known.

The intersection of two local roads would be expected to be controlled by stop signs or roundabouts. To use a roundabout, adequate physical space will need to be identified and forecast vehicle traffic volumes would have to show that a roundabout would be an appropriate intersection control. If a local road were to intersect with an arterial road or collector road, it would be expected that the local road would be stop-controlled, and the arterial road or collector road would be free-flowing. It is possible that a local road intersection with an arterial or collector road could be signalized based on the traffic volumes and local conditions. More detailed study will be needed to confirm exact intersection configurations, control devices and operations in the future.

5.2 Road Classifications

The classification of roads in the Town of Milton is outlined in **Table 5.1**. The characteristics of each road classification are also provided.

Table 5.1: Road Classification Criteria

Road Classification	Function	# of Lanes	Right-of-Way (m)	Traffic Volume	Speed Limit (km/h)	Goods Movement
Major arterial*	Serves mainly inter-regional and regional travel demands. May serve an intensification corridor. Accommodates all truck traffic. Accommodates higher order transit services and high occupancy vehicle lanes. Connects urban areas in different municipalities. Carries high volumes of traffic.	6	Up to 50 m	High (5000+ vehicles/day)	Varies	Permitted

Road Classification	Function	# of Lanes	Right-of-Way (m)	Traffic Volume	Speed Limit (km/h)	Goods Movement
	Distributes traffic to and from provincial freeways and highways. Accommodates active transportation. Under Halton Region Authority					
Multi-purpose arterials	Serves a mix of functions of major arterials and minor arterials. Typically connects major arterials through urban areas or nodes.	6	Up to 50 m	Moderate – high (3000+ vehicles/day)	60-80	Not Recommended (local truck traffic only)
Minor arterials	Serves local traffic and connects urban areas through other arterial roads and extends from one end of the Town to the other end of the Town. Under Town Jurisdiction	4	35 m	Moderate to high (3000+ vehicles/day)	50-60	Not Recommended (local truck traffic only)
Transit-oriented development collector	Permits high operating speed of transit vehicles and connect nodes.	Varies	Exclusive right-of-way for transit vehicles	Accommodate only transit and emergency vehicles	60-80	No truck traffic
Major collector road	Serves local travel demands. Connects with two or more arterial roadways and often extends from one end of Town to another	Up to 4	26 m	Moderate – high (3000+ vehicles/day)	50-60	Restricted
Minor collector road	Serves local traffic and connects smaller local roads through collector roads.	2	22 m	Low (1000 – 3000 vehicles/day)	40-60	Restricted

* Right of Way requirements for major arterials are defined by the Regional Official Plan

5.3 Future Traffic Conditions at Intersections

A detailed traffic operational analysis of the performance of major intersections in the BSPA was completed to provide greater definition to the major intersection operations for the horizon year 2051. The analysis included a review of:

- Future background traffic conditions without the BSPA developed and with the proposed Trafalgar GO station located in the Agerton Secondary Plan Area.
- Future total traffic conditions with the BSPA developed and the proposed Trafalgar GO station located in the Agerton Secondary Plan Area.

The data used in the analyses in this report were the best available data at the time of this report. It is expected that new data could be collected to support development-specific applications, in line with the Region's Transportation Impact Study Guidelines.

5.3.1 Model Updates for Future Conditions

The existing traffic Synchro models were updated with the planned roadway network improvements to reflect the future conditions. The assumptions related to default saturation flow rates of 1,900 vehicles per hour per lane and lane width of 3.7 metres were retained for the future conditions.

The following measures were implemented in Synchro at the study intersections for the future traffic models:

- The HOV lanes added in the future Synchro model were coded with a lane utilization factor of 0.80, as per the Region's Guidelines.
- Since traffic volumes under future conditions would most likely result in a decrease in the variance of traffic within the peak hours, PHF of 1.00 was considered for all study intersections.
- The heavy vehicle (HV) percentages for future conditions were estimated by adjusting the existing HV percentages for certain movements to more accurately reflect future conditions. Under existing conditions, the majority of turning movement heavy vehicle percentages ranged from 0% to 10%. Most of the turning movements with HV percentages above 10% had very low turning movement volumes; therefore, these movements were adjusted down to 10% so that HV would not be overly-represented in the future conditions as the traffic volumes increase. New movements were assigned to have 2% HV and existing HV less than 2% were increased to 2%, which is consistent with the existing conditions analysis approach. It is assumed that HVs would be allowed to make all turning movements at the study area intersections. It is also assumed that as the BSPA is developed, the percentage of heavy vehicles on the roadway network will decrease. The BSPA primarily has residential land uses. The land uses will generate and attract passenger vehicle trips and the percentage of heavy vehicles seen today is expected to decrease.
- The speed limit along Britannia Road was set to 60 km/hr due to increased access along the corridor in future.

- Lost time adjustment of -1.0 seconds for protected/permitted left-turn movements and -2.0 seconds for through or right-turn movements were coded at signalized intersections.
- The vehicle clearance times (yellow and all-red) were computed based on speed using OTM Book 12 – Traffic Signal Guidelines and were coded in the model at signalized intersections.
- The pedestrian walk interval and flashing don't walk interval time requirements were computed based on the width of the crossing and walk speed using OTM Book 12 – Traffic Signals Guidelines and were coded in the model at signalized intersections.
- All signal timing plans were optimized for both splits and cycle lengths under future conditions to identify future roadway infrastructure improvement requirements.

The applied modelling inputs and adjustments under existing conditions and future conditions are acceptable for model calibration at the Secondary Plan level, but future transportation studies (Tertiary Plan, site-specific TISs) will need to confirm modeling inputs with Halton Region staff.

5.3.2 Future Background Conditions

For the analysis of future background traffic conditions, this study considers the 2051 horizon year. Future background traffic volumes typically include traffic added to the road network from corridor traffic growth and other planned developments in the surrounding area (not including the BSPA). The transportation network used to analyze background conditions includes any planned infrastructure improvements within and surrounding the BSPA and is consistent with the network used in the ongoing Milton TMP. The scenario reviewed under future background conditions included the future Trafalgar GO station located in the Agerton Trafalgar Secondary Plan Area.

The following sections discuss the planned infrastructure improvements, methodology to determine future background traffic volumes, and the results of the intersection capacity and queueing analysis conducted for future conditions prior to the addition of the BSPA traffic.

Planned Infrastructure Improvements

The Region, Metrolinx and the Town have several planned projects for the roadways and lands within the BSPA. Several planning documents were reviewed to determine planned improvements, including:

- Metrolinx 2041 Regional Transportation Plan.
- Halton Region 2011 Transportation Master Plan.
- Halton Region 2017 Mobility Management Strategy.
- Halton Region 2015 Active Transportation Master Plan.
- Halton Region Budget and Business Plan (2025).
- Milton 2018 Transportation Master Plan and the ongoing update.
- Britannia Road Widening Environmental Assessment, dated April 2014 and January 2017 Addendum.
- Trafalgar Road Corridor Study, dated June 2016.
- Transportation Master Plan for the Trafalgar Agerton Secondary Plan, dated December 2020.

The following improvements are expected to be operational by the 2051 horizon year and have been incorporated into the traffic models.

Road Network

- **Britannia Road:** Britannia Road was widened to a total of six lanes, with four general purpose and two HOV/Transit lanes throughout the Study Area.
- **James Snow Parkway:** James Snow Parkway was widened to a total of six lanes, with four general purpose and two HOV/Transit lanes throughout the BSPA and a southerly extension from Britannia Road to Highway 407 and Neyagawa Boulevard.
- **Louis St. Laurent Avenue:** Louis St. Laurent Avenue was extended from Fifth Line to Trafalgar Road and was assumed to have a total of four general purpose lanes.
- **New North Regional Road:** The New North Regional Road is a proposed new 6-lane (3 lanes per direction) major arterial road between Fifth Line and Sixth Line, with an interchange on Highway 401. Halton Region has initiated an Environmental Assessment to study this road corridor. For the purposes of the traffic analysis, it is assumed that the Region will construct this road.
- **Highway 401:** Highway 401 was widened from six lanes to 12-lanes within the study area.
- **Trafalgar Road:** Trafalgar Road was widened to a total of six lanes, with four general purpose and two HOV/Transit lanes
- **Derry Road:** Derry Road was widened to a total of six lanes, with four general purpose and two HOV/Transit lanes.
- **Lower Base Line**: Lower Base Line was widened to a total of 4 lanes from Fifth Line to Milton's eastern boundary.

Transit

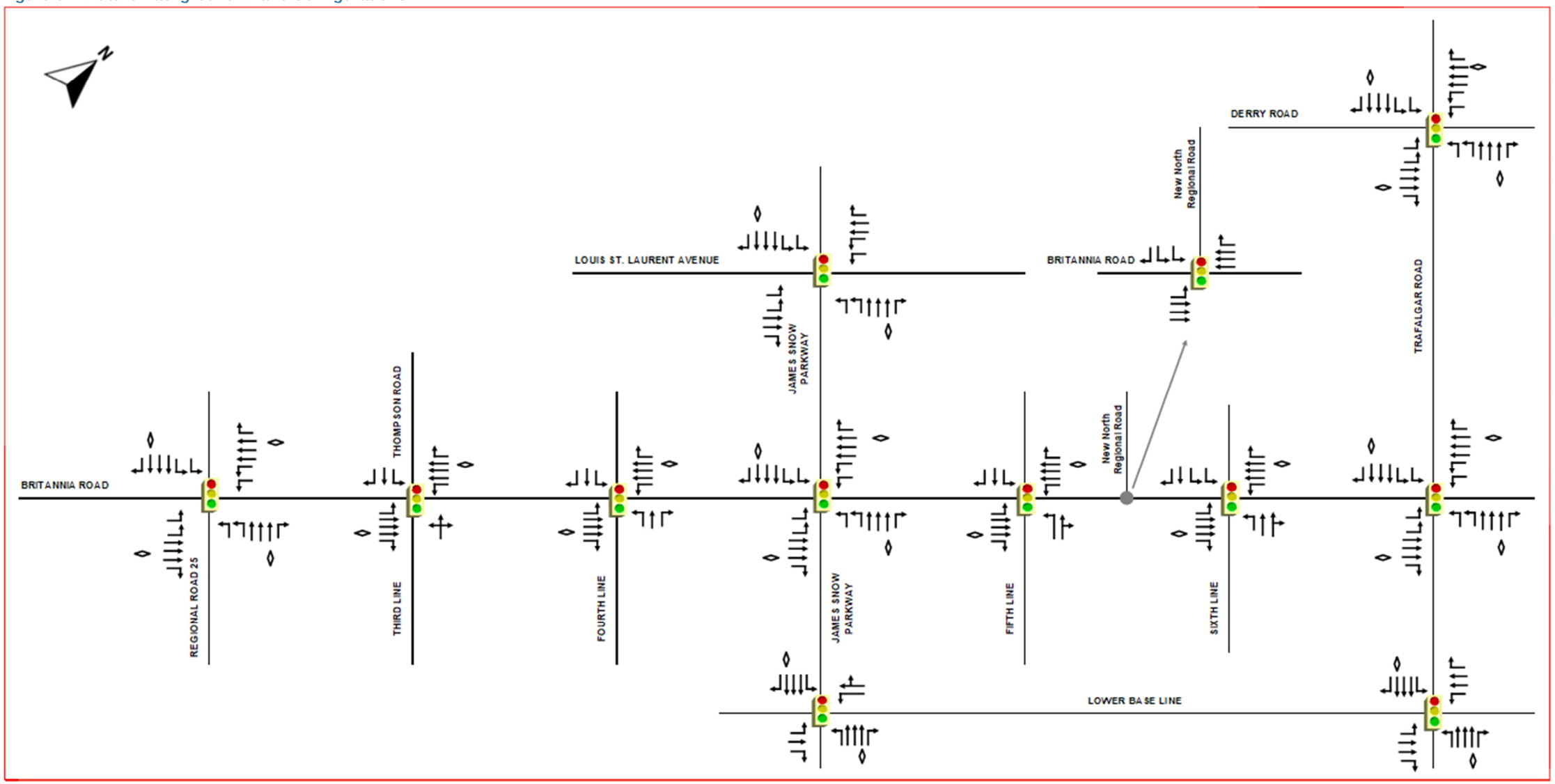
- The Metrolinx 2041 RTP identifies the following Priority Bus Transit Projects:
  - Trafalgar North Priority Bus (Highway 407 – Milton GO).
  - Britannia/Matheson Priority Bus (Highway 407 – Renforth Dr.).
  - Derry Priority Bus (Bronte Rd. – Humber College).

Active Transportation

- Multi-use paths in the boulevard on Britannia Road, Trafalgar Road and Derry Road were assumed.
- To align with the ongoing Milton TMP, cycle tracks were assumed along James Snow Parkway south of Louis St. Laurent Avenue. Cycle tracks were assumed along Fifth Line south of Britannia Road, with a multi-use trail north of Britannia Road. Separated bike lanes were assumed along Sixth Line and Lower Base Line. Cycle tracks were also assumed on the Louis St. Laurent Avenue extension from Fifth Line.

Due to the intensity of developments and roadway improvements taking place in and near the BSPA by 2051, projected traffic volumes are expected to be significantly larger than existing volumes. The future background intersection analysis was therefore conducted with intersection lane configurations appropriate to the roadway improvements assumed in the 2051 model network. The lane configurations used for the future background traffic analysis are illustrated in **Figure 5.2**.

Figure 5.2: Future Background - Lane Configurations



Future Background Traffic Volumes

Given the number of developments surrounding the BSPA, their potential interactions, and planned roadway improvement projects, the Region's ABM travel demand model was used to generate the future background volumes for the study area roadways. The Region's travel demand model was built in Emme, which is a multimodal transport planning software. The Emme model includes both the a.m. and p.m. hour travel demand forecasts for the 2051 horizon year. The Region's Emme model incorporates the latest Best Planning Estimates and land use approved by Regional Council.

The Region's model was developed to carry out Master Plan level analysis and is calibrated and validated at a screenline level; it has not been developed to undertake link level analysis which is typically required to support intersection level analyses of secondary plan studies. Therefore, a subarea traffic assignment and distribution model for the study area was developed that incorporated the traffic volumes and regional distribution from the Region's ABM. This has been accomplished by extracting the origin and destination matrices for all vehicular modes from the Region's ABM for the identified subarea boundary. The subarea model allowed for greater granularity on the trips that assigned the traffic volumes on the roadway network based on the roadway and intersection capacities in the BSPA.

To obtain the 2051 future background traffic volumes, the trips originating/destined to the BSPA were removed from the Region's 2051 ABM demand matrices. These matrices were then used to run on the Region's 2051 ABM network. The reassigned volumes represented the projected 2051 future background traffic. Subarea origin and destination matrices were then extracted from the Region's 2051 future background model and used in the subarea traffic assignment and distribution model, which is used to forecast the future background intersection volumes at the study intersections.

Figure 5.3 and **Figure 5.4** show the trip assignment for the a.m. and p.m. peak hours in the sub area model. The future background a.m. and p.m. peak hour turning movement volumes at the study intersections are illustrated in **Figure 5.5.**

Figure 5.3: Future Background AM Peak Hour Subarea Model Assignment

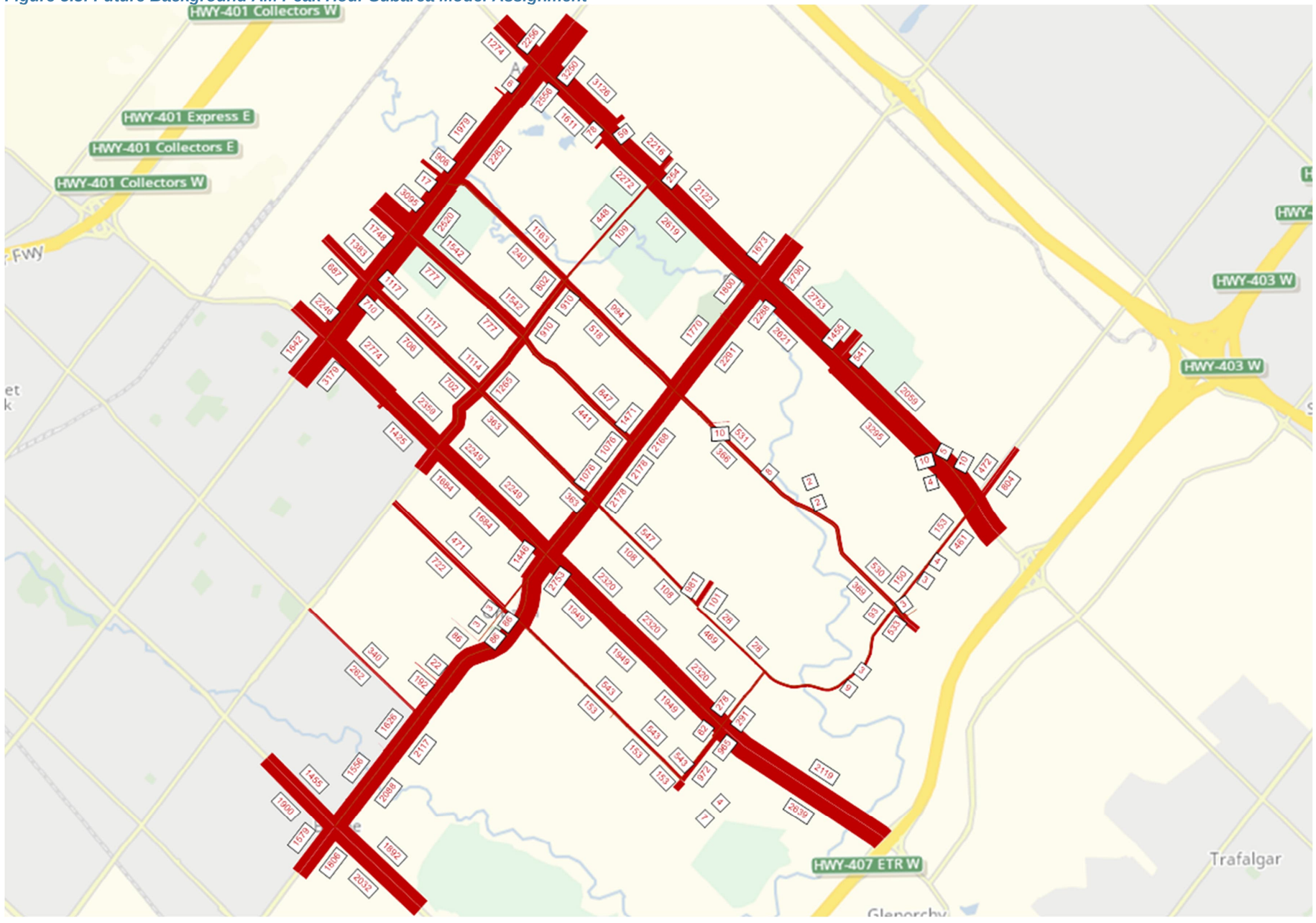


Figure 5.4: Future Background PM Peak Hour Subarea Model Assignment

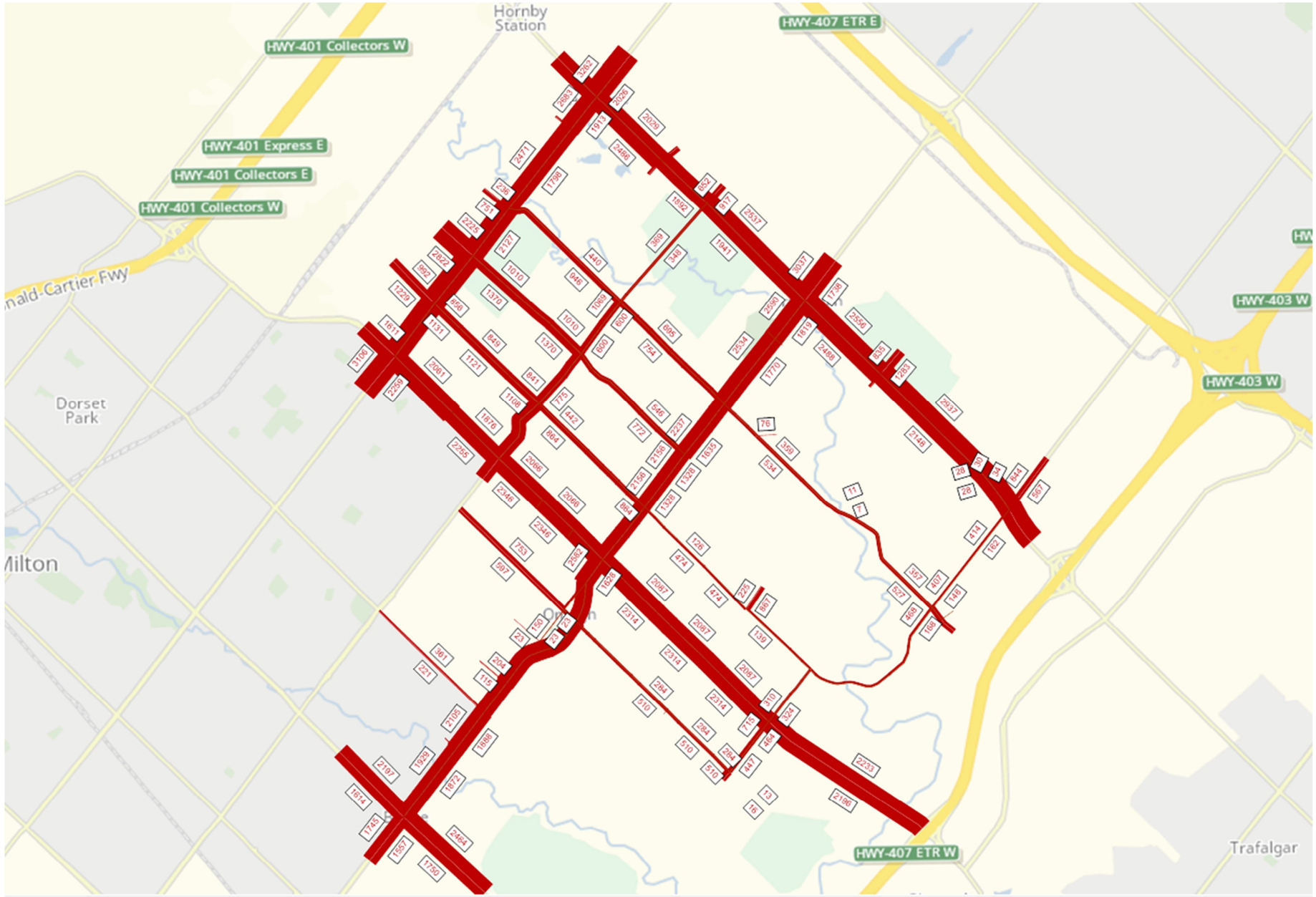
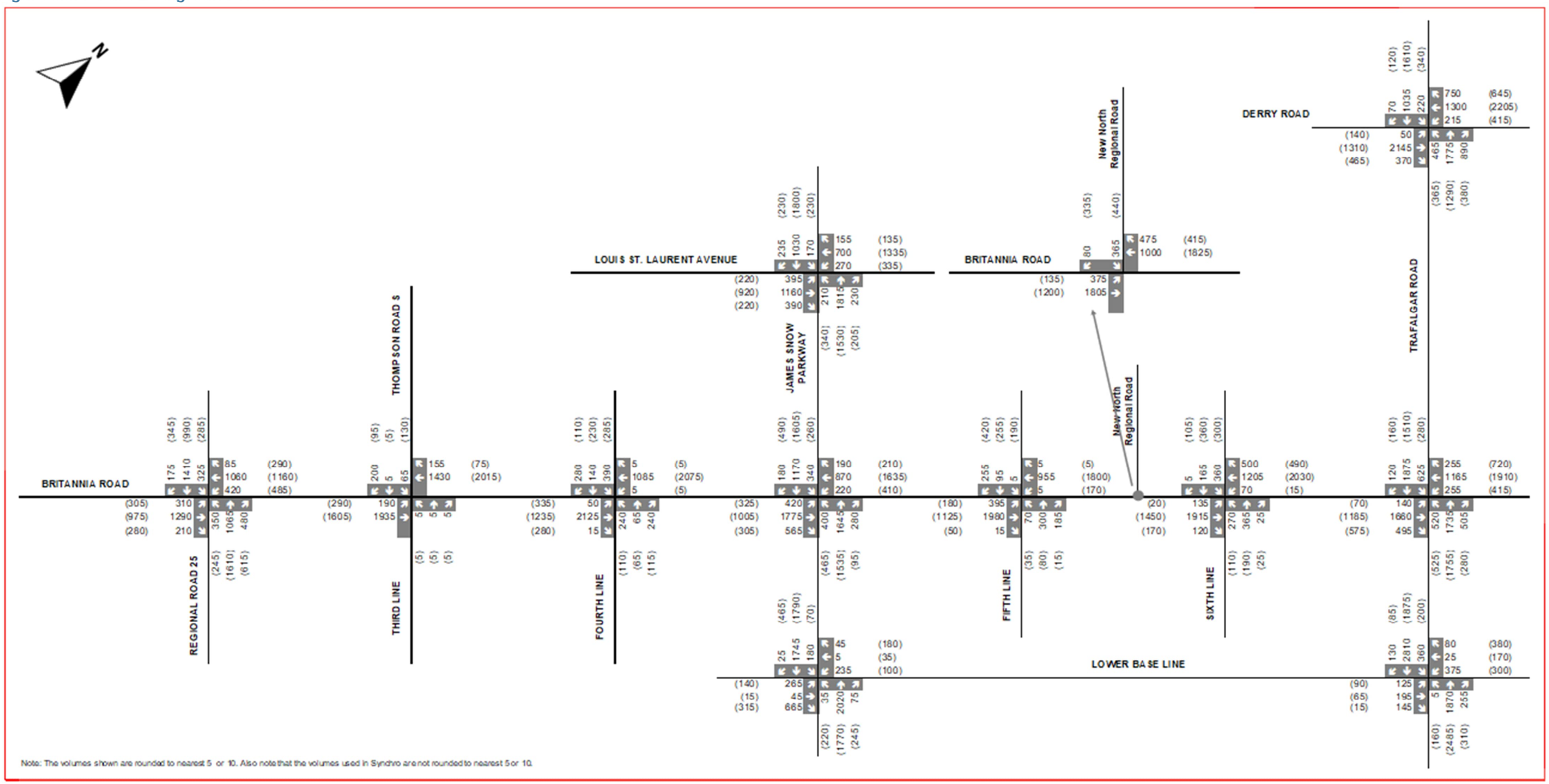


Figure 5.5: Future Background Traffic Volumes



wsp

Legend

xx AM Peak Hour Traffic Volumes

(xx) P.M. Peak Hour Traffic Volumes

Future Background Traffic Volumes

Britannia Seconday Plan

Town of Milton

Intersection Capacity Analysis

The results of the intersection capacity analysis for the future background conditions are presented in **Table 5.2**. Similar to the existing conditions analysis, a summary of the overall intersection and critical movements are noted with a focus on performance measures such as LOS, v/c ratios, and delay. The Region's criteria for identifying where impact mitigation is required include intersections or movements that operate with v/c ratios of over 0.85 for the overall intersection, through movements and shared through/turning movements, and over 0.95 for exclusive turning movements for signalized intersections. Detailed Synchro output sheets are provided in **Appendix E**.

Table 5.2: Intersection Capacity Analysis – Future Background Conditions

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	Overall V/C Max V/C Through Overall LOS (Delay in Seconds)	Critical Movement (V/C) (LOS)	Overall V/C Max V/C Through Overall LOS (Delay in Seconds)	Critical Movement (V/C) (LOS)
1. Britannia Road and Regional Road 25	Overall 0.94 EBT (0.96) E (55)	EBT (0.96) (E) WBL (0.99) (F) SBT (0.93) (D)	Overall 0.94 NBT (0.95) D (53)	WBL (1.04) (F) NBT (0.95) (D) SBL (1.0) (F)
2. Britannia Road and Thompson Road	Overall 0.56 EBT, WBT (0.61) A (10)	-	Overall 0.83 WBT (0.82) B (16)	WBT (0.82) (B)
4. Britannia Road and Fourth Line	Overall 0.86 EBT (0.77) C (29)	SBL (1.05) (F)	Overall 0.96 WBT (0.93) D (38)	EBL (0.97) (F) WBT (0.93) (D) SBL (0.92) (F)
5. Britannia Road and James Snow Parkway	Overall 1.04 NBT (1.05) E (66)	EBT (1.03) (E) WBL (0.98) (F) NBT (1.05) (F) SBL (1.04) (F)	Overall 1.07 SBT (1.09) E (74)	EBL (1.03) (F) WBT (1.06) (F) NBL (1.05) (F) NBT (0.91) (D) SBT (1.09) (F)
7. Britannia Road and Fifth Line	Overall 0.94 NBT (0.82) C (28)	EBL (0.99) (E)	Overall 0.78 WBT (0.85) C (24)	WBT (0.85) (C)
8. Britannia Road and New North Regional Road	Overall 0.76 EBT (0.61) B (16)	-	Overall 0.68 WBT (0.89) B (16)	WBT (0.89) (C)
9. Britannia Road and Sixth Line	Overall 0.82 EBT (0.91) D (35)	EBT (0.91) (D)	Overall 0.84 WBT (0.9) C (32)	WBT (0.9) (C) SBL (0.89) (E)
10. Britannia Road and Trafalgar Road	Overall 1.18 EBT (1.21) F (109)	EBT (1.21) (F) WBL (1.1) (F) NBL (1.09) (F) NBT (1.19) (F) SBL (1.05) (F) SBT (1.17) (F)	Overall 1.08 WBT (1.07) E (77)	EBT (0.86) (D) WBL (0.96) (F) WBT (1.07) (F) NBL (1.05) (F) NBT (1.04) (E) SBL (0.98) (F) SBT (1.06) (F)
11. James Snow Parkway and Louis St. Laurent Avenue	Overall 0.95 NBT (1.08) E (60)	NBT (1.08) (F)	Overall 1.08 SBT (1.15) F (90)	WBT (1.04) (E) NBL (1.64) (F) NBT (0.98) (E) SBL (1.12) (F) SBT (1.15) (F)
	Overall 1.08 NBT (0.98)		Overall 0.84 SBT (0.79)	-

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	Overall V/C Max V/C Through Overall LOS (Delay in Seconds)	Critical Movement (V/C) (LOS)	Overall V/C Max V/C Through Overall LOS (Delay in Seconds)	Critical Movement (V/C) (LOS)
18. James Snow Parkway and Lower Base Line Road	D (47)	EBR (1.11) (F) NBT (0.98) (F) SBL (1.02) (F)	B (20)	
19. Trafalgar Road and Derry Road	Overall 1.25 EBT (1.23) F (106)	EBT (1.23) (F) WBR (0.88) (D) NBL (1.27) (F) NBT (1.2) (F) NBR (1.2) (F) SBL (1.09) (F)	Overall 1.13 WBT (1.14) F (86)	WBT (1.14) (F) NBL (1.26) (F) NBT (0.94) (E) SBL (1.01) (F) SBT (1.12) (F)
20. Trafalgar Road and Lower Base Line	Overall 1.12 SBT (0.97) D (46)	WBL (1.27) (F) SBL (1.07) (F) SBT (0.97) (D)	Overall 0.99 NBT (0.93) C (34)	WBL (1.02) (F) WBR (1.04) (F) NBT (0.93) (C) SBL (0.91) (E)

Note: NB = northbound; SB = southbound; EB = eastbound; WB = westbound; L= left; T = through; R = right; *Overall intersection v/c from HCM 2000 methodology. Individual movement results from Synchro

Results in red text represent overall intersections or movements that meet the Region's criteria for considering mitigation strategies to reduce impacts to operations.

Under future background conditions in 2051, before the addition of the BSPA development roadway network and traffic, most of the analyzed intersections are expected to operate at or above capacity during the a.m. and p.m. peak hours. The following intersections are expected to operate with v/c ratios greater than 0.85 for the overall intersection, through movements and shared through/turning movements, and/or over 0.95 for exclusive turning movements for signalized intersections under future background conditions. Improvements such as dual left turn lanes were already assumed for the intersections noted below.

- **Britannia Road and Regional Road 25:**
  - The intersection is expected to operate with an overall v/c ratio exceeding 0.85 during both a.m. and p.m. peak hours.
  - The eastbound and southbound through movements operate with a v/c ratio greater than 0.85 in the a.m. peak hour. The westbound left-turn movement operates with a v/c ratio of 0.99 in the a.m. peak hour.
  - The northbound through movement operates with a v/c ratio greater than 0.85 in the p.m. peak hour. The westbound and southbound left-turn movements are expected to operate over capacity with v/c ratios greater than 1 in the p.m. peak hour.
- **Britannia Road and Fourth Line:**
  - The intersection is expected to operate with an overall v/c ratio exceeding 0.85 during both a.m. and p.m. peak hours.
  - The southbound left-turn movement operates with a v/c ratio greater than 1 in the a.m. peak hour.
  - The westbound through movement operates with v/c ratio greater than 0.85 in the p.m. peak hour. The eastbound left-turn movement operates with a v/c ratio of 0.99 in the p.m. peak hour
- **Britannia Road and James Snow Parkway:**
  - The intersection is expected to operate over capacity with overall v/c ratios exceeding 1 during both a.m. and p.m. peak hours.

  - The eastbound through, northbound through and southbound left-turn movements are expected to operate over capacity with v/c ratios greater than 1 in the a.m. peak hour. The westbound left-turn movement operates with a v/c ratio of 0.98 in the a.m. peak hour.
  - The eastbound left, westbound through, northbound left and southbound through movements are expected to operate over capacity with v/c ratios greater than 1 in the p.m. peak hour. The northbound through movement in the p.m. peak hour operates with a v/c ratio of 0.91.
- **Britannia Road and Fifth Line:**
  - The intersection is expected to operate with an overall v/c ratio exceeding 0.85 in the a.m. peak hour.
  - The eastbound left-turn movement operates with a v/c ratio of 0.99 in the a.m. peak hour.
  - The westbound through movement operates with a v/c ratio of 0.85 in the p.m. peak hour.
- **Britannia Road and Trafalgar Road:**
  - The intersection is expected to operate over capacity during both a.m. and p.m. peak hours with v/c ratio exceeding 1.0.
  - Several through and left-turn movements also operate over capacity during both the a.m. and p.m. peak hours.
- **James Snow Parkway and Louis St. Laurent Avenue:**
  - The intersection is expected to operate near capacity in the a.m. peak hour and over capacity in the p.m. peak hour.
  - The northbound through movement operates over capacity in the a.m. peak hour.
  - The westbound and southbound through movements along with northbound and southbound left turn movements operate over capacity in the p.m. peak hour. The northbound through movement operates with a v/c ratio of 0.98.
- **James Snow Parkway and Lower Base Line:**
  - The intersection is expected to operate over capacity in the a.m. peak hour.
  - The eastbound right and southbound left turn movements operate at over capacity in the a.m. peak hour. The northbound through movement operates with a v/c ratio of 0.98.
- **Trafalgar Road and Derry Road:**
  - The intersection is expected to operate over capacity in both a.m. and p.m. peak hours.
  - Several through and left-turn movements also operate over capacity during both the a.m. and p.m. peak hours.
- **Trafalgar Road and Lower Base Line:**
  - The intersection is expected to operate over capacity in the a.m. peak hour and near capacity in the p.m. peak hour.
  - Several turn movements also operate over capacity during both a.m. and p.m. peak hours.

Future Background Sensitivity Analysis

As most of the analyzed intersections are expected to operate at or above capacity, even with the assumed maximum capacities for through lanes and turning lanes, a sensitivity analysis was conducted. The sensitivity analysis assumed a reduction of 15% in total traffic volumes with the same lane configurations for the future background conditions. This reduction was deemed

reasonable to account for an increased number of work from home (and non-auto) trips that were not fully accounted for in the development of the Region's ABM.

The Region's ABM used to support this TMP was calibrated to a 2016 base year. The significant rise in work from home trips post pandemic was therefore not accounted for during model development. Future forecasts based on these calibration results may thus overestimate origin-demand flows.

As of May 2024, approximately 21.7% of Ontarians (and 24.7% of workers in the Toronto census metropolitan area in which Milton is located) mostly worked from home, with rates falling by approximately 1% a year since 2021[1]. Based on these trends, a long-rate estimate of 15% work from home trips was assumed, and OD volumes were reduced by the same amount (15%). Such a reduction can also account for any increases in the use of transit, cycling, and walking due to improvements in active transportation and transit infrastructure by 2051 that were not included in the ABM.

The results of the intersection capacity analysis for the future background sensitivity analysis conditions are presented in **Table 5.3**. Detailed Synchro output sheets are provided in **Appendix E**. As shown in the table, with the reduction in traffic volumes, all intersections along Britannia Road and James Snow Parkway are expected to operate below or near capacity with overall v/c ratios less than 1.0, except for the Trafalgar Road and Derry Road intersection, which operates with a v/c ratio of 1.06 in the a.m. peak hour. Some individual turning movements at the intersections of Britannia Road and Trafalgar Road, and Trafalgar Road and Derry Road, are still forecast to operate over capacity.

The results of this analysis show vastly improved conditions compared to the regular future background conditions analysis. This highlights the need to maintain / incent work from home policies, and promote the use of sustainable transportation modes, to reduce overall car volumes. As the analysis shows, an overall 15% further reduction in car volumes beyond what the model already calculates for modal split would be required to ensure most intersection movements fall below the thresholds identified by the Region. In addition, increased transit service in the study area would further improve the traffic operations at the intersections such as Britannia Road and Trafalgar Road, that already have lane configurations that utilize the full available geometry.

Table 5.3: Intersection Capacity Analysis – Future Background Sensitivity Conditions

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	Overall V/C Max V/C Through Overall LOS (Delay in Seconds)	Critical Movement (V/C) (LOS)	Overall V/C Max V/C Through Overall LOS (Delay in Seconds)	Critical Movement (V/C) (LOS)
1. Britannia Road and Regional Road 25	Overall 0.81 EBT (0.83) D (45)	-	Overall 0.81 NBT (0.83) D (43)	-
2. Britannia Road and Thompson Road	Overall 0.48 WBT (0.53) A (9)	-	Overall 0.71 WBT (0.69) B (12)	-

[1] Statistics Canada. (2024). More Canadians commuting in 2024. Retrieved from: https://www150.statcan.gc.ca/n1/daily-quotidien/240826/dq240826a-eng.htm

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	Overall V/C Max V/C Through Overall LOS (Delay in Seconds)	Critical Movement (V/C) (LOS)	Overall V/C Max V/C Through Overall LOS (Delay in Seconds)	Critical Movement (V/C) (LOS)
4. Britannia Road and Fourth Line	Overall 0.74 EBT (0.65) C (22)	SBL (0.88) (E)	Overall 0.80 NBT (0.79) C (29)	-
5. Britannia Road and James Snow Parkway	Overall 0.89 NBT (0.90) D (49)	SBL (0.88) (F)	Overall 0.91 SBT (0.92) D (52)	-
7. Britannia Road and Fifth Line	Overall 0.76 NBT (0.72) C (20)	-	Overall 0.65 WBT (0.70) B (19)	-
8. Britannia Road and New North Regional Road	Overall 0.60 EBT (0.52) B (14)		Overall 0.59 WBT (0.81) B (15)	-
9. Britannia Road and Sixth Line	Overall 0.70 EBT (0.76) C (29)	-	Overall 0.71 WBT (0.76) C (26)	-
10. Britannia Road and Trafalgar Road	Overall 0.99 EBT (1.00) E (63)	EBT (1.00) (E) WBL (0.94) (F) NBL (1.03) (F) NBT (0.97) (E) SBL (1.02) (F) SBT (0.98) (E)	Overall 0.94 WBT (0.94) D (52)	WBL (0.86) (E) WBT (0.94) (D) NBL (0.93) (F) NBT (0.88) (D) SBT (0.86) (D)
11. James Snow Parkway and Louis St. Laurent Avenue	Overall 0.83 NBT (0.86) D (44)	NBT (0.86) (D)	Overall 0.91 SBT (0.96) D (53)	WBT (0.97) (E) NBL (0.99) (F) SBT (0.96) (E)
18. James Snow Parkway and Lower Base Line Road	Overall 0.87 NBT (0.83) C (31)	EBR (0.94) E	Overall 0.69 SBT (0.66) B (16)	-
19. Trafalgar Road and Derry Road	Overall 1.06 EBT (1.04) E (63)	EBT (1.04) (E) NBL (1.08) (F) NBT (1.02) (E) NBR (1.01) (E) SBL (0.93) (F)	Overall 0.96 SBT (0.98) E (56)	WBT (0.97) (D) NBL (0.99) (F) SBT (0.98) (E)
20. Trafalgar Road and Lower Base Line	Overall 0.94 SBT (0.87) C (32)	WBL (0.90) (E) SBL (0.93) (E) SBT (0.87) (C)	Overall 0.84 NBT (0.81) C (24)	-

Queueing Analysis

The queueing results from the Synchro model were summarized for exclusive movements with storage lanes for the future background and future background sensitivity conditions, to help determine the storage lengths required for the turn lanes in the future. **Table 5.4** shows the summary of the 95th percentile queues for future background and sensitivity scenarios. Queues for all movements can be found in the Synchro output sheets, which are provided in **Appendix E.**

Table 5.4: Intersection Queueing Analysis – Future Background Conditions

Intersection	Turning Movement	Future Background 95th Percentile Queue (m)		Future Background Sensitivity 95th Percentile Queue (m)	
		A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour
1. Britannia Road and Regional Road 25	EBL	#62	#61	49	48
	EBR	23	46	17	29
	WBL	#91	#106	#72	#80
	WBR	10	51	7	33
	NBL	#77	47	56	41
	NBR	94	140	61	94
	SBL	#66	#69	51	#52
	SBR	16	39	14	19
2. Britannia Road and Thompson Road South / Third Line	EBL	25	#79	10	#59
	WBR	8	5	7	3
	SBL	17	34	15	29
	SBR	20	2	15	0
4. Britannia Road and Fourth Line	EBL	10	#146	8	#103
	EBR	0	10	0	9
	NBL	61	39	50	34
	NBR	39	9	29	4
	SBL	#119	#99	#88	82
	SBR	50	8	28	3
5. Britannia Road and James Snow Parkway	EBL	#86	#80	67	#63
	EBR	113	44	78	28
	WBL	#58	#80	#47	64
	WBR	17	28	11	19
	NBL	#79	#106	63	#83
	NBR	55	6	42	3
	SBL	#83	#62	#66	#49
	SBR	20	119	16	88
7. Britannia Road and Fifth Line	EBL	#123	#57	#74	#44
	EBR	0	4	0	3
	WBL	1	#31	1	23
	WBR	11	12	10	11
	NBL	20	10	18	9
	SBR	17	79	16	61
8. Britannia Road and New North Regional Road	EBL	#66	13	31	12
	WBR	17	14	16	14
9. Britannia Road and Sixth Line	EBL	30	6	22	5
	EBR	16	13	12	12
	WBL	15	5	13	5
	WBR	22	54	18	34
	NBL	#117	#62	#89	#47
	SBL	58	#70	49	#48
	SBR	-	13	-	9
10. Britannia Road and Trafalgar Road	EBL	#33	18	26	16
	EBR	97	#165	69	113
	WBL	#67	#93	#54	#76
	WBR	31	217	20	157
	NBL	#114	#120	#97	#98
	NBR	#148	48	104	37
	SBL	#130	#71	#112	49
	SBR	17	17	13	11

Intersection	Turning Movement	Future Background		Future Background Sensitivity	
		95th Percentile Queue (m)		95th Percentile Queue (m)	
		A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour
11. James Snow Parkway and Louis St. Laurent Avenue	EBL	71	43	62	36
	EBR	79	38	64	26
	WBL	#59	64	46	52
	WBR	17	15	10	11
	NBL	44	#105	38	#71
	NBR	37	32	26	21
	SBL	#46	#68	#41	#48
	SBR	19	42	17	29
18. James Snow Parkway and Lower Base Line Road	EBL	72	39	60	32
	EBR	#213	52	#158	41
	WBL	63	25	52	22
	NBL	7	#61	6	#39
	NBR	9	12	8	10
	SBL	#68	9	#51	6
	SBR	1	18	0	14
19. Trafalgar Road and Derry Road	EBL	13	#38	11	#30
	EBR	58	113	39	80
	WBL	42	#87	36	67
	WBR	211	170	154	116
	NBL	#114	#99	#92	#77
	NBR	#339	71	#262	45
	SBL	#59	#84	#49	#63
	SBR	0	12	0	8
20. Trafalgar Road and Lower Base Line	EBL	41	28	34	25
	EBR	22	0	6	0
	WBL	#153	#113	#109	#83
	WBR	1	#110	0	78
	NBL	1	38	1	28
	NBR	20	7	16	7
	SBL	#134	#69	#101	#45
	SBR	9	3	3	1

Note:
 # - Volume for the 95th percentile cycle exceeds capacity.
N/A – No storage lanes at the intersection. Results in red text represent movements exceeding storage length.

5.3.3 Britannia Development Trips

The BSPA is approximately 897 gross developable hectares of land and is proposed to be developed into a mix of residential and employment land uses. The BSPA is proposed to support approximately 57,500 people and 9,300 jobs through a mix of low to high density residential units, with the higher densities located around neighbourhood nodes. The neighbourhood nodes will also include retail land uses to help support the higher order transit proposed on Britannia Road and James Snow Parkway. The land use statistics and employment projections presented in **Table 1.1** and **Table 1.2** are used for estimating the vehicle trips generated by the proposed development, which is further described below.

Trip Generation

Trip generation for the BSPA development was estimated using the rates outlined in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition. The trip generation summary is provided in **Table 5.5**. Certain assumptions were made to ensure that the generated trips accurately reflect the proposed development and future vision for the BSPA:

- A non-auto modal split of 33 percent was assumed for the BSPA trips. This is based on extrapolating to 2051 the 2031 target of 28 percent specified in the Region's 2011 TMP (five percent active transportation, 20 percent transit and three percent transportation demand management), and being cognizant of the rise of work from home jobs (as of May 2024, approximately 22% of Ontarians work mostly from home).
- For trip generation purposes, the jobs related to the commercial land use in mixed use areas are categorized into retail employment, while the jobs included for schools and places of worship are categorized into institutional employment and the jobs included in evolving neighborhoods and residential areas of mixed-use areas are categorized as work from home or no fixed place of work.
- The trips related to retail employment were estimated using the shopping centre land use (ITE Land Use Code 820).
- The institutional jobs were assumed to be associated with the schools within the study area. The ITE trip generation rates for school land use types factor in both employee trips and student trips, however, the ITE trip generation rates for residential land uses also would factor in student trips (family leaves residence, parents drop off their child at school, and then continue to work). Therefore, the General Office Building trip generation rates were used for school employees. For trip generation purposes, the 70 jobs from places of worship are also included in the institutional jobs.
- The rest of the jobs identified in the residential land uses of mixed-use areas (work from home or no fixed place of work) were assumed to generate no extra trips as they are already part of trips generated from residential land uses.

As shown in the **Table 5.5,** the full build-out of the BSPA development is expected to generate a total of 7,810 two-way (2,756 inbound and 5,054 outbound) vehicle trips in the a.m. peak hour and 11,602 two-way (6,433 inbound and 5,169 outbound) vehicle trips in the p.m. peak hour.

Table 5.5: Trip Generation Summary - ITE Trip Generation Manual

BSPA Land Use	Land Use	Basis/Parameter	Vehicle Trips			
			Weekday A.M. Peak Hour		Weekday P.M. Peak Hour	
			Inbound	Outbound	Inbound	Outbound
Evolving Neighbourhoods	**Singles (3,415 Units)**	ITE Land Use 210 (Single-Family Detached Housing)	463	1,389	1,730	1,016
		Non-Auto Trip Reduction	153	458	571	335
		Total Singles Trips	310	930	1,159	681
	Semis, Secondary Suites, Townhouses and B2B Townhouses (10,725 Units)	ITE Land Use 215 (Single-Family Attached Housing)	1,393	4,178	3,794	2,637
		Non-Auto Trip Reduction	460	1,379	1,252	870
		Total Semis, Secondary Suites,	933	2,800	2,542	1,767

BSPA Land Use	Land Use	Basis/Parameter	Vehicle Trips			
			Weekday A.M. Peak Hour		Weekday P.M. Peak Hour	
			Inbound	Outbound	Inbound	Outbound
		Townhouses and B2B Townhouses				
	Total Evolving Neighbourhood Trips		**1,243**	**3,730**	**3,701**	**2,447**
Neighbourhood Commercial Mixed Use	**Shopping Center (1,840 Employees)**	ITE Land Use 820 (Shopping Center (employees))	765	431	1,656	1,656
		Non-Auto Trip Reduction	253	142	546	546
		Total Shopping Center	513	288	1,110	1,110
	Medium Density Residential (420 Units)	ITE Land Use 220 (Multi-Family Housing (Low-Rise))	37	116	127	74
		Non-Auto Trip Reduction	12	38	42	25
		Total Medium Density Residential	25	78	85	50
	High Density Residential / Mixed Use (680 Units)	ITE Land Use 221 (Multi-Family Housing (Mid-Rise))	66	221	162	104
		Non-Auto Trip Reduction	22	73	53	34
		Total High Density Residential / Mixed Use	44	148	109	69
	Total Neighbourhood Commercial Mixed Use Trips		**582**	**515**	**1,303**	**1,229**
Urban Village centre	**Shopping Center (1,510 Employees)**	ITE Land Use 820 (Shopping Center (employees))	628	353	1,359	1,359
		Non-Auto Trip Reduction	207	117	448	448
		Total Shopping Center	421	237	911	911
	Medium Density Residential (360 Units)	ITE Land Use 220 (Multi-Family Housing (Low-Rise))	32	102	110	65
		Non-Auto Trip Reduction	11	34	36	21
		Total Medium Density Residential	22	68	74	43
	High Density Residential / Mixed Use (730 Units)	ITE Land Use 221 (Multi-Family Housing (Mid-Rise))	71	238	174	111
		Non-Auto Trip Reduction	23	79	57	37
		Total High Density Residential / Mixed Use	48	160	116	74
	Townhouses and B2B Townhouses (1,150 Units)	ITE Land Use 215 (Single-Family Attached Housing)	148	444	405	281
		Non-Auto Trip Reduction	49	147	134	93

BSPA Land Use	Land Use	Basis/Parameter	Vehicle Trips			
			Weekday A.M. Peak Hour		Weekday P.M. Peak Hour	
			Inbound	Outbound	Inbound	Outbound
		Total Townhouses and B2B Townhouses	99	298	271	188
	Total Urban Village Centre Trips		**589**	**763**	**1,372**	**1,217**
Schools	**General Office (1,320 Employees)**	ITE Land Use 710 (General Office Building (employees))	510	69	84	412
		Non-Auto Trip Reduction	168	23	28	136
	Total School Trips		341	47	57	276
Overall Total			**2,756**	**5,054**	**6,433**	**5,169**

Trip Distribution

The trip distribution from the Region's ABM model was adopted for distributing trips within the BSPA study area using sub-area matrices. Both external and internal trips for the development are therefore allocated according to the trip distribution pattern established in the Region's ABM model following that model's methodology.

Trip Assignment

The subarea traffic assignment and distribution model was used to assign the trips onto the study area roadway network based on roadway and intersection capacities. The model allows for finer granularity in assigning the trips to the roadway network by incorporating the following features:

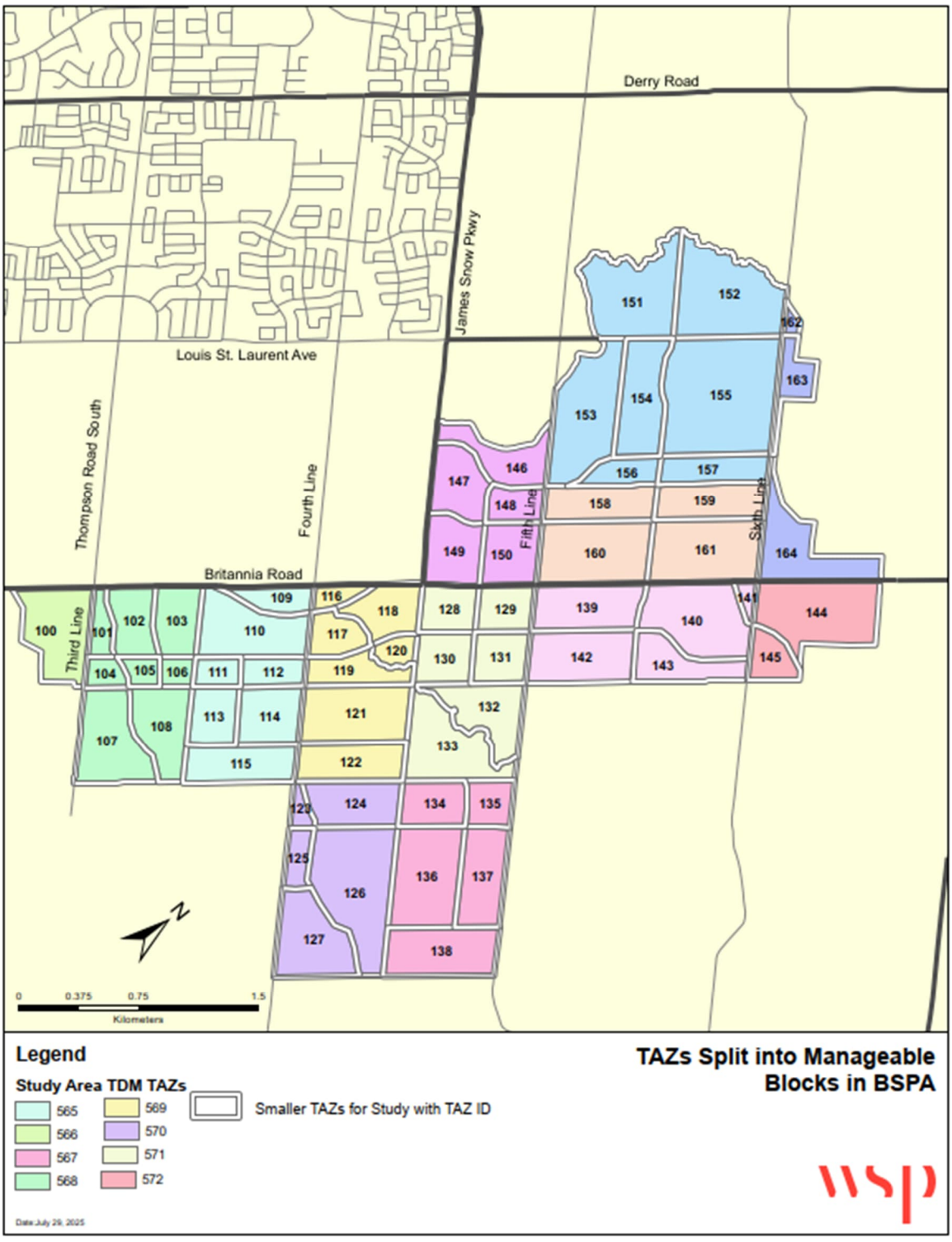
- The TAZs of the BSPA in the regional model were split into 65 smaller zones that allowed for disaggregating the trips into smaller manageable blocks that considered the internal roadway network and the proposed land use boundaries. This facilitates better trip assignment to collector and arterial roads throughout the study area.
- The trips were disaggregated based on the area of the corresponding land use in the smaller TAZs.
- Park and Natural Heritage Site lands were not expected to generate trips during the weekday peak hours; therefore, no trips were assigned to these land uses.
- The institutional trips were divided evenly for each of the 17 schools within the study area TAZs based on their identified location.
- All the roadways were coded in the model with appropriate speeds and capacity that are representative of their respective functional classifications.

Figure 5.6 illustrates the four BSPA TAZs split into 65 manageable development blocks.

For the future total conditions, the BSPA trips were assigned onto the existing roadway network and onto the proposed arterial and collector road network in the BSPA using a roadway assignment network model that distributes and assigns traffic based on travel times and shortest distance. This approach allows for trips destined to or originating in a BSPA TAZ to be assigned to the network based on network congestion levels. Background trips traveling through the BSPA were assumed to remain on the regional network for most of the time, except that in some cases, they may get rerouted if the intersections are congested. The trips were assigned

to the network in the model based on an origin-destination matrix, which was developed using the trip generation and distribution steps discussed above.

Figure 5.6: TAZs Split into Manageable Blocks in BSPA



5.3.4 Future Total Conditions

The future total conditions represent year 2051 conditions when the BSPA is fully developed with the future planned land uses along with the new arterial and collector road network. Typically, in a transportation impact study, the future total traffic is obtained by the sum of the future background traffic and development-generated traffic added to the intersections within the Study Area. In this case, the impacts are assessed for the whole BSPA development through the use of a subarea model. **Figure 5.7** and **Figure 5.8** show the trip assignment for the a.m. and p.m. peak hours, respectively, in the subarea model for the future total conditions. Since the analysis, there have been a few minor changes to the collector road network, such as an extension of the east-west collector road to connect to Thompson Road to the west, a collector road connection to Britannia Road west of Fourth Line near the Omagh area, and a north-south collector west of the New North Regional Road shifted to east of the New North Regional Road. These changes were not incorporated in the assignment network as it is anticipated that these changes would have little impact on the projected volumes at the study intersections and would not change any findings or conclusions. **Figure 5.9** shows the BSPA development trips assigned to the study area intersections. It is to be noted that unlike typical transportation impact studies, in this study, the sum of future background volumes and the development trips does not always yield the total future volumes, as some of the background trips get rerouted through the new intersections and the added roadway network so as to minimize the travel time costs.

The future total Synchro model used to analyze intersection performance includes future background study intersections plus new arterial and collector road intersections illustrated in the BSPA preferred land use plan (**Figure 4.1**). The intersections analyzed for the future total conditions are illustrated in **Figure 5.10**.

The lane configurations used in this analysis are illustrated in **Figure 5.11**. New signals were considered if they were a minimum distance of 300 metres from an adjacent signalized intersection, in accordance with the Halton Region Access Management Guideline.

As described in the traffic assignment section above, the future total traffic was assigned to the future roadway network to obtain future turning movement volumes at each study intersection. The future total traffic volumes at the study intersections are illustrated in **Figure 5.12**.

The following subsections discuss the intersection capacity and queueing analyses conducted, along with any mitigation measures required to accommodate the BSPA development traffic. This includes an intersection capacity analysis at both the existing intersections as well as the additional intersections along Britannia Road and James Snow Parkway that are formed as a result of the proposed road network in the BSPA.

Figure 5.7: Total Traffic Assignment – AM Peak Hour

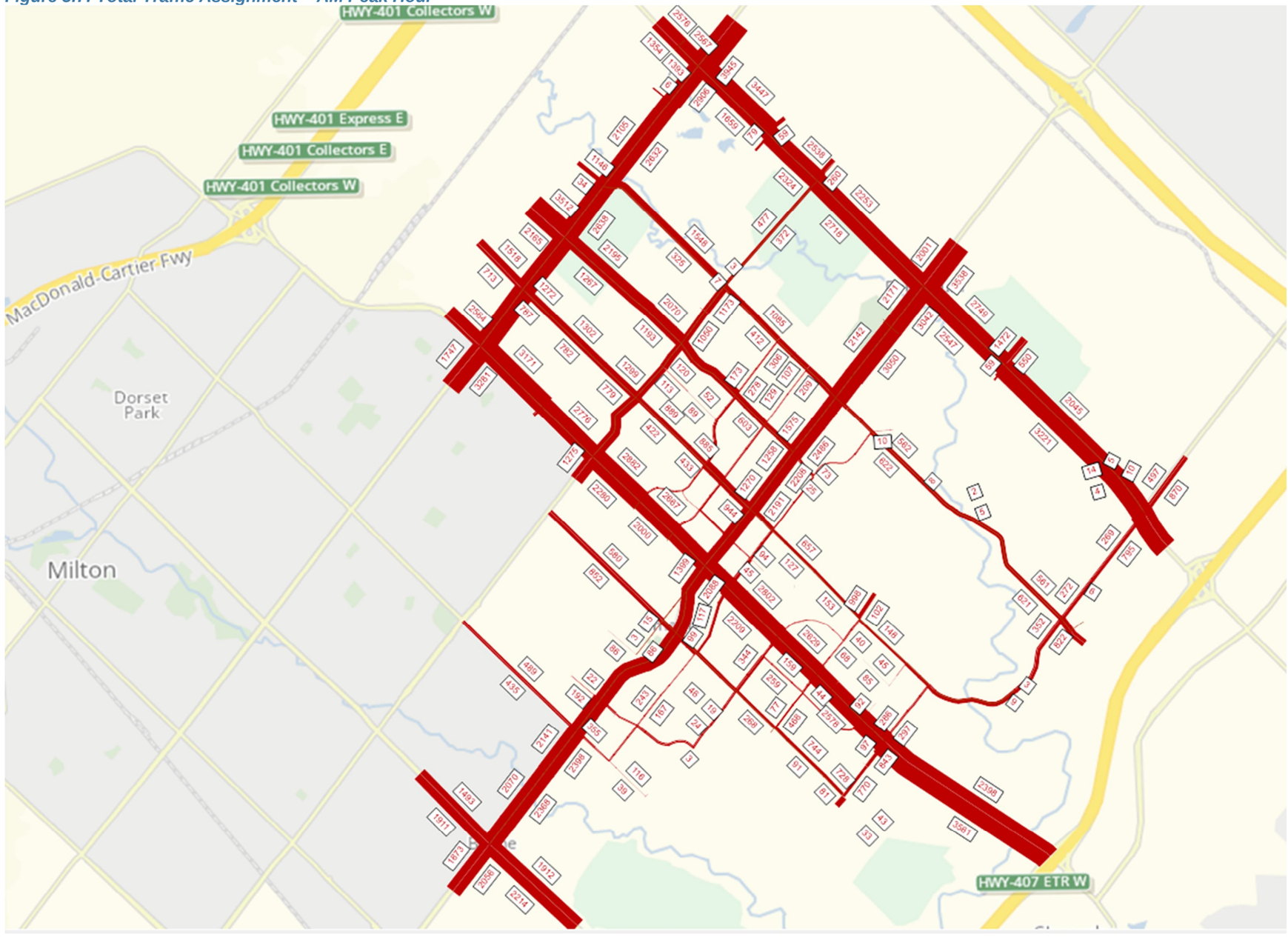


Figure 5.8: Total Traffic Assignment – PM Peak Hour

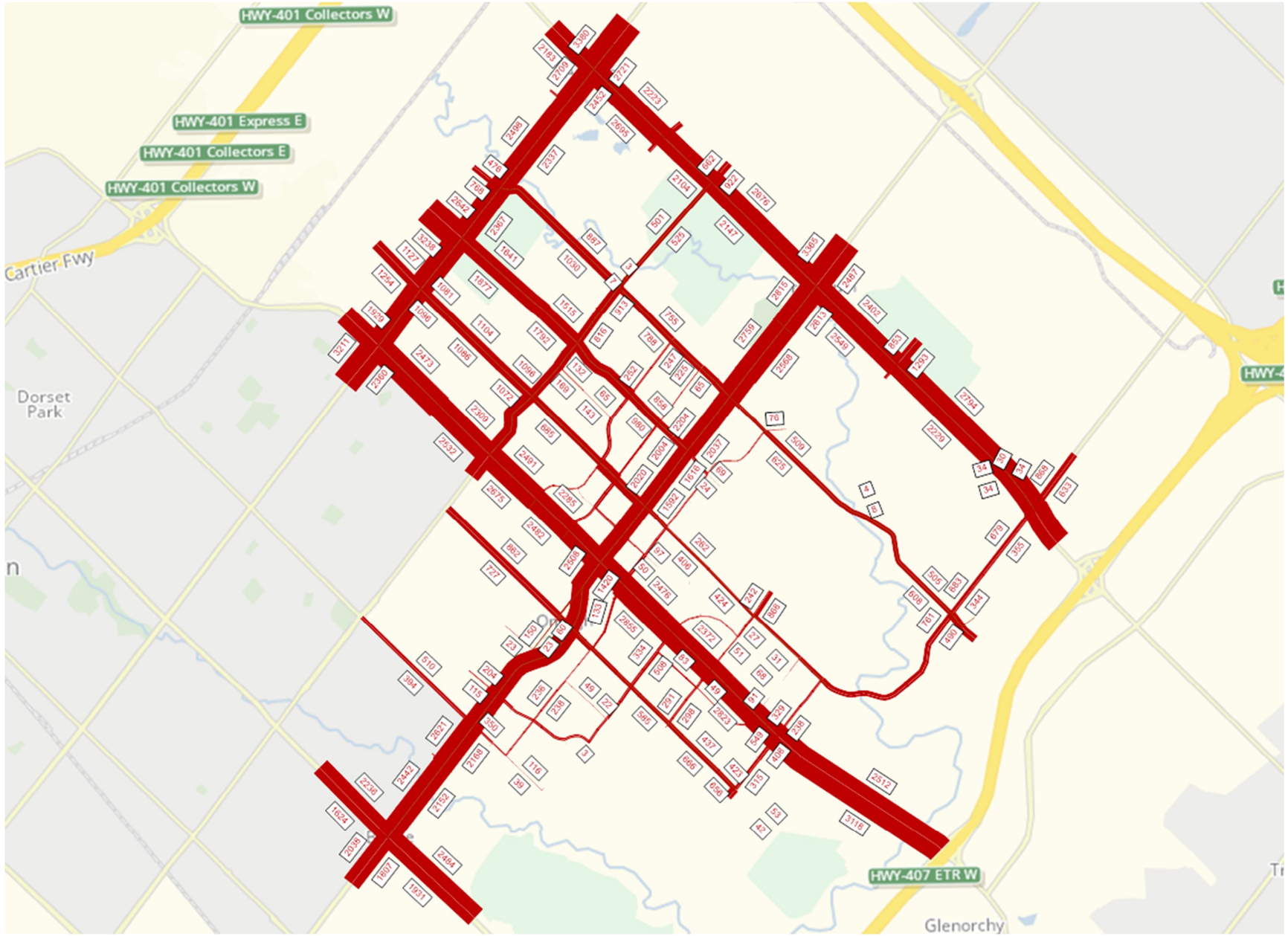
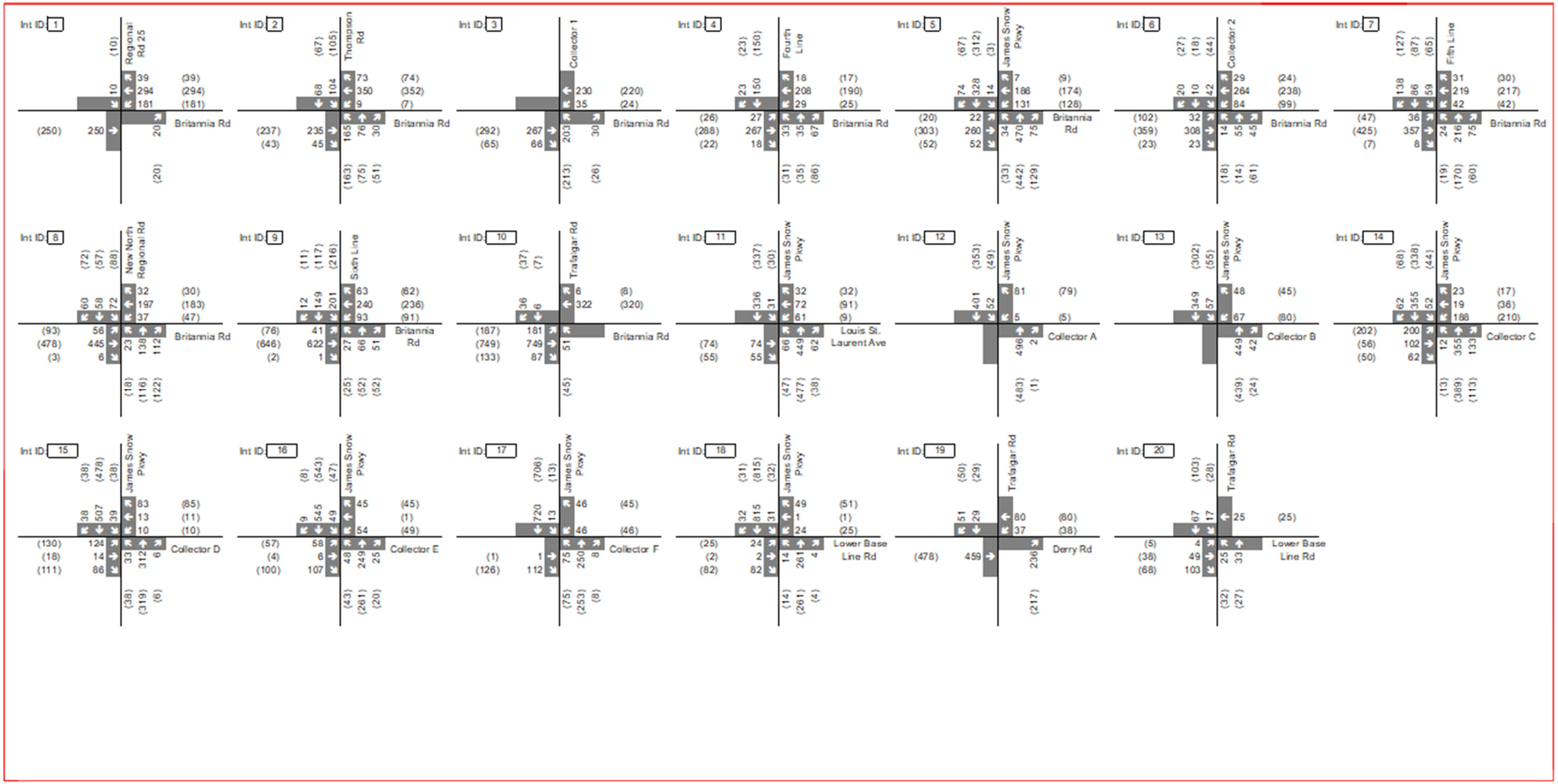


Figure 5.9: BSPA Development Trip Assignment



Legend

xx AM Peak Hour Traffic Volumes

(xx) P.M. Peak Hour Traffic Volumes

Development Trip Assignment

Britannia Seconday Plan

Town of Milton

Figure 5.10: Study Intersections for Future Total Conditions

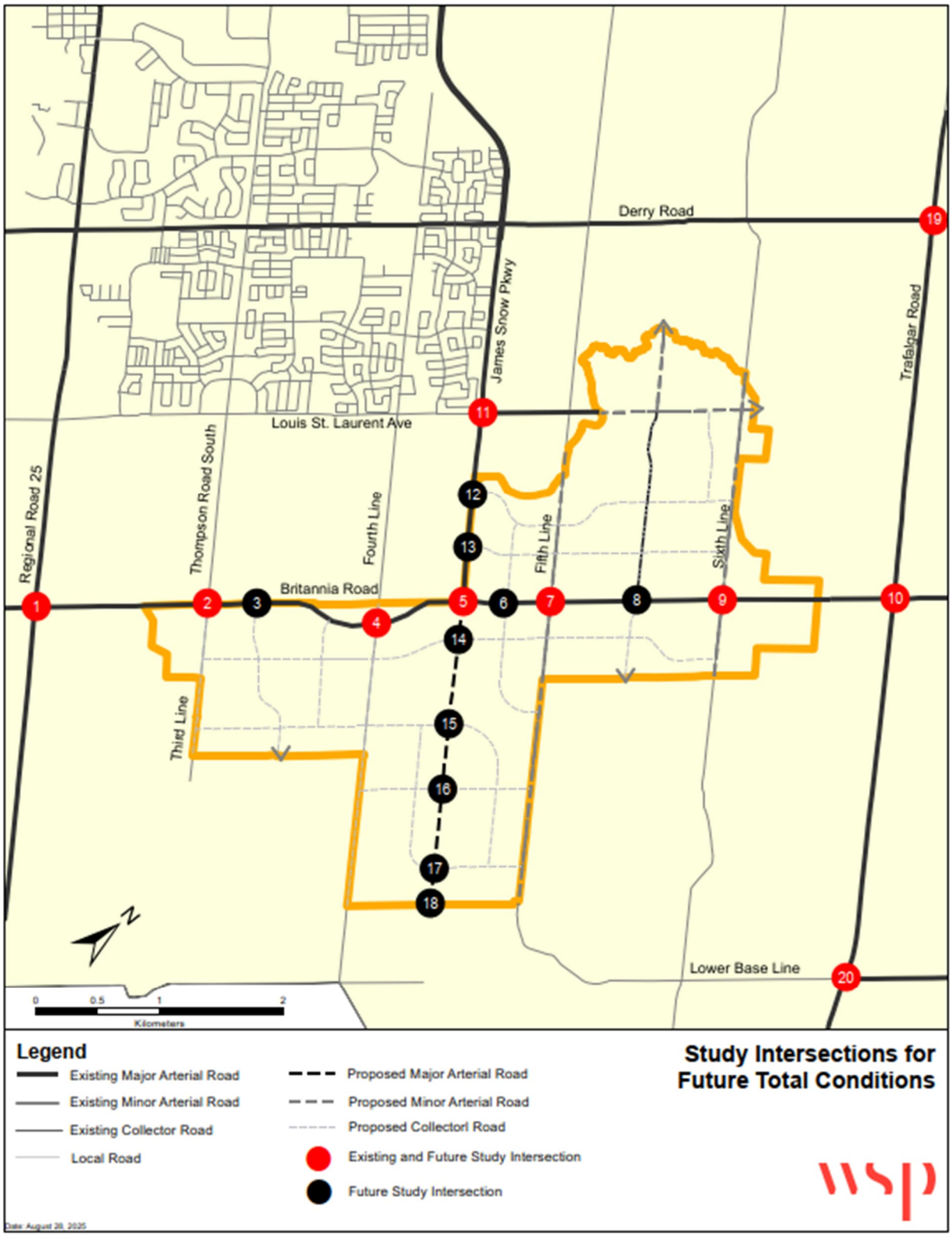


Figure 5.11: Future Total Lane Configurations

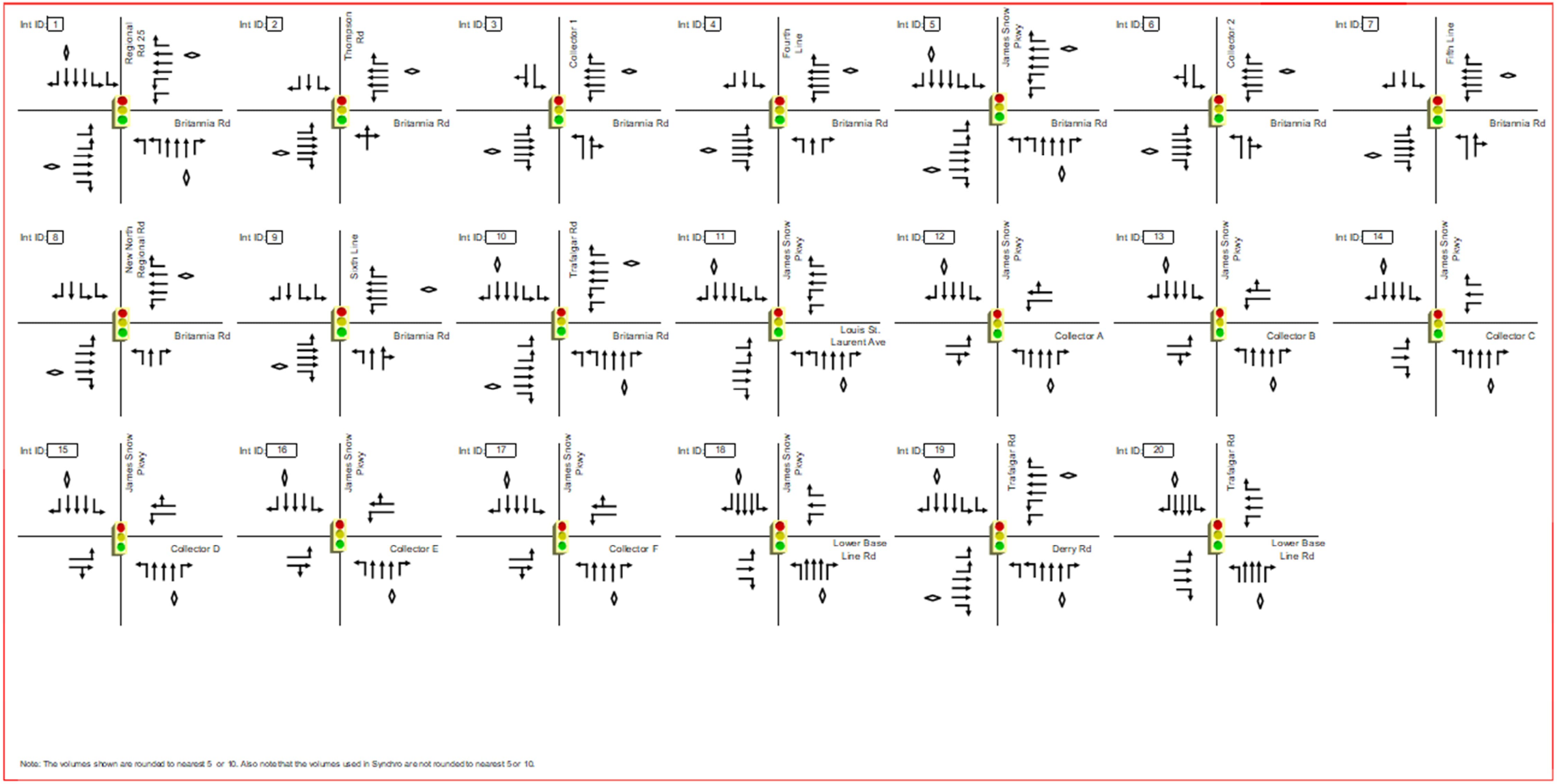
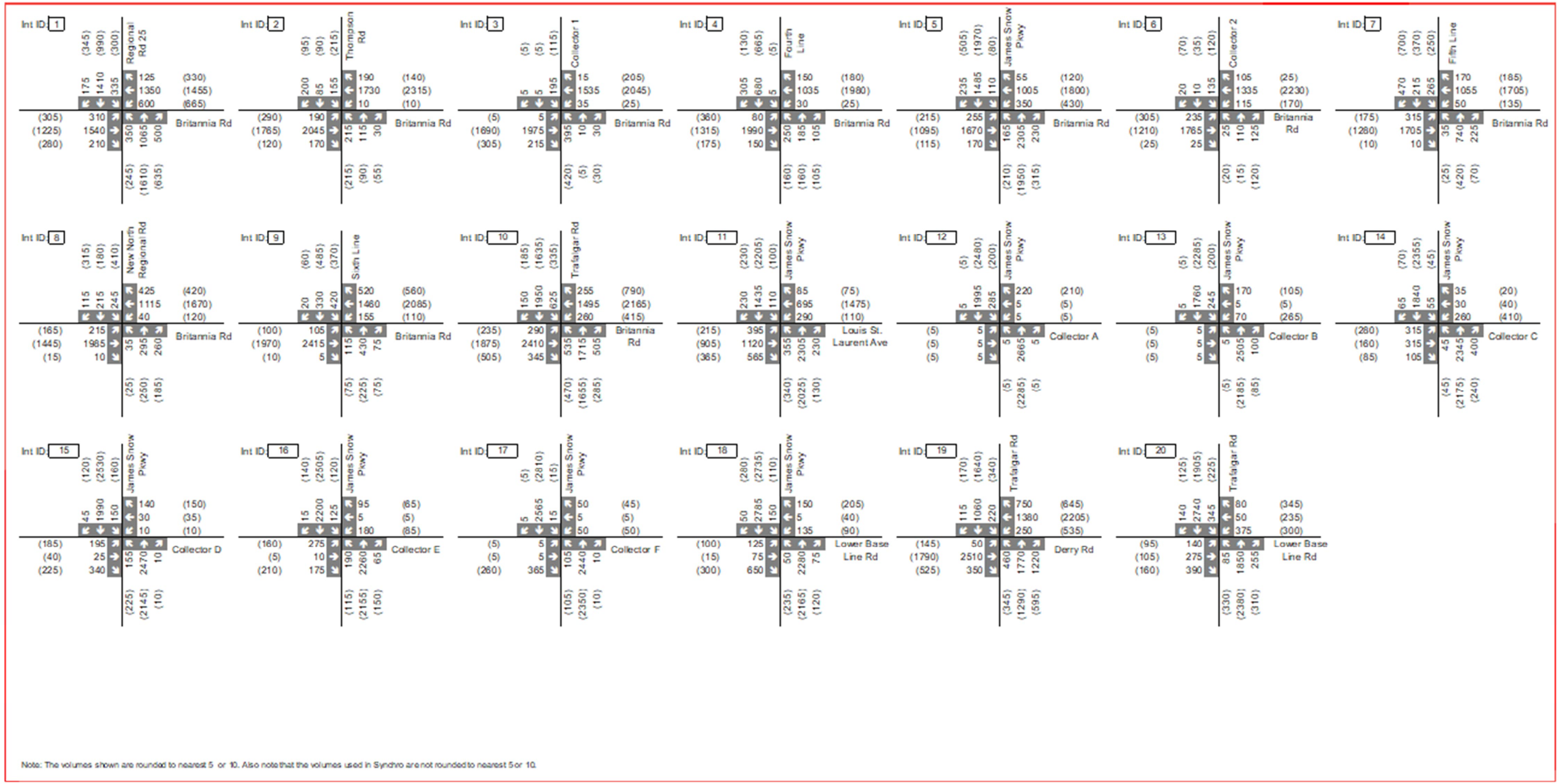


Figure 5.12: Future Total Traffic Volumes



Note: The volumes shown are rounded to nearest 5 or 10. Also note that the volumes used in Synchro are not rounded to nearest 5 or 10.

Legend

xx AM Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes

Future Total Traffic Volumes
Britannia Seconday Plan
Town of Milton

Intersection Capacity Analysis

The intersection capacity analysis for the future total conditions is presented in **Table 5.6**. Similar to the future background conditions analysis, a summary of the overall intersection and critical movements are presented with a focus on performance measures such as LOS, v/c ratios, and delay. All signal timing plans were optimized for both splits and cycle lengths. Detailed Synchro output sheets are provided in **Appendix F**.

Table 5.6: Intersection Capacity Analysis – Future Total Conditions

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	Overall V/C Max V/C Through Overall LOS (Delay in Seconds)	Critical Movement (V/C) (LOS)	Overall V/C Max V/C Through Overall LOS (Delay in Seconds)	Critical Movement (V/C) (LOS)
1. Britannia Road and Regional Road 25	Overall 1.07 EBT (1.09) E (74)	EBT (1.09) (F) WBL (1.10) (F) NBL (1.03) (F) SBL (0.99) (F) SBT (1.04) (F)	Overall 1.03 NBT (1.07) E (66)	EBT (0.94) (E) WBL (1.08) (F) WBT (0.87) (D) NBT (1.07) (F) SBL (1.05) (F)
2. Britannia Road and Thompson Road	Overall 0.84 EBT (0.84) C (26)	-	Overall 1.07 WBT (0.97) D (43)	EBL (1.11) (F) WBT (0.97) (D) NBT (0.95) (F)
3. Britannia Road and Collector 1	Overall 0.80 EBT (0.83) B (18)	-	Overall 0.86 WBT (0.89) C (25)	WBT (0.89) (C)
4. Britannia Road and Fourth Line	Overall 1.26 EBT (1.19) F (94)	EBT (1.19) (F) NBL (1.39) (F)	Overall 1.21 WBT (1.16) F (88)	EBL (1.27) (F) WBT (1.16) (F) NBL (1.17) (F) SBT (1.03) (F)
5. Britannia Road and James Snow Parkway	Overall 1.14 NBT (1.21) F (92)	EBT (1.07) (F) WBL (1.16) (F) NBT (1.21) (F)	Overall 1.08 SBT (1.09) E (78)	EBL (0.99) (F) EBT (0.86) (E) WBT (1.07) (F) NBL (0.99) (F) NBT (1.03) (E) SBT (1.09) (F)
6. Britannia Road and Collector 2	Overall 0.76 EBT (0.68) C (20)	SBL (0.98) (F)	Overall 0.85 WBT (0.89) C (29)	WBT (0.89) (C)
7. Britannia Road and Fifth Line	Overall 1.36 NBT (1.32) F (103)	EBL (1.44) (F) EBT (1.03) (E) NBT (1.32) (F) SBL (1.35) (F)	Overall 0.99 WBT (1.03) D (49)	EBL (1.04) (F) WBT (1.03) (E) SBL (0.92) (E)
8. Britannia Road and New North Regional Road	Overall 0.80 EBT (0.84) C (34)	-	Overall 0.86 WBT (0.76) D (37)	EBL (0.94) (F) SBL (0.95) (F)
9. Britannia Road and Sixth Line	Overall 0.98 EBT (1.01) E (59)	EBT (1.01) (E) WBL (1.09) (F) SBL (1.09) (F)	Overall 0.85 EBT (0.91) D (55)	EBT (0.91) (C) WBT (0.89) (C) SBL (0.90) (E)
10. Britannia Road and Trafalgar Road	Overall 1.38 EBT (1.35) F (173)	EBT (1.35) (F) WBL (1.19) (F) WBT (0.97) (E) NBL (1.71) (F) NBT (1.19) (F) SBL (1.81) (F) SBT (1.31) (F)	Overall 1.20 WBT (1.20) F (118)	EBL (1.10) (F) EBT (1.12) (F) WBL (1.32) (F) WBT (1.20) (F) WBR (1.05) (F) NBL (1.30) (F) NBT (1.07) (F)

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	Overall V/C Max V/C Through Overall LOS (Delay in Seconds)	Critical Movement (V/C) (LOS)	Overall V/C Max V/C Through Overall LOS (Delay in Seconds)	Critical Movement (V/C) (LOS)
				SBL (1.15) (F) SBT (1.12) (F)
11. James Snow Parkway and Louis St. Laurent Avenue	Overall 1.07 NBT(1.33) F (100)	EBT (0.87) (D) NBL (1.06) (F) NBT (1.33) (F) SBT (0.98) (E)	Overall 1.18 SBT (1.50) F (167)	WBT (1.03) (F) NBL (1.77) (F) NBT (0.98) (E) SBL (1.12) (F) SBT (1.15) (F)
12. James Snow Parkway and Collector A	Overall 0.85 NBT (0.97) B (19)	NBT (0.97) (C)	Overall 0.72 NBT (0.78) B (19)	-
13. James Snow Parkway and Collector B	Overall 0.78 NBT (0.85) C (32)	NBT (0.85) (D)	Overall 0.85 NBT (0.95) C (28)	NBT (0.95) (D)
14. James Snow Parkway and Collector C	Overall 0.99 NBT (0.94) D (41)	WBL (1.26) (F) NBT (0.94) (D)	Overall 0.98 SBT (0.89) D (43)	WBL (1.38) (F) SBT (0.89) (C)
15. James Snow Parkway and Collector D	Overall 0.90 NBT (0.91) C (30)	NBT (0.91) (C)	Overall 0.97 SBT (0.95) D (38)	EBL (0.94) (F) NBL (0.99) (F) SBT (0.95) (D)
16. James Snow Parkway and Collector E	Overall 0.89 NBT, SBT (0.93) C (31)	NBT (0.93) (C) SBT (0.93) (C)	Overall 0.83 SBT (0.87) C (23)	SBT (0.87) (C)
17. James Snow Parkway and Collector F	Overall 0.88 SBT (0.92) C (27)	SBT (0.92) (C)	Overall 0.87 SBT (0.92) C (25)	SBT (0.92) (C)
18. James Snow Parkway and Lower Base Line Road	Overall 1.12 SBT (1.11) E (74)	EBR (1.17) (F) NBT (0.96) (D) SBT (1.11) (F)	Overall 1.01 SBT (1.03) D (43)	NBL (1.11) (F) SBT (1.03) (D)
19. Trafalgar Road and Derry Road	Overall 1.58 EBT (1.35) F (165)	EBT (1.35) (F) NBL (1.71) (F) NBT (1.28) (F) NBR (1.77) (F) SBL (1.08) (F)	Overall 1.19 SBT (1.16) F (97)	EBT (1.08) (F) WBL (1.24) (F) WBT (1.11) (F) NBL (1.30) (F) NBT (0.99) (E) SBL (0.94) (F) SBT (1.16) (F)
20. Trafalgar Road and Lower Base Line	Overall 1.16 SBT (1.10) E (74)	WBL (1.23) (F NBT (0.93) (D) SBL (1.07) (F) SBT (1.10) (F)	Overall 0.98 NBT (0.94) D (44)	NBT (0.94) (D) SBL (1.04) (F) SBT (0.88) (D)

Under future total conditions in 2051, after the addition of the BSPA development roadway network and traffic, most of the analyzed intersections are expected to operate at above the capacity during the a.m. and p.m. peak hours. The intersections that were not performing well in the future background conditions continue to operate at poor LOS.

The intersections of the new collector roadway network with the arterial intersections operate at with overall v/c ratios around 0.85, except for some intersections on James Snow Parkway south of Britannia Road which operate at near capacities with v/c ratios closer to 1.

Future Total Sensitivity Analysis

Similar to the sensitivity analysis conducted for the future background conditions, a sensitivity analysis for the future total conditions was conducted as most of the intersections were operating at or above capacity. The sensitivity analysis for the future total conditions was conducted by adding the full BSPA development traffic to the 15% reduced future background volumes assumed in the future background sensitivity analysis. BSPA development traffic was not reduced by 15%, as the mode share assumption for the BSPA already accounted for work from home trips. The same lane configurations were assumed as in the future background conditions as shown in **Figure 5.2**.

The results of the intersection capacity analysis for the future total sensitivity analysis conditions is presented in **Table 5.7**. Detailed Synchro output sheets are provided in **Appendix E**. As shown in the table, with the reduction in traffic volumes, many intersections in the BSPA are expected to operate below or near capacity with overall v/c ratios less than 1.0, except for:

- Britannia Road and Fourth Line, which operates with a v/c ratio of 1.01 in the p.m. peak hour.
- Britannia Road and James Snow Parkway, which operates with a v/c ratio of 1.01 in the a.m. peak hour.
- Britannia Road and Fifth Line, which operates with a v/c ratio of 1.18 in the a.m. peak hour.
- Britannia Road and Trafalgar Road, which operates with a v/c ratio of 1.23 and 1.07 in the a.m. and p.m. peak, respectively.
- James Snow Parkway and Louis St. Laurent Avenue, which operates with a v/c ratio of 1.03 in the p.m. peak hour.
- James Snow Parkway and Lower Base Line, which operates with a v/c ratio of 1.01 in the a.m. peak hour.
- Trafalgar Road and Derry Road, which operates with a v/c ratio of 1.39 and 1.01 in the a.m. and p.m. peak, respectively.

The results of this analysis show improved conditions compared to the regular future total conditions analysis, although many intersections remain above capacity. This re-confirms the need to maintain / incent work from home policies, and promote the use of sustainable transportation modes, to reduce overall car volumes on the network across Milton.

Table 5.7: Intersection Capacity Analysis – Future Total Conditions - Sensitivity

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	Overall V/C Max V/C Through Overall LOS (Delay in Seconds)	Critical Movement (V/C) (LOS)	Overall V/C Max V/C Through Overall LOS (Delay in Seconds)	Critical Movement (V/C) (LOS)
1. Britannia Road and Regional Road 25	Overall 0.93 EBT (0.95) D (54)	EBT (0.95) (E) WBL (0.98) (F) SBT (0.89) (D)	Overall 0.89 NBT (0.91) D (50)	WBL (0.96) (F) NBT (0.91) (D) SBL (0.89) (F)
2. Britannia Road and Thompson Road	Overall 0.77 NBT (0.78) C (22)	-	Overall 0.91 NBT (0.91) C (34)	EBL (0.89) (E) NBT (0.91) (E)
3. Britannia Road and Collector 1	Overall 0.74 EBT (0.74) B (16)	-	Overall 0.75 WBT (0.67) B (18)	-

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	Overall V/C Max V/C Through Overall LOS (Delay in Seconds)	Critical Movement (V/C) (LOS)	Overall V/C Max V/C Through Overall LOS (Delay in Seconds)	Critical Movement (V/C) (LOS)
4. Britannia Road and Fourth Line	Overall 0.97 EBT (0.97) D (54)	EBT (0.97) (E) NBL (1.02) (F)	Overall 1.01 SBT (1.01) D (53)	EBL (1.05) (F) WBT (0.97) (E) NBL (0.95) (F) SBT (1.01) (F)
5. Britannia Road and James Snow Parkway	Overall 1.01 NBT (1.04) E (63)	EBT (1.02) (E) WBL (0.98) (F) NBT (1.04) (E)	Overall 0.97 SBT (0.98) E (57)	EBL (0.90) (F) WBT (0.94) (E) NBL (0.91) (F) NBT (0.95) (D) SBT (0.98) (E)
6. Britannia Road and Collector 2	Overall 0.62 EBT (0.60) B (15)	-	Overall 0.76 WBT (0.66) B (17)	-
7. Britannia Road and Fifth Line	Overall 1.18 NBT (1.15) E (76)	EBL (1.19) (F) EBT (0.99) (E) NBT/R (1.15) (F) SBL (1.20) (F)	Overall 0.91 WBT (0.85) D (36)	SBL (0.98) (F)
8. Britannia Road and New North Regional Road	Overall 0.78 EBT (0.83) C (34)	-	Overall 0.65 EBT,WBT (0.60) C (28)	
9. Britannia Road and Sixth Line	Overall 0.82 EBT (0.87) D (37)	EBT (0.87) (C)	Overall 0.78 EBT (0.82) C (30)	
10. Britannia Road and Trafalgar Road	Overall 1.23 SBT (1.22) F (125)	EBT (1.21) (F) WBL (1.03) (F) WBT (0.88) (D) NBL (1.48) (F) NBT (1.03) (F) SBL (1.44) (F) SBT (1.22) (F)	Overall 1.07 WBT (1.09) F (82)	EBL (1.02) (F) EBT (1.06) (F) WBL (1.04) (F) WBT (1.09) (F) NBL (1.06) (F) NBT (0.90) (D) SBL (0.99) (F) SBT (1.03) (F)
11. James Snow Parkway and Louis St. Laurent Avenue	Overall 0.95 NBT(1.12) E (67)	NBT (1.12) (F)	Overall 1.03 SBT (1.29) F (112)	WBT (0.90) (D) NBL (1.39) (F) NBT (1.17) (E) SBT (1.29) (F)
12. James Snow Parkway and Collector A	Overall 0.76 NBT (0.80) B (11)	-	Overall 0.59 NBT (0.64) A (10)	-
13. James Snow Parkway and Collector B	Overall 0.76 NBT (0.80) C (29)	-	Overall 0.81 NBT (0.88) C (23)	NBT (0.88) (C)
14. James Snow Parkway and Collector C	Overall 0.85 NBT (0.83) C (32)	WBL (1.06) (F)	Overall 0.83 SBT (0.78) C (32)	WBL (1.12) (F)
15. James Snow Parkway and Collector D	Overall 0.86 NBT (0.86) C (29)	NBT (0.86) (C)	Overall 0.82 SBT (0.83) C (26)	-
16. James Snow Parkway and Collector E	Overall 0.88 SBT (0.91) C (30)	NBT (0.89) (C) SBT (0.91) (C)	Overall 0.80 SBT (0.81) C (21)	-
17. James Snow Parkway and Collector F	Overall 0.74 SBT (0.78) B (11)	-	Overall 0.80 SBT (0.81) B (17)	-

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	Overall V/C Max V/C Through Overall LOS (Delay in Seconds)	Critical Movement (V/C) (LOS)	Overall V/C Max V/C Through Overall LOS (Delay in Seconds)	Critical Movement (V/C) (LOS)
18. James Snow Parkway and Lower Base Line Road	Overall 1.01 SBT (1.03) D (52)	EBR (1.01) (F) SBT (1.03) (E)	Overall 0.83 SBT (0.90) C (27)	SBT (0.90) (C)
19. Trafalgar Road and Derry Road	Overall 1.39 EBT (1.17) F (115)	EBT (1.17) (F) NBL (1.46) (F) NBT (1.09) (F) NBR (1.58) (F)	Overall 1.01 SBT (1.03) E (63)	EBT (1.00) (E) WBL (1.01) (F) WBT (0.95) (D) NBL (1.01) (F) SBT (1.03) (F)
20. Trafalgar Road and Lower Base Line	Overall 0.96 SBT (0.89) D (41)	WBL (1.23) (F SBT (0.89) (C)	Overall 0.83 NBT (0.81) C (31)	-

Queueing Analysis

The queueing results from the Synchro model were summarized for exclusive movements with storage lanes for the future total and future total sensitivity conditions, to help determine the storage lengths required for the turn lanes in the future. **Table 5.8** shows the summary of the 95th percentile queues for the future total and sensitivity scenarios. Queues for all movements can be found in the Synchro output sheets, which are provided in **Appendix F.**

Table 5.8: Intersection Queueing Analysis – Future Total Conditions

Intersection	Turning Movement	Future Total 95th Percentile Queue (m)		Future Total Sensitivity 95th Percentile Queue (m)	
		A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour
1. Britannia Road and Regional Road 25	EBL	#62	#69	50	#54
	EBR	29	48	21	32
	WBL	#129	#139	#111	#117
	WBR	13	56	12	42
	NBL	#82	#51	#65	41
	NBR	110	#168	79	108
	SBL	#77	#73	#62	#59
	SBR	17	53	15	36
2. Britannia Road and Thompson Road South / Third Line	EBL	#63	#135	#48	#98
	EBR	15	8	11	9
	WBL	3	2	3	3
	WBR	13	18	12	17
	SBL	39	86	37	77
	SBR	25	13	18	9
3. Britannia Road and Collector 1	EBL	3	2	130	129
	EBR	11	15	10	-
	WBL	#16	6	#15	8
	WBR	3	16	2	10
	NBL	79	#111	75	96
	SBL	35	28	30	24
4. Britannia Road and Fourth Line	EBL	27	#168	23	#136
	EBR	31	13	22	13
	WBL	11	10	m10	10
	WBR	25	27	m23	25
	NBL	#153	#87	#109	#66
	NBR	7	2	6	0

Intersection	Turning Movement	Future Total 95th Percentile Queue (m)		Future Total Sensitivity 95th Percentile Queue (m)	
		A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour
	SBL	3	4	-	-
	SBR	34	8	36	0
5. Britannia Road and James Snow Parkway	EBL	27	#61	m35	#52
	EBR	16	0	m26	0
	WBL	#95	#89	#79	#77
	WBR	0	9	0	9
	NBL	#41	#59	39	#63
	NBR	39	47	32	37
	SBL	#32	21	#33	21
	SBR	55	129	35	114
6. Britannia Road and Collector 2	EBL	42	#105	17	64
	EBR	0	1	0	1
	WBL	21	19	19	13
	WBR	10	0	8	0
	NBL	9	12	9	12
	SBL	#47	52	39	49
7. Britannia Road and Fifth Line	EBL	#160	#63	#112	#39
	EBR	0	0	0	0
	WBL	19	#41	18	#31
	WBR	16	15	15	13
	NBL	10	7	10	7
	SBR	44	#187	32	#140
8. Britannia Road and New North Regional Road	EBL	49	#71	44	#41
	EBR	0	0	0	0
	WBL	12	32	13	23
	WBR	29	34	18	20
	NBL	19	14	19	13
	NBR	38	10	28	16
	SBR	0	51	0	44
9. Britannia Road and Sixth Line	EBL	#35	#29	26	18
	EBR	0	0	0	0
	WBL	#85	#37	#53	#34
	WBR	64	63	41	40
	NBL	#61	#39	#66	#34
	SBL	#106	#79	#65	#65
	SBR	0	0	0	0
10. Britannia Road and Trafalgar Road	EBL	#68	#66	#67	#70
	EBR	71	122	61	89
	WBL	#74	#112	#62	#88
	WBR	42	#288	34	#234
	NBL	#151	#123	#128	#113
	NBR	#158	60	120	38
	SBL	#176	#89	#142	#72
	SBR	21	37	11	34
11. James Snow Parkway and Louis St. Laurent Avenue	EBL	70	43	62	38
	EBR	148	69	117	55
	WBL	#62	26	#56	26
	WBR	0	0	0	0
	NBL	#89	#106	#76	#89
	NBR	43	17	43	22
	SBL	#29	#26	22	#27
	SBR	34	42	25	31
	EBL	6	5	-	-

Intersection	Turning Movement	Future Total 95th Percentile Queue (m)		Future Total Sensitivity 95th Percentile Queue (m)	
		A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour
12. James Snow Parkway and Collector A	WBL	5	5	5	6
	NBL	1	2	-	-
	NBR	0	0	m0	0
	SBL	95	67	79	39
	SBR	0	0	-	-
13. James Snow Parkway and Collector B	EBL	6	3	-	-
	WBL	35	74	54	75
	NBL	1	2	-	-
	NBR	10	10	m22	11
	SBL	91	#68	94	#66
	SBR	0	0	-	-
14. James Snow Parkway and Collector C	EBL	95	89	92	#113
	EBR	14	11	15	15
	WBL	#99	#156	#70	#114
	WBR	0	0	0	0
	NBL	10	9	10	8
	NBR	46	23	35	18
	SBL	14	9	13	8
	SBR	4	6	4	4
15. James Snow Parkway and Collector D	EBL	#77	#95	70	76
	WBL	7	8	7	8
	NBL	#53	#106	#60	#61
	NBR	0	0	0	0
	SBL	#63	#61	#32	38
	SBR	5	15	0	4
16. James Snow Parkway and Collector E	EBL	79	54	79	49
	WBL	53	#40	#88	#48
	NBL	#69	29	#38	31
	NBR	7	12	0	9
	SBL	#38	29	#38	28
	SBR	0	13	0	12
17. James Snow Parkway and Collector F	EBL	4	5	-	-
	WBL	#30	#32	21	#33
	NBL	#39	#45	15	24
	NBR	0	0	0	0
	SBL	3	3	2	3
	SBR	0	0	-	-
18. James Snow Parkway and Lower Base Line Road	EBL	44	35	45	34
	EBR	#287	77	#231	54
	WBL	48	33	10	18
	WBR	35	39	36	48
	NBL	11	#118	9	#88
	NBR	12	14	10	10
	SBL	#71	#37	#60	35
	SBR	7	35	9	31
19. Trafalgar Road and Derry Road	EBL	13	#38	11	#31
	EBR	63	136	68	101
	WBL	#55	#134	#46	#109
	WBR	210	153	152	119
	NBL	#126	#96	#106	#84
	NBR	#538	181	#465	158
	SBL	#59	#80	#49	#63
	SBR	14	27	11	22

Intersection	Turning Movement	Future Total 95th Percentile Queue (m)		Future Total Sensitivity 95th Percentile Queue (m)	
		A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour
20. Trafalgar Road and Lower Base Line	EBL	46	34	41	30
	EBR	#127	18	56	17
	WBL	#193	99	#133	85
	WBR	2	79	0	61
	NBL	#31	#147	19	#75
	NBR	40	46	31	34
	SBL	#161	#113	#117	#83
	SBR	20	14	21	9

Notes:

 # – Volume for the 95th percentile cycle exceeds capacity.

m – metered by upstream intersection.

[1]The storage lengths presented are assumed, they will be confirmed through the TIS process.

**Right-in & Right-out stop-controlled intersection. The storage lengths are provided for main lane right turning movements.*

Red results represent movements exceeding storage lengths.

Recommendations

The results of the future background and total conditions capacity analyses highlight that most of the analyzed intersections will operate at or over capacity, even when dual turn lanes are assumed. Most of the deterioration of intersection performance can be explained by the large background volumes that are expected on the network, rather than as a result of BSPA traffic alone, as shown by the high v/c ratios in the future background conditions.

Intersection operations at Britannia Road and Thompson Road can be improved by adding additional right and left turn lanes on the south approach on Thompson Road in the future total conditions. Operations at Fifth Line and Britannia Road can be improved by having two-northbound through lanes, as well as northbound left and right turn lanes. The Town is undertaking detailed design of the widening of Fifth Line, including designing intersections. **Table 5.9** shows results of a capacity analysis at the two intersections with the identified improvements.

Table 5.9: Intersection Capacity Analysis with Improvements– Future Total Conditions

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	Overall V/C Max V/C Through	Critical Movement	Overall V/C Max V/C Through	Critical Movement
	Overall LOS (Delay in Seconds)	(V/C) (LOS)	Overall LOS (Delay in Seconds)	(V/C) (LOS)
2. Britannia Road and Thompson Road	Overall 0.75	-	Overall 0.99	EBL (1.05) (F) WBT (0.91) (C)
	EBT (0.77)		WBT (0.91)	
	B (20)		C (33)	
7. Britannia Road and Fifth Line	Overall 0.95	EBT (0.86) (D) SBL (1.00) (F)	Overall 0.96	EBL (1.04) (F) WBT (1.03) (E)
	EBT (0.86)		WBT (1.03)	
	D (103)		D (46)	

The sensitivity analyses show that, if background volumes were to be 15% lower than forecast, for example due to continued working from home, or as a result of higher active transportation and transit mode share, intersection performance would improve significantly. It is therefore recommended that:

- Town-wide efforts are undertaken to reduce overall vehicle volumes in Milton by investing in active transportation and transit, and creating effective TDM policies that would incent work from home, transit, active transportation, and carpooling. The Town may also wish to consider land use changes that would bring job locations closer to homes, to reduce the number and length of car trips and thereby reduce pressures on the examined intersections. These improvements will be required as intersection infrastructure improvements alone were found to not be sufficient to improve intersection performance beyond the Region's critical thresholds.
- Transit and active transportation facilities, and appropriate transportation demand management measures, be in place in line with the rate of development in the BSPA to foster sustainable transportation choices and reduce overall trip generation.
- Right-of-way requirements for all dual left-turn lanes be protected now and the intersections be monitored regularly through the Region's Traffic Count Program and be further considered in future Municipal Class Environmental Assessment Studies to determine if the additional lanes are necessary.

Given that the results suggest that many of the intersections will not meet the Regional criteria and operate over capacity, even with 15% reduced background volumes, all Britannia Tertiary Plan Transportation Studies will need to refine the level of analysis and reassess the recommendations to confirm if additional transportation infrastructure is required to support the development in the area. Specifically, the Tertiary Plan Roads Needs Assessment for the Britannia Secondary Plan Area should:

1. **Collect new traffic count data and reconfirm existing conditions**: Traffic patterns have "normalized" since the pandemic and new traffic count data should be collected and analyzed for study area intersections.
2. **Use Halton Region ABM to determine future background traffic**: Similar to the Britannia TMP, the Region's ABM should be used to extract future background traffic volumes on road links in the study area.
3. **Report the land uses**: The Britannia TMP used the Secondary Plan land uses to generate trips. The Tertiary Plan RNA should determine if there are any refinements or updates to the land uses and report the land uses being considered in the Tertiary Plan.
4. **Divide the Regional EMME Model Traffic Analysis Zones**: create sub zones that can reflect a more detailed trip generation and assignment method.
5. **Confirm the modal split for Britannia trips**: The modal split used in the Britannia TMP is an aspirational 33% for the ultimate build out of the full Secondary Plan Area, assumed to be in the year 2051. This aspirational goal incorporates expected future advances in transit, introduction of Regional transit, expansion of Milton Transit, continued adoption of work from home several days a week, and other travel demand management measures.

   The RNA should identify and propose all reasonable measures that may be implemented in order to support a shift towards the modal split used in the Britannia TMP. This could include:
   - **Active transportation**: Wider sidewalks, wider cycling facilities, additional connections for active transportation; active transportation supports such as

requirements for secure bike parking, locker room and shower facilities at businesses, and other items.

- **Transit**: Additional buses to accommodate shorter headways and provide capacity for additional riders; transit priority measures such as queue jump lanes, dedicated transit lanes; additional facilities to service and store the additional buses; introduction of Regional bus service; expansion of existing bus services; introduction of higher order transit such as Light Rail Transit (LRT); and any other measures.
- **Road classifications**: Changes to road classification to accommodate more space for sustainable travel; modifications to existing road classifications to accommodate more space for more sustainable travel.
- **Travel demand management**: Any other measures.

The expected modal split that can be reasonably assumed for Britannia trips in the Tertiary Plan RNA must be documented and justified. The modal split for Britannia-generated trips should be confirmed with the Region and Town prior to further analysis.

6. **Present the distribution of trips**: The distribution of Britannia trips should be documented with a rationale given for how it was determined.
7. **Assign trips to the network**: Document the assignment of vehicle trips to the road network.
8. **Conduct the intersection analysis**: Analyze future conditions and provide conclusions and recommendations in the RNA report.
9. **Establish a coordinated Staging and Monitoring Plan**: Ensure that Regional roads, including James Snow Parkway and Britannia Road, function efficiently as major routes through the Secondary Plan area (results will need to conform to criteria established in the Region's Transportation Impact Study Guidelines) based on Planning horizons.
10. **As part of the Staging and Monitoring Plan, develop an Access Management Strategy**: Ensure interim and ultimate access during implementation is achieved through landowner coordination and in conformity with the Region's Access Management Guideline and By-law 32-17 and Secondary Plan.
11. **Determine lane configurations at intersections**: at Town minor arterial and collector road intersections and Town minor arterial and collector road intersections with Regional roads, recommend interim and ultimate intersection configurations (before and after Town and Regional road capital improvements), as part of the Staging and Monitoring Plan.

As an outcome of the analysis, the Town requires that the Tertiary Plan RNA report:

- **Road classification and right-of-way**: The road classification, based on the classification presented in the Town's TMP, needs to be reconfirmed for all Town roads. The right-of-way, also based on the Town's TMP, needs to be stated for all Town roads. This is expected to be the ultimate right-of-way needed at full build out of the Britannia Secondary Plan Area.
    a. Indicate if road classifications need to be changed to accommodate more space for more sustainable modes of travel. Indicate if travel lanes need to be

repurposed from general purpose lanes to other types of lanes or facilities for other sustainable travel modes.

- **Intersection controls and lane configurations**: The type of intersection control (stop, roundabout, signals, and so forth) needs to be confirmed and the lane configurations need to be documented. The lane configurations need to be able to fit within the right-of-way for the confirmed road classification.
- **Transit infrastructure to meet modal split**: The number of additional buses or other infrastructure needed to be able to accommodate passengers using transit.
    a. Indicate how public transit can be made more affordable and more convenient than the private automobile for travel for Britannia-related trips. Indicate what infrastructure and other measures are required to be able to achieve the mode split used for Britannia-related trips, from additional buses to the introduction of higher order transit, dedicated transit lanes, and any other infrastructure and measures.

- **Transportation infrastructure requirements for walking, cycling, and vehicular travel:** Based on the road classification, the walking (sidewalks, multi-use paths), cycling (dedicated cycling facilities, multi-use paths), and vehicle requirements (number of lanes) need to be stated.
    a. Indicate any enhancements to the walking and cycling network that are required to achieve the mode split used for Britannia-related trips. Indicate if any other travel demand measures are needed to achieve the mode split for Britannia-related trips.

Each individual Subdivision application (subject to a terms of reference completed to the Town and Region's satisfaction) would be required to reconfirm these recommendations can accommodate the final subdivision plans.

5.4 Active Transportation Network

The proposed active transportation network as shown in **Figure 5.13** is consistent with both the Region's and Town's guidelines. All arterial roads within the BSPA include in-boulevard multi-use trails (or multi-use paths - MUPs) on both sides, in line with current Region policies and existing infrastructure. In addition, this arrangement (in-boulevard multi-use trails on both sides) is recommended for the proposed New North Regional Road. The New North Regional Road route is intended to increase non-car mode share as it is connected to a proposed local retail / service node in the BSPA. Halton Region has initiated an Environmental Assessment to study this road corridor.

Cycle tracks or separated bicycle lanes are proposed along all collector roads. These facilities provide connectivity from the retail / service roads to the residential areas within the BSPA. A separated bicycle lane is also proposed along Lower Base Line as a continuation of the already existing bike lane. As a result, the proposed active transportation network provides key north-south and east-west linkages, provides accessible routes that reach points of interests, and establishes routes that benefit future development areas. Multi-use paths, cycle tracks, and separated bicycle lanes should be provided as detailed in the Town's Engineering and Parks Standards Manual.

The recommended cycling facilities should be revisited in the detailed design stage to confirm the appropriateness of the facilities. The most up-to-date version of Ontario Traffic Manual Book 18: Cycling Facilities, should be consulted to help guide the selection of the appropriate facility type.

The proposed active transportation facilities also serve as a connection to trails within the Greenbelt Natural Heritage System and the BSPA proposed trails. The Greenbelt Natural Heritage System (NHS) is defined within the Halton Regional Official Plan, which states that development will be prohibited and site alteration restricted within the key features of the NHS.

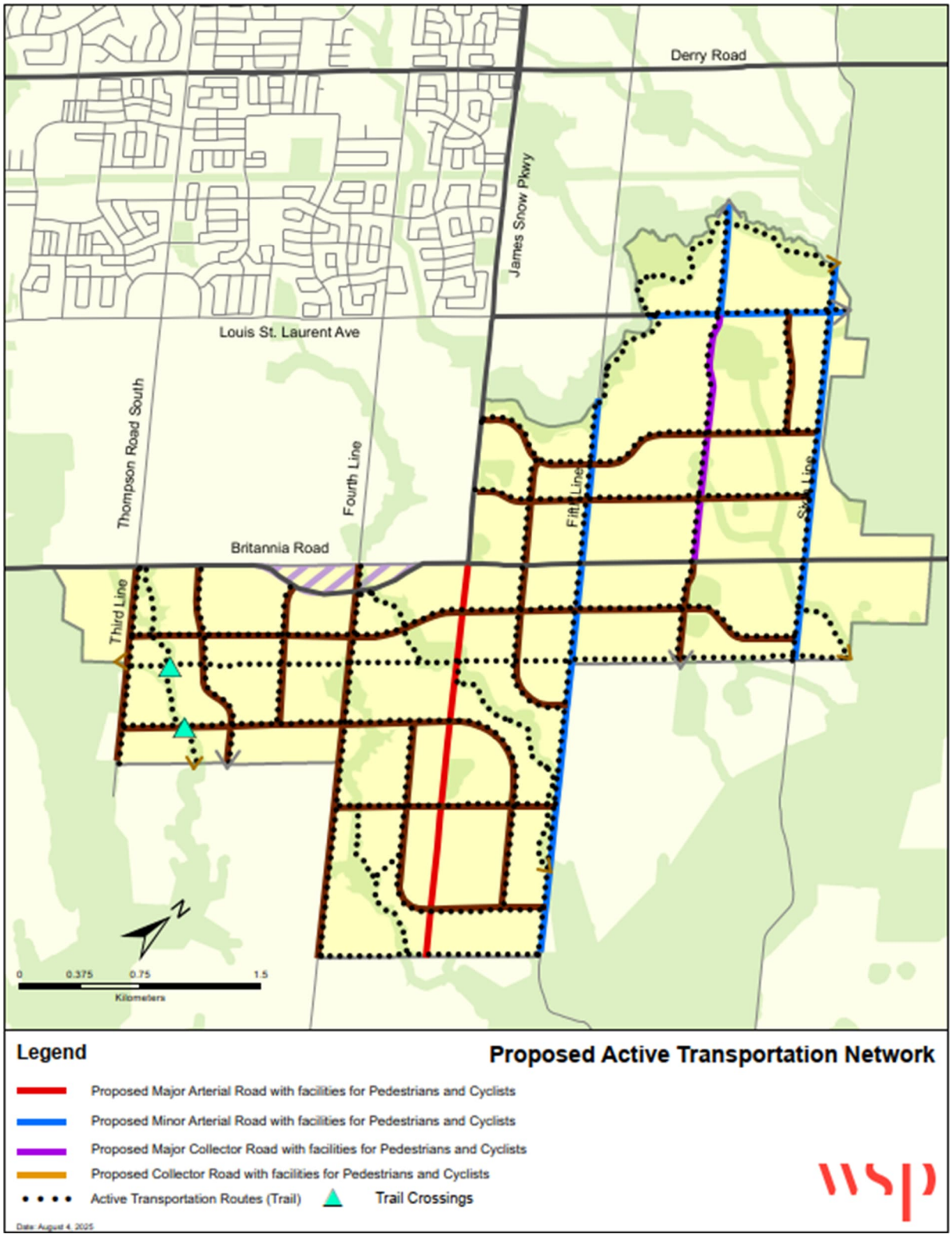
The proposed trails/MUPs in the BSPA are conceptual in nature and have been developed at a high level to increase connectivity within the BSPA. A detailed study to confirm the location of these trails has not been conducted at this time. The trails shown reflect "desire lines" and have been identified in an effort to promote active transport access to and through the natural areas in this part of Milton.

Trail crossings of roads, particularly high vehicle volume arterial roads, will need to be studied in greater detail as projects move closer to implementation. Trails may need to utilize the in-boulevard multi-use path or cycle track/separated bicycle lane to access a signalized intersection to cross the arterial road. Given the desire for a mixed-use, dense urban environment, there also may be reason to consider some form of active transportation-specific crossings of arterial and collector roads.

While this study focuses on the Britannia Secondary Plan Area, arrows are shown at the end of active transportation facilities, recognizing that these are intended to continue and connect to the greater Milton community. Active transportation facilities are planned to be constructed along Regional arterials and all Town arterial and collector roads. The facilities will extend into the Boyne Secondary Plan Area and other parts of Milton.

End of trip facilities such as bike parking will be important to encourage people to travel by active modes. Covered, secure bike parking is recommended at major trip generators such as schools, parks, and retail areas.

Figure 5.13: Proposed Active Transportation Network



Note: Fifth Line is assumed to be a minor arterial road for the proposed AT network.

5.5 Transit

Milton Transit provides local transit within the Town and acts as an essential link to the existing Milton GO train station. Currently, Milton Transit does not service the BSPA due to the very low level of development within the area. However, considering the population-employment forecast and future developments planned for the area, it is expected that Milton Transit will expand service to the BSPA. Transit service likely will operate on arterial roads such as Britannia Road and James Snow Parkway to connect the BSPA to other parts of Milton. Transit also would service some of the collector roads (primarily major collectors), to provide connections to areas outside the BSPA but also circulation with the Secondary Plan Area. Transit service is also expected to be coordinated with operations at the Milton GO station (as well as the potential future Trafalgar GO station, when it is constructed and operational) to facilitate movement to and from these stations to the BSPA.

The 2024 – 2029 Milton Transit Service Review and Master Plan Update identifies transit network recommendations for urban expansion areas such as Britannia, including a potential transit terminal at the intersection of James Snow Parkway and Britannia Road. Conceptual higher order transit routes are proposed along Birtannia Road, Trafalgar Road, and parts of James Snow Parkway to meet long-term demand and provide inter-regional connectivity. A mix of services (trunk routes and inter-regional services, local/feeder routes and On-Demand services) will be designed to meet demand, attract ridership to increase transit mode share, and provide coverage. The updated Plan also recommends that routes serving urban expansion areas, including Britannia, are planned for potential connections into terminals in Mississauga and Oakville.

Intra/inter-regional transit provided by others such as GO Transit, could utilize future Transit Priority Corridor infrastructure, for example, potential future HOV lanes on Britannia Road and James Snow Parkway to connect within the BSPA and also to Oakville, Mississauga, and other destinations.

Future planning studies within the BSPA should address the needs of the higher-order transit system and plan for transfer stations, parking structures (if appropriate), and first and last mile connectivity through infrastructure such as the active transportation network within the BSPA. The Town should also consider ways to future-proof transit plans to consider emerging transit technologies including electric bus charging infrastructure.

5.6 Goods Movement

Goods movement is an integral part of an economy. The Regional road nature of Britannia Road and James Snow Parkway make these roadways important goods movement routes. The TMP recognizes that this goods movement function will remain as the BSPA develops and recommends implementing policies to support goods movement. The freight policy should address the following:

- Truck movement should be allowed on all arterial roads.
- Truck movement should be allowed in commercial and employment areas.
- Restrictions to large trucks may be implemented within the BSPA, pedestrian-friendly neighbourhoods and inside residential communities.

- Conflicts between truck routes and transit or cycling routes should be avoided or mitigated.
- Except for local deliveries, truck movement should be prohibited in Town collector and local roads.

5.7 Road Safety

To enhance road safety and work towards reducing the number of fatalities and serious injuries on the transportation network, the Town of Milton can develop a safety strategy for the BSPA (or as part of a Town-wide strategy). The strategy should view road safety as a shared responsibility between road users and system designers from transportation planners, traffic engineers, land-use planners, to policymakers, law enforcement, and emergency response teams. Rather than demanding road users to adapt perfectly to their surroundings, the strategy should focus on designing a road system that accounts for human error.

The safety strategy should be contextual and flexible and include the following key components:

- Clear and specific short-, medium-, and long-term goals and targets related to fatalities and injuries to ensure accountability and transparency.
- A monitoring and evaluation framework that allows for ongoing updates to the strategy as conditions evolve.
- A road safety management (RSM) or systemic road safety process (SRS) that leverages the Town's safety performance functions and collision data to identify collision trends and countermeasures.
  - The RSM or SRS should focus on system-level collision cause trends to inform preventative measures.
  - For high-collision road segments and intersections identified, network screening programs should be developed to reduce collisions by improving road design and incorporating countermeasures for safer roads.
- Evidence-based guidelines for the preferred countermeasures, community initiatives, pilot studies, and education programs developed through the RSM or SRS.
  - Road-safety audits and assessments should be considered as a part of new or rehabilitation transportation projects to optimize road-safety features. Audit criteria should be created to ensure road-safety countermeasures are included in future transportation-related projects including transportation system concept plans, neighbourhood renewal, and development plans.
  - Proven road-safety countermeasures such as improved right-turn designs and increased use of prohibited and protected left-turn signals should be considered in a context-sensitive manner.
  - The use of vehicle-mounted, temporary, and permanent digital speed feedback equipment should be expanded to help with speed management and reducing shortcutting through neighbourhoods.
  - Safe speed limits should be set to increase safety for vulnerable road users especially around school zones to reduce collision speeds and frequency.
- A public involvement initiative that incorporates road safety into the Town's public consultation on transportation-related projects to enhance community engagement and generate public support for the program.

- A biennial traffic safety culture survey to measure improvement and gauge the public's opinion towards different components of the safety strategy. Based on the response, new education programs should be developed and enhanced.
- A School Safety Committee to focus specifically on increasing safety measures around schools such as the establishment of school zone speed limits, crossing guard programs, and safer school pick-up and drop-off areas.

The success of the safety strategy relies on the public, internal and external road safety stakeholders, and most importantly system designers' shared commitment to road safety.

- **Recommendation:** Establish a Town-wide road safety strategy. (Note: the Town is expected to undertake a road safety strategy in 2025)

5.8 Transportation Demand Management

Transportation Demand Management (TDM) is an overarching philosophy that incorporates several policies, programs, services, and products that encourage people to choose more sustainable travel methods. The objectives for TDM measures are to lower transportation's environmental footprint, decrease health-related issues, distribute transportation modes more evenly, and help alleviate traffic congestion. Incorporating TDM measures as part of transportation planning helps to ensure transportation infrastructure is utilized efficiently and effectively. TDM measures focus on methods to move people by means other than the single-occupant vehicle by encouraging walking, cycling, riding transit, carpooling, and providing incentives, resulting in the creation of a cohesive transportation network.

A comprehensive TDM plan specific for the BSPA should be developed that incorporates the Town's and the Region's TDM plans. Milton's TMP includes the framework to provide guidance in managing any existing and new programs. The components within the framework include:

- Identification of needs and existing programs and services.
- Identification of goals and the tools, programs and measures needed to meet these goals.
- Evaluation of tools and measures to determine the ones most appropriate for the BSPA, for individual sites and uses, and for the residents of Milton.
- Development of a tool kit.
- Development of an implementation plan:
  - Costing.
  - Phasing.
  - Staffing.
  - Integration of programs and measures to achieve goals.
  - Identification of partnerships.
  - Monitoring program to evaluate success.
- Links with development approvals process and overall land-use planning to create TDM-oriented communities.

Currently, both the Town of Milton and Halton Region are working together on a number of programs, including workplace travel programs for daily work commuters and school-based programs for school travel plans. Milton is also working to reduce utilitarian trips for individuals through education, incentives, and promotions.

Linking TDM with the development approvals process will support effective implementation of TDM measures. The process should encourage developers to provide secure long-term and short-term visitors bicycle parking. New developments should be required to have shower facilities, priority carpool parking and TDM programs to discourage dependency on cars.

The TDM plan for the BSPA should also consider approaches such as:

- Partnering with existing transportation management associations such as Smart Commute to encourage carpooling and shared rides.
- Providing discounted transit passes to enhance transit ridership.
- Encouraging businesses to implement telecommuting and flexible work arrangements to reduce the need for daily commuting.
- Providing public education through potential public engagement opportunities to increase community awareness of alternative transportation modes and their various benefits, such as health, financial savings, and addressing environmental issues.
- Increasing connectivity to existing and future transit and active transportation facilities as a requirement within the site planning approval process.
- Allowing for unbundled parking and exploring paid parking.
- Creating mixed-use developments and facilitating active uses at grade along street frontages.
- Providing enhanced bus shelters.

There needs to be a dedicated TDM “champion” in order to have a tangible impact in the modal split of trips in the Britannia area. Staffing is essential so that the plans, policies, and programs have a person or team to implement them, monitor them, and make adjustments as necessary to adapt to changing travel behaviours.

- **Recommendation:** Establish a Britannia-specific TDM plan and dedicate staff to implement, monitor and update the plan.

6 Implementation Plan

6.1 Phasing

The BSPA will be developed in two phases by creating focused neighbourhood areas in the study area for each of the phases. The phasing and the neighbourhood developments are determined based on how the Town of Milton would be able to extend its water and sewer services to the new settlements.

Figure 6.1 shows the phasing of the development along with the neighbourhood boundaries. As shown in the figure, the first phase of the development occurs east of Fourth Line, followed by development west of Fourth Line in the second phase.

- **Recommendation:** Establish a development hierarchy system starting from the neighbourhood node areas before developing residential areas moving from east to west.

6.2 Agency Coordination

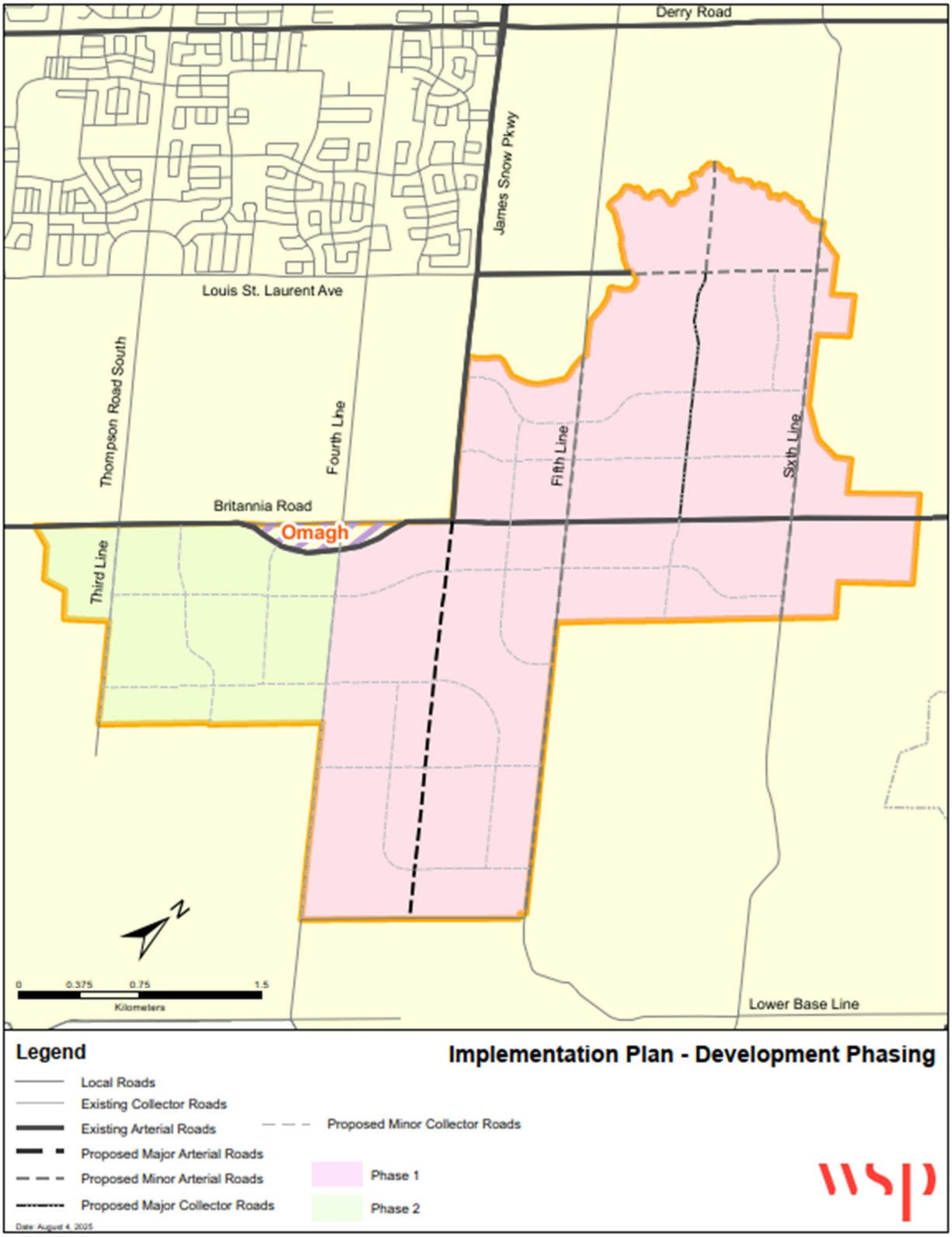
To best support the goals of the BSPA and enhance overall regional connectivity, it is important that the Town continues to collaborate with stakeholders within the area. Town officials should continue to work with Metrolinx and neighbouring municipalities such as Oakville and Mississauga to continue advocating for transit projects to further connections to and from the BSPA.

Neighbouring municipal transit authorities are great resources and partners to work with to provide regional connectivity to transit users. The Town should work to invite and coordinate any transit service expansions from Mississauga Transit (MiWay) and Oakville Transit in the future to leverage all transit investments and ensure continuity of the transportation network in the BSPA.

Town staff have been active members of the Municipal Advisory Group as a part of the 2011 Halton Region TMP. The Town should continue to encourage such effort from its staff, closely monitor any future policy changes across all levels of government, and actively work with the Region in realizing their shared vision for the Britannia Road and James Snow Parkway Corridor as transit priority corridors.

- **Recommendation:** Collaborate with other transportation agencies and municipal transit authorities to provide regional connectivity.

Figure 6.1: Implementation Plan – Development Phasing



6.3 Monitoring Development

To ensure the success of the transportation network in the BSPA, the Town should track progress via performance indicators. This approach will allow the Town to monitor the travel behaviour and performance of the transportation network by confirming the validity of the transportation projects and identifying any future needs for modifications or updates to transportation infrastructure.

6.3.1 Progress toward Performance Goals

To achieve the transportation vision set forth by the Secondary Plan, key performance indicators, including measures, data required, and frequency of monitoring are outlined below in **Table 6.1**.

Table 6.1: Performance Indicators and Measures

Indicator	Measure	Data Source	Frequency
Road Network Congestion	Volume to capacity ratios on north-south and east-west screen lines during the p.m. peak period	Regional and Town automated traffic counts	Every three years
	Average Annual Daily Traffic volumes	Halton Region traffic counting program	Every three years
Transit	Modal share of transit trips during the p.m. peak period	Transportation Tomorrow Survey (TTS)	Every five years
	Transit ridership	Metrolinx ridership data; Milton Transit ridership data	Yearly
Active Transportation (AT)	Modal share of walking and cycling trips during the p.m. peak period	Transportation Tomorrow Survey (TTS)	Every five years
	Total kilometres of on/off-road cycling facilities (such as bike lanes, cycle tracks, off-road trails, and paved shoulders) and new sidewalks	Town of Milton	Every three years
Carpooling	Modal share of auto passengers during the p.m. peak period	Transportation Tomorrow Survey (TTS)	Every five years

Indicator	Measure	Data Source	Frequency
Goods Movement	Percentage of heavy vehicles on Regional roads	Halton Region traffic counting program	Every three years

As for any monitoring program, the collection and analysis of relevant data is at the core of measuring the multi-modal transportation network's performance. For the Greater Toronto Area, the Transportation Tomorrow Survey (TTS) is the most comprehensive travel survey available and is currently used widely in the industry. The survey typically is conducted every five years. The most recent survey was conducted in 2022, and data are expected to be released in 2024.

Besides the TTS data, the Town should consider utilizing the Automatic Traffic Recording (ATR) counts regularly conducted by Halton Region to further monitor vehicular traffic along Regional roads within Milton. For Town roads that are not accounted for by the Regional count, the Town could establish its own regular traffic counting program to help monitor road network congestion. However, the Town should take into consideration that a certain level of roadway congestion should be tolerated and expected in key locations during peak hours, as one of the TMP's goals is to ensure multi-modal mobility by managing vehicular volumes, and not overbuild roads at the expense of other funding priorities.

For transit performances, Milton Transit regularly collects transit ridership data and reports on its financial performance to Council on an annual basis. This data should be reviewed to observe any trends in increasing ridership, while taking into consideration Milton's growing population and employment forecast.

The Town has an impressive track record of requiring active transportation facilities, both within the road right-of-way as well as off-road trails, as prerequisites to new development. The Town should monitor the impact of investments in active transportation through both the TTS data and consider initiating its own traffic information collection program. Such programs would help to address the lag in reporting time with the TTS data and provide more data for walking, cycling, or carpooling within Milton. Data from the survey and cycling counts on select routes could be used to build a database of AT data to help quantify usage of facilities, and to gauge the change in the public's attitude towards AT. Potential methods for the Town to initiate such a program could be through the Town's own resources or through enlisting the support of active transportation advocacy groups and the general public.

Timing

As shown in **Table 6.2**, different monitoring frequencies are recommended for projects under each implementation window. The closer the expected project implementation deadline, the more frequent the recommended routine monitoring. To further improve the program's reliability and convenience, the Town is encouraged to set-up an e-mail notification system to routinely alert the applicable personnel to update the project monitoring plan.

Table 6.2 Project Monitoring Frequency

Project Implementation Date	Frequency of Monitoring
Within the next two years	Quarterly
Greater than two years but less than five years	Bi-annually
Five years or greater	Annually

Staffing

To ensure the timely implementation of the recommended projects, the Town should assign an implementation coordinator to oversee the routine completion of implementation progress reports and liaise with the assigned project managers to understand project status.

- **Recommendation:** Set up a monitoring system which includes a benchmark for Milton to establish a specific goal to reach for the BSPA using the performance indicators and measures.

6.4 Costing and Funding

6.4.1 Costing

A high-level cost estimation for the transportation network within the BSPA was developed**.** The total cost of the transportation network is estimated to be approximately $182.45 million for both phases of the BSPA and includes proposed collector roads, potential road and trail crossings of a waterbody, the off-road trail/multi-use path network, and the proposed expansion of the municipal transit service. Details on what is included or excluded in the cost estimate are described below.

Roads

The James Snow Parkway extension, Louis St. Laurent Avenue extension and the New North Regional Road are already identified in existing plans and are therefore not included in the cost estimates. The ongoing widening and realignment of Britannia Road and the widening of James Snow Parkway are also not included in the cost estimates. As the Town has begun work on Fifth Line (Derry to Britannia), Sixth Line (Highway 401 to Britannia), and Louis St. Laurent Avenue (Fifth Line to Trafalgar), these segments have not been included in the cost estimates. The remainder of the roads in the BSPA are all 2-lane collector roadways that will be constructed along with the developments of the study area.

Halton Region is currently undertaking an Environmental Assessment for the New North Regional Road, which will determine whether the Region is building a Regional road along that corridor. The Britannia Secondary Plan makes provisions for a road along this corridor should the Region not proceed with a Regional road. The Secondary Plan identifies this road as a collector road between Britannia Road and the extension of Louis St. Laurent and as a minor arterial road north of the Louis St. Laurent extension to the northern limit of the Secondary Plan. Per the Town's Local Service Policy, a collector road would be direct developer responsibility.

The Town would be responsible for any minor arterial portions of the road. Due to the uncertainty of this road, costs have been included to account for the construction of this road, should the Region not proceed with a Regional road. The total length of the arterial portion of this roadway north of Louis St. Laurent Avenue to the study area boundary is estimated as 0.7 km, which will cost about$10.9 million including the cost of the structure. The collector portion of this roadway between Louis St. Laurent Avenue and Britannia Road is estimated as 1.55 km, which will cost about $13.95 million to construct.

There is a total of approximately 17.5 km of new collector roadways in Phase 1 and about 6.2 km of new collector roadways in Phase 2 of the development. The total approximate cost for the construction of these new collector roadways is $91.3 million and the cost breakdown by phase is shown in

Table 6.3.

Costs estimates are based on recent tenders for road projects within the Town of Milton as well as developer cost estimates. Costs represent expenses related to road works within the right-of-way, including excavation and preparation, construction, construction management, storm servicing, traffic signals, lighting, landscaping, and active transportation facilities. Land and property acquisition costs are excluded, as are any site/project-specific requirements. Town staff project management of construction is also excluded. Costs will require confirmation as the projects approach their implementation dates as well as to address any site/project-specific requirements.

Per the Town's Local Service Policy, the collector road network in the Britannia Secondary Plan Area is the direct developer responsibility.

Road Crossings

There are a total of 14 potential road crossings over a waterbody, typically a stream or a creek, within the BSPA. All of the crossings are along proposed 2-lane collector roads, with 10 road crossings identified as potential crossings in Phase 1 of the development and 4 road crossings identified in Phase 2 of the development. At a road crossing, the roadway lane width is assumed to be 3.5 m per lane, and the active transportation facility width is assumed to be 3.0 m with a 0.5 m buffer width. The total crossing width used to estimate the cost of a 2-lane road is 14 m. All road crossings are assumed to be 20 metres long. According to MTO's Parametric Estimating Guide, $5,000 is suggested as the average cost per square metre for a new precast box culvert. The total approximate cost for the construction of road crossings is $33.6 million and the cost breakdown by phase for road crossings is presented in

Table 6.3.

Road Intersection Improvements

In the future total conditions analysis, turn lane intersection improvements at Britannia Road and Thompson Road and Britannia Road and Fifth Line are required to improve intersection operations to an acceptable LOS. These include:

- An additional northbound left and right turn lane at the Britannia Road and Thompson Road intersection.
- An additional northbound through lane and right turn lane at the Britannia Road and Fifth Line intersection.

A cost of $175,000 was assumed for each turn lane, consistent with the estimates used in the 2025 Milton Transportation Master Plan. Based on this assumption, and recognizing that the estimate excludes design, permits, site-specific costs, and contingency, the estimated cost of intersection improvements is $700,000.

Trails/MUPs

The trail network proposed within the Secondary Plan Areas is approximately 9.8 km in length in Phase 1 and 2.7 km in Phase 2. To comply with AODA requirements, a hard-faced surface multi-use trail is recommended. The trails are further classified into lit and unlit asphalt corridors. The trails that are in-situ watercourse corridors and are not planned to be changed or engineered are assumed to be lit corridors, while the rest of the trails are assumed to be unlit. The estimated unit costs are for a 3.0 m asphalt multi-use trail (lit or unlit) outside of the road right-of-way and are obtained from the Town's DC Background study. The total approximate cost for the construction of trail facilities is $11.75 million and the cost breakdown by phase for trail facilities is presented in

Table 6.3.

Trail/MUP Crossings

At a trail crossing over a waterbody (creeks and streams), a light-duty pedestrian boardwalk is assumed to be sufficient. A typical crossing is assumed to be 20 m long and 3 m wide with railings. With an estimated one trail crossing in Phase 2 in the BSPA, the total approximate cost for the construction of trail crossing is $286,000 as per the Town's DC Background Study.

Transit

In the BSPA, new transit routes are expected to be introduced, generally travelling East-West on Louis St. Laurent Avenue, Derry Road, and Britannia Road, as well as North-South on James Snow Parkway. There could also be circulating feeder buses within the area that connect to the main routes on the arterial roads.

To achieve the aspirational 20 percent transit mode share goal set out in the Region's 2011 TMP, a total of 32 new buses are proposed to be added to the network, including a redundancy of five extra buses. The transit cost estimate only includes the cost of the vehicle itself and does not include transit facility costs, operation service expenditures, and other capital expenditures. It is to be noted that the unit cost of $1.06 million per bus used here for cost estimates assumed costs for a conventional 12M diesel bus. However, the Town plans to use electric buses starting in 2030, for which the costs will be significantly higher. The total approximate cost for transit buses (assuming diesel bus) is $33.9 million and the cost breakdown by phase for transit buses is presented in

Table 6.3.The 20 percent transit mode share is recognized to be aspirational and the number of buses needed to meet future demand likely will be refined using updated data from Halton Region's Integrated Master Plan.

The costs shown in

Table 6.3 also exclude design/permit (15%) costs and contingency (20%) costs and are based on the unit cost estimation used in the ongoing Milton Transportation Master Plan. The Milton TMP costs were originally developed based recent tenders for projects within the Town of Milton as well as developer cost estimates.

Table 6.3: Summary of Cost Estimates (2024 Dollars)

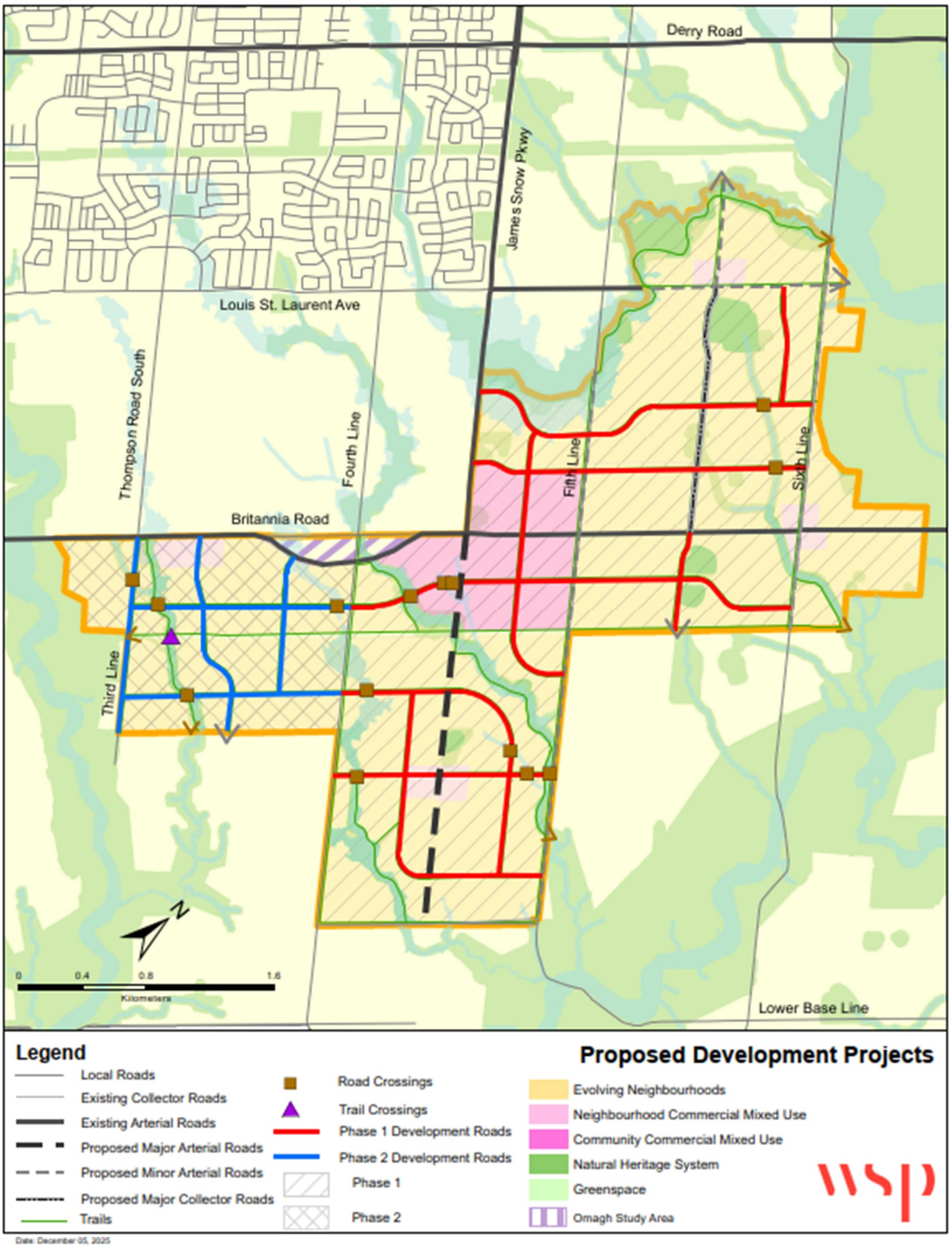
Facility	Total Cost per Unit	Cost Unit	Phase 1 Length / Units	Total Cost	Phase 2 Length / Units	Total Cost
Minor Arterial- 4 lanes (including bridge structure) *	-	-	0.7	**$10,900,000**	0	**$0**
Major Collector - 4 lanes	$9,000,000	per centre line km	1.55	**$13,950,000**	0	**$0**
Collector Road - 2 lanes	$3,500,000	per centre line km	15.9	**$55,650,000**	6.2	**$21,700,000**
Road Crossing - 2 lanes	$2,400,000	each	10	**$24,000,000**	4	**$9,600,000**
Intersection Improvement	$175,000	each	4	**$700,000**	0	**$0**
Trail (lit)	$1,026,000	per linear km	8.06	**$8,269,560**	1.36	**$1,395,360**
Trail (unlit)	$667,000	per linear km	1.76	**$1,173,920**	1.36	**$907,120**
Trail Crossing	$286,000	each	0	**$0**	1	**$286,000**
Transit Bus	$1,060,000	per vehicle	21	**$22,260,000**	11	**$11,660,000**
			Total	**$136,903,480**	**Total**	**$45,548,480**

* The cost of the 4-lanes minor arterial road for the New North Regional Road between Louis St. Laurent Avenue and the study area boundary is provided by Town's DC study team. The cost includes capital surcharge, PMR, design/CA etc.

Figure 6.2 shows the proposed transportation network development projects that are included in the cost estimates shown in

Table 6.3.

Figure 6.2: Proposed Development Projects



6.4.2 How will the Transportation Network be Funded?

The BSPA is largely greenfield development and the roads, active transportation facilities within the road right-of-way, and off-road trail networks are expected to be constructed by the private development community as part of the development approvals process. It is to be noted that, the private developers typically build portions of the off-road trail network during site grading or alterations, with costs largely reimbursed through Development Charges (DCs). The Town generally funds trails in areas like NHS, river setbacks, and utility corridors, where developers may only provide basic preparation such as pre-grading.The private developers would also construct the local road network once it is defined at a later stage in the development process.

Existing Town roads, such as the extension of Louis St. Laurent Avenue, could be constructed through a variety of funding approaches, including developer-driven, or using funds being collected through development charges. Regional roads would be expected to be funded through funds collected through development charges and other funding sources, as necessary.

Transit Funding

In order to expand and improve Milton's current transit system to generate higher transit use and meet future transit demand, the Town should be prepared to explore beyond existing funding sources. Potential sources of additional capital and operating funding for new transit services include:

Federal, Provincial and Regional Governments

As transit demand grows and becomes a more significant policy issue in Canada, an increasing number of federal, provincial (including Metrolinx), and Halton Region funding sources may become available or expand under existing or future grant programs. As Milton expands its transit services, the Town should monitor for opportunities of recurring or one-time grants for transit services from the regional, provincial, and federal governments (such as the Public Transit Infrastructure Fund program recently utilized by the Town, or the upcoming Canada Public Transit Fund).

Currently, eligible municipal transit programs are supported by the Province of Ontario through the provincial gas tax program, with funding based on a combination of population and transit ridership. Should Milton's transit system grow under the secondary plan as recommended, an increase in funding could be materialized to help support new services.

Transit Users and Advertisers

To generate additional fare revenue, the Town can examine ways to increase fares and encourage ridership. As the costs of providing public transit are shared between users and public subsidies provided by the local, provincial, federal, and (in some jurisdictions) regional governments, the Town should regularly review its transit fare policies to ensure that fare revenues meet the Town's cost recovery goals and remain consistent with the fare policies of other similar Canadian transit providers.

The Town can also examine the possibility of a new fare vending and collection equipment to offer a wider variety of fare products to match the specific needs of various riders. Presto implementation has been identified in the Milton Transit Five-Year Service Plan and Master Plan Update.

Furthermore, the Town should continue to look for ways to partner with the private sector to either generate revenue through advertising within the transit system, or reduce cost through strategic cross-promotional campaigns.

7 Conclusion

The vision of the TMP is to provide a continuous network of multi-modal transportation connections to the Town and Region's transportation system, ensuring that it is accessible for all modes and users. The proposed transportation network created to meet this vision was developed based on Milton's Official Plan, Milton's TMP, and other supporting documents (such as regional planning documents) and further determined based on input from the public, stakeholders, and Town staff.

This TMP report addresses the key principles for the BSPA through the following recommendations:

- **Design a complete street network that would be supportive of all modes of travel:** by creating a connected trail and active transportation network within the Natural Heritage System and along arterial and collector roads that connects the employment and residential areas.
- **Provide viable transportation options and choices:** by establishing an active transportation, trail, and road network to support walking, cycling, transit, driving and goods movement.
- **Connect the rest of Milton and enable regional connectivity:** by developing a north-south transit-oriented corridor along James Snow Parkway to connect to Milton's GO train station, as well as an east-west transit-oriented corridor on Britannia Road to connect to Trafalgar Road (Trafalgar Road is proposed to be a transit-oriented corridor that connects to a new GO train station in the Trafalgar Corridor Secondary Plan).
- **Create a foundation for balanced investment in transportation**: by integrating various modes of travel in the proposed infrastructure to shift from an auto-centric to a more balanced modal split.

Existing Conditions

Under existing conditions, most of the analyzed intersections operate at v/c ratios lower than 0.85 during both peak hours. The following intersections operate with v/c ratios over 0.85 during both peak hours under existing conditions:

- Britannia Road and Trafalgar Road.
- Trafalgar Road and Derry Road.
- Trafalgar Road and Lower Base Line.

The 95th percentile queue lengths were within the available storage lengths for all the movements at the study intersections except at the northbound left turn movement at the Trafalgar Road and Derry Road intersection.

Future Background Conditions

Under future background conditions in 2051, before the addition of the Britannia Secondary Plan development traffic, nine of the ten analyzed intersections are expected to operate at or above a v/c ratio of 0.85 during both the a.m. and p.m. peak hour, even after assuming dual left turn lanes at major intersections (assumed lane configurations are shown in **Figure 5.2**). The only intersection that is not projected to exceed an overall v/c ratio of 0.85 is at Britannia Road and Thompson Road.

To account for work from home trips and a potential increase in transit and active transportation trips, a sensitivity analysis was conducted that assumed 15% lower car volumes. This analysis shows vastly improved conditions compared to the regular future background conditions analysis, with six of the ten examined intersections operating at an overall v/c larger than 0.85 (and only one operating with an overall v/c larger than 1). This highlights the need to maintain / incent work from home policies and promote the use of sustainable transportation modes across Milton, to reduce overall car volumes.

Future Total Conditions

Under future total conditions in 2051, with the addition of the Britannia Secondary Plan development traffic, none of the analyzed intersections operate below an overall v/c ratio of 0.85. Mitigation measures on top of optimizing signal timing plans for splits and cycle lengths have been proposed and the recommended mitigation measures include:

- An additional northbound left and right turn lane at the Britannia Road and Thompson Road intersection.
- An additional northbound through lane and right turn lane at the Britannia Road and Fifth Line intersection. The Town has completed an Environmental Assessment and is undertaking design for this intersection.

Dual left turn lanes on the other intersections are already required in the total background conditions.

A similar sensitivity analysis was conducted as for the future background conditions, assuming that all background traffic was reduced by 15%. This again improves performance at all intersections, though many remain above capacity. This re-confirms the need for Town-wide initiatives that foster work from home and the use of sustainable modes to reduce overall background volumes across Milton. Infrastructure improvements to intersections will not be sufficient to solve challenges in both the future background and future total scenarios.

Additional recommendations are presented in **Section 8.0**.

8 Recommendations

Recommendations for the BSPA include:

- Undertake Town-wide efforts to reduce overall vehicle volumes in Milton by investing in active transportation and transit, and creating effective TDM policies that would incent work from home, transit, active transportation, and carpooling. The Town may also wish to consider land use changes that would bring job locations closer to homes, to reduce the number and length of car trips and thereby reduce pressures on the examined intersections. These improvements will be required as intersection infrastructure improvements alone were found to not be sufficient to improve intersection performance beyond the Region's critical thresholds.
- Ensure transit and active transportation facilities, and appropriate transportation demand management measures, are in place in line with the rate of development to foster sustainable transportation choices.
- Protect right-of-way requirements for the proposed dual left-turn lanes now and monitor the intersections regularly to determine if the additional lanes are necessary.
- Conduct Tertiary Plan Transportation Studies to refine the level of analysis and reassess the recommendations to confirm if additional transportation infrastructure is required to support the development in the area. These studies should:

1. **Collect new traffic count data and reconfirm existing conditions**: Traffic patterns have "normalized" since the pandemic and new traffic count data should be collected and analyzed for study area intersections.
2. **Use Halton Region ABM to determine future background traffic**: Similar to the Britannia TMP, the Region's ABM should be used to extract future background traffic volumes on road links in the study area.
3. **Report the land uses**: The Britannia TMP used the Secondary Plan land uses to generate trips. The Tertiary Plan RNA should determine if there are any refinements or updates to the land uses and report the land uses being considered in the Tertiary Plan.
4. **Divide the Regional EMME Model Traffic Analysis Zones**: create sub zones that can reflect a more detailed trip generation and assignment method.
5. **Confirm the modal split for Britannia trips**: The modal split used in the Britannia TMP is an aspirational 33% for the ultimate build out of the full Secondary Plan Area, assumed to be in the year 2051. This aspirational goal incorporates expected future advances in transit, introduction of intra/inter-regional transit, expansion of Milton Transit, continued adoption of work from home several days a week, and other travel demand management measures.

   The RNA should identify and propose all reasonable measures that may be implemented in order to support a shift towards the modal split used in the Britannia TMP. This could include:
   - **Active transportation**: Wider sidewalks, wider cycling facilities, additional connections for active transportation; active transportation supports such as requirements for secure bike parking, locker room and shower facilities at businesses, and other items.

- **Transit**: Additional buses to accommodate shorter headways and provide capacity for additional riders; transit priority measures such as queue jump lanes, dedicated transit lanes; additional facilities to service and store the additional buses; introduction of intra/inter-regional bus service; expansion of existing bus services; introduction of higher order transit such as Light Rail Transit (LRT); and any other measures.
- **Road classifications**: Changes to road classification to accommodate more space for sustainable travel; modifications to existing road classifications to accommodate more space for more sustainable travel.
- **Travel demand management**: Any other measures.

The expected modal split that can be reasonably assumed for Britannia trips in the Tertiary Plan RNA must be documented and justified. The modal split for Britannia-generated trips should be confirmed with the Region and Town prior to further analysis.

6. **Present the distribution of trips**: The distribution of Britannia trips should be documented with a rationale given for how it was determined.
7. **Assign trips to the network**: Document the assignment of vehicle trips to the road network.
8. **Conduct the intersection analysis**: Analyze future conditions and provide conclusions and recommendations in the RNA report.
9. **Establish a coordinated Staging and Monitoring Plan**: Ensure that Regional roads, including James Snow Parkway and Britannia Road, function efficiently as major routes through the Secondary Plan area (results will need to conform to criteria established in the Region's Transportation Impact Study Guidelines) based on Planning horizons.
10. **As part of the Staging and Monitoring Plan, develop an Access Management Strategy**: Ensure interim and ultimate access during implementation is achieved through landowner coordination and in conformity with the Region's Access Management Guideline and By-law 32-17 and Secondary Plan.
11. **Determine lane configurations at intersections**: at Town minor arterial and collector road intersections and Town minor arterial and collector road intersections with Regional roads, recommend interim and ultimate intersection configurations (before and after Town and Regional road capital improvements), as part of the Staging and Monitoring Plan.

As an outcome of the analysis, the Town requires that the Tertiary Plan RNA report:

- **Road classification and right-of-way**: The road classification, based on the classification presented in the Town's TMP, needs to be reconfirmed for all Town roads. The right-of-way, also based on the Town's TMP, needs to be stated for all Town roads. This is expected to be the ultimate right-of-way needed at full build out of the Britannia Secondary Plan Area.
    a. Indicate if road classifications need to be changed to accommodate more space for more sustainable modes of travel. Indicate if travel lanes need to be repurposed from general purpose lanes to other types of lanes or facilities for other sustainable travel modes.

- **Intersection controls and lane configurations**: The type of intersection control (stop, roundabout, signals, and so forth) needs to be confirmed and the lane configurations need to be documented. The lane configurations need to be able to fit within the right-of-way for the confirmed road classification.
- **Transit infrastructure to meet modal split**: The number of additional buses or other infrastructure needed to be able to accommodate passengers using transit.
    a. Indicate how public transit can be made more affordable and more convenient than the private automobile for travel for Britannia-related trips. Indicate what infrastructure and other measures are required to be able to achieve the mode split used for Britannia-related trips, from additional buses to the introduction of higher order transit, dedicated transit lanes, and any other infrastructure and measures.
- **Transportation infrastructure requirements for walking, cycling, and vehicular travel:** Based on the road classification, the walking (sidewalks, multi-use paths), cycling (dedicated cycling facilities, multi-use paths), and vehicle requirements (number of lanes) need to be stated.
    a. Indicate any enhancements to the walking and cycling network that are required to achieve the mode split used for Britannia-related trips. Indicate if any other travel demand measures are needed to achieve the mode split for Britannia-related trips.

- Establish a Town-wide road safety strategy that works towards reducing the number of fatalities and serious injuries in the transportation network.
- Establish a Britannia-specific TDM plan and dedicate staff to implement, monitor and update the plan.
- Establish a development hierarchy system starting from the neighbourhood node areas before developing residential areas moving from east to west.
- Collaborate with other transportation agencies and municipal transit authorities to provide regional connectivity.
- Set up a monitoring system which includes a benchmark for Milton in order to establish specific goals to reach for the BSPA using performance indicators and measures.
- Institute a parking system that will further promote transit ridership and carpooling and create a safe environment for active transportation through limited on-street parking and paid parking at transit stations.

APPENDIX

A EXISTING TRAFFIC DATA

APPENDIX

A-1 TURNING MOVEMENT COUNTS

Britannia Rd @ Regional Rd 25

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:30:00
To: 8:30:00

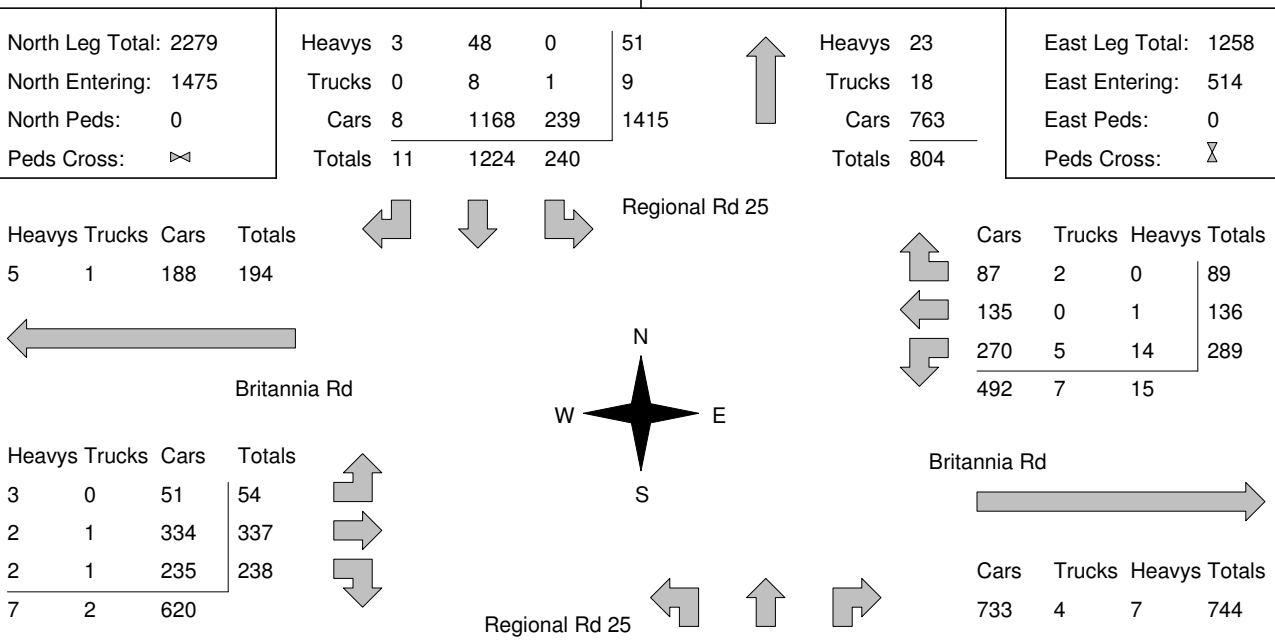
Municipality: Halton Region
Site #: 0000003408
Intersection: Regional Rd 25 & Britannia Rd
TFR File #: 17
Count date: 9-Dec-2019

Weather conditions:
Overcast/Wet

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Regional Rd 25 runs N/S



Comments

Britannia Rd @ Regional Rd 25

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

One Hour Peak
From: 11:45:00
To: 12:45:00

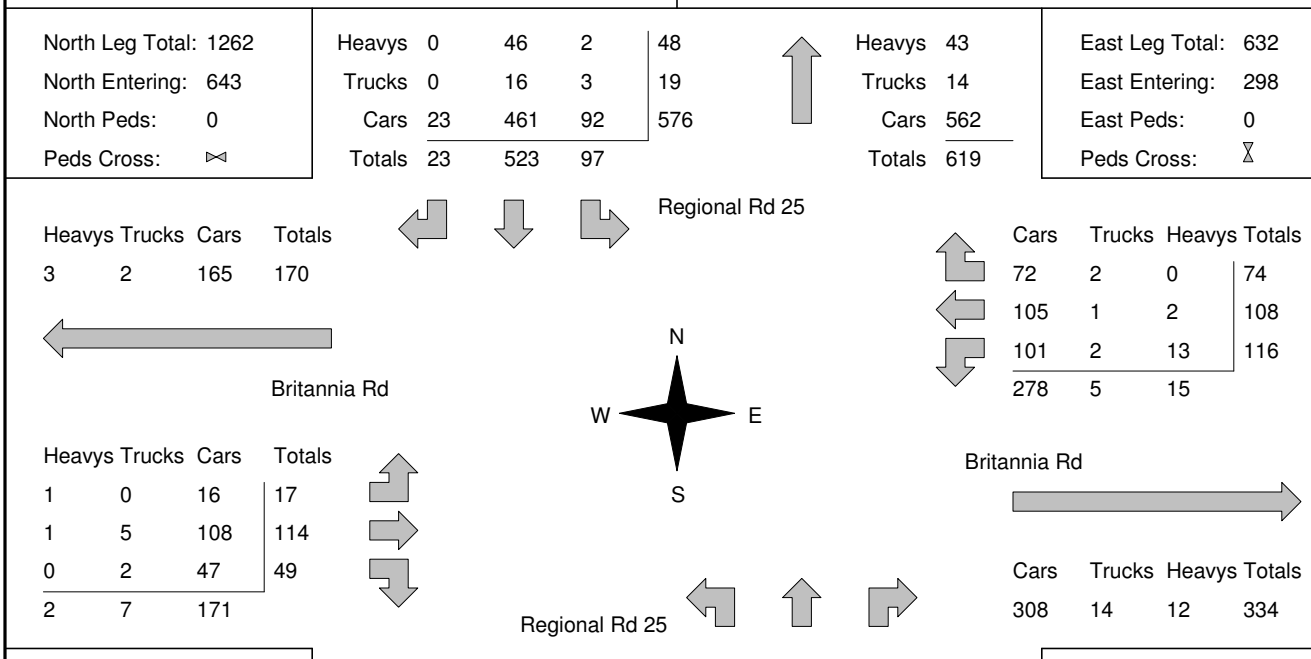
Municipality: Halton Region
Site #: 0000003408
Intersection: Regional Rd 25 & Britannia Rd
TFR File #: 17
Count date: 9-Dec-2019

Weather conditions:
Overcast/Wet

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Regional Rd 25 runs N/S



Comments

Britannia Rd @ Regional Rd 25

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:45:00
To: 17:45:00

Municipality: Halton Region
Site #: 0000003408
Intersection: Regional Rd 25 & Britannia Rd
TFR File #: 17
Count date: 9-Dec-2019

Weather conditions:
Overcast/Wet

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Regional Rd 25 runs N/S

North Leg Total:	2040			
North Entering:	698			
North Peds:	0			
Peds Cross:	⋈			
Heavys	0	12	0	12
Trucks	0	8	1	9
Cars	42	542	93	677
Totals	42	562	94	
Heavys	27			
Trucks	5			
Cars	1310			
Totals	1342			
East Leg Total:	1403			
East Entering:	857			
East Peds:	0			
Peds Cross:	⧖			

Regional Rd 25

Heavys	Trucks	Cars	Totals
2	1	643	646

	Cars	Trucks	Heavys	Totals
	249	1	1	251
	394	1	1	396
	206	2	2	210
	849	4	4	

Britannia Rd

N
W E
S

Heavys	Trucks	Cars	Totals
2	0	30	32
0	0	138	138
0	0	35	35
2	0	203	

Britannia Rd

Cars	Trucks	Heavys	Totals
538	3	5	546

Regional Rd 25

Peds Cross:	⧖			
West Peds:	0			
West Entering:	205			
West Leg Total:	851			
Cars	783			
Trucks	10			
Heavys	14			
Totals	807			
Cars	207	1031	307	1545
Trucks	0	4	2	6
Heavys	1	24	5	30
Totals	208	1059	314	
Peds Cross:	⋈			
South Peds:	0			
South Entering:	1581			
South Leg Total:	2388			

Comments

Britannia Rd @ Regional Rd 25

Total Count Diagram

Municipality: Halton Region
Site #: 0000003408
Intersection: Regional Rd 25 & Britannia Rd
TFR File #: 17
Count date: 9-Dec-2019

Weather conditions:
Overcast/Wet

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Regional Rd 25 runs N/S

North Leg Total:	13423			
North Entering:	6673			
North Peds:	0			
Peds Cross:	⋈			
Heavys	3	299	11	313
Trucks	3	90	11	104
Cars	164	5092	1000	6256
Totals	170	5481	1022	
Heavys	285			
Trucks	94			
Cars	6371			
Totals	6750			
East Leg Total:	8171			
East Entering:	4231			
East Peds:	0			
Peds Cross:	⧖			

Regional Rd 25

Heavys	Trucks	Cars	Totals
31	21	2406	2458

Cars	Trucks	Heavys	Totals
1059	13	9	1081
1600	11	17	1628
1435	19	68	1522
4094	43	94	

Britannia Rd

N
W E
S

Heavys	Trucks	Cars	Totals
18	2	216	236
9	13	1423	1445
9	9	677	695
36	24	2316	

Britannia Rd

Cars	Trucks	Heavys	Totals
3813	46	81	3940

Regional Rd 25

Peds Cross:	⧖			
West Peds:	0			
West Entering:	2376			
West Leg Total:	4834			
Cars	7204			
Trucks	118			
Heavys	376			
Totals	7698			
Cars	642	5096	1390	7128
Trucks	7	79	22	108
Heavys	11	258	61	330
Totals	660	5433	1473	
Peds Cross:	⋈			
South Peds:	0			
South Entering:	7566			
South Leg Total:	15264			

Comments

Britannia Rd @ Thompson Rd S

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:00:00
To: 8:00:00

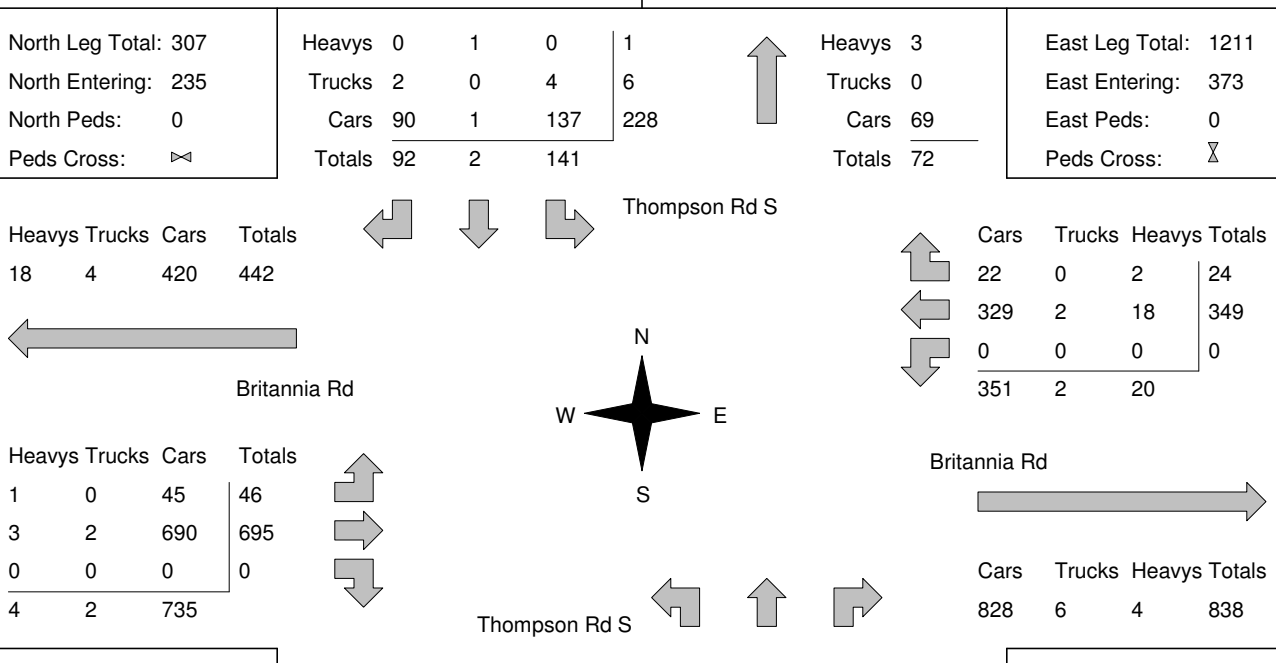
Municipality: Halton Region
Site #: 0000003244
Intersection: Britannia Rd & Thompson Rd S
TFR File #: 1
Count date: 7-Nov-2019

Weather conditions:
Overcast/Wet

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Britannia Rd runs W/E



Comments

Britannia Rd @ Thompson Rd S

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

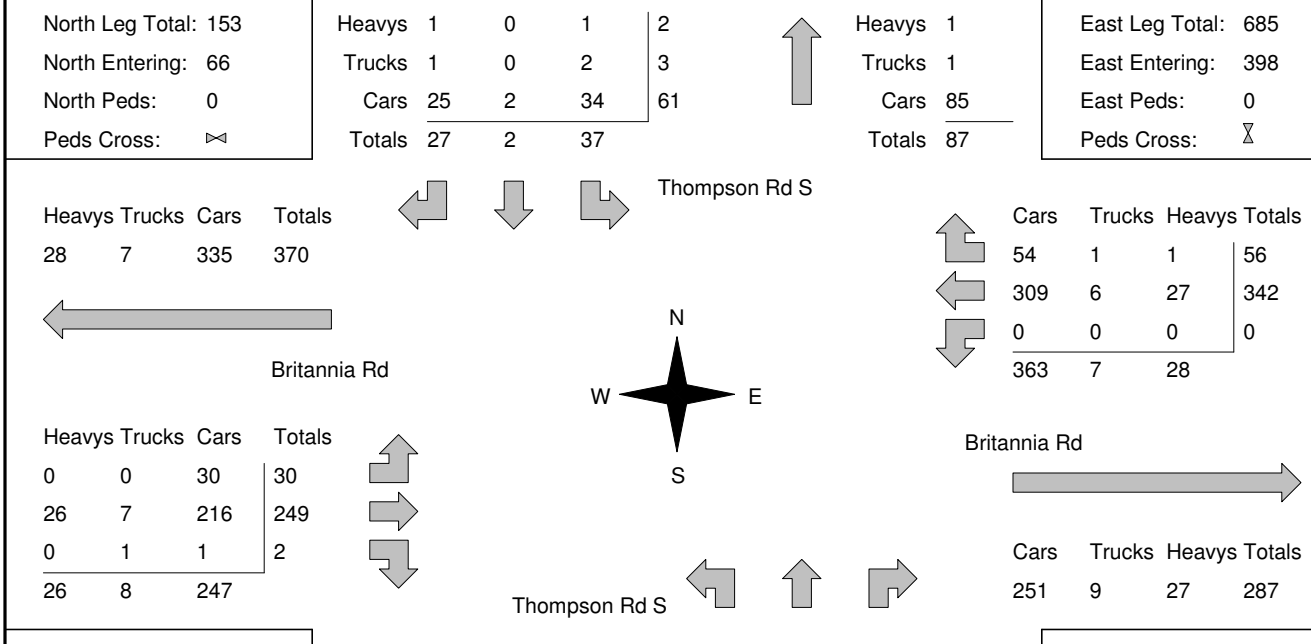
Municipality: Halton Region
Site #: 0000003244
Intersection: Britannia Rd & Thompson Rd S
TFR File #: 1
Count date: 7-Nov-2019

Weather conditions:
Overcast/Wet

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Britannia Rd runs W/E



Comments

Britannia Rd @ Thompson Rd S

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:30:00
To: 17:30:00

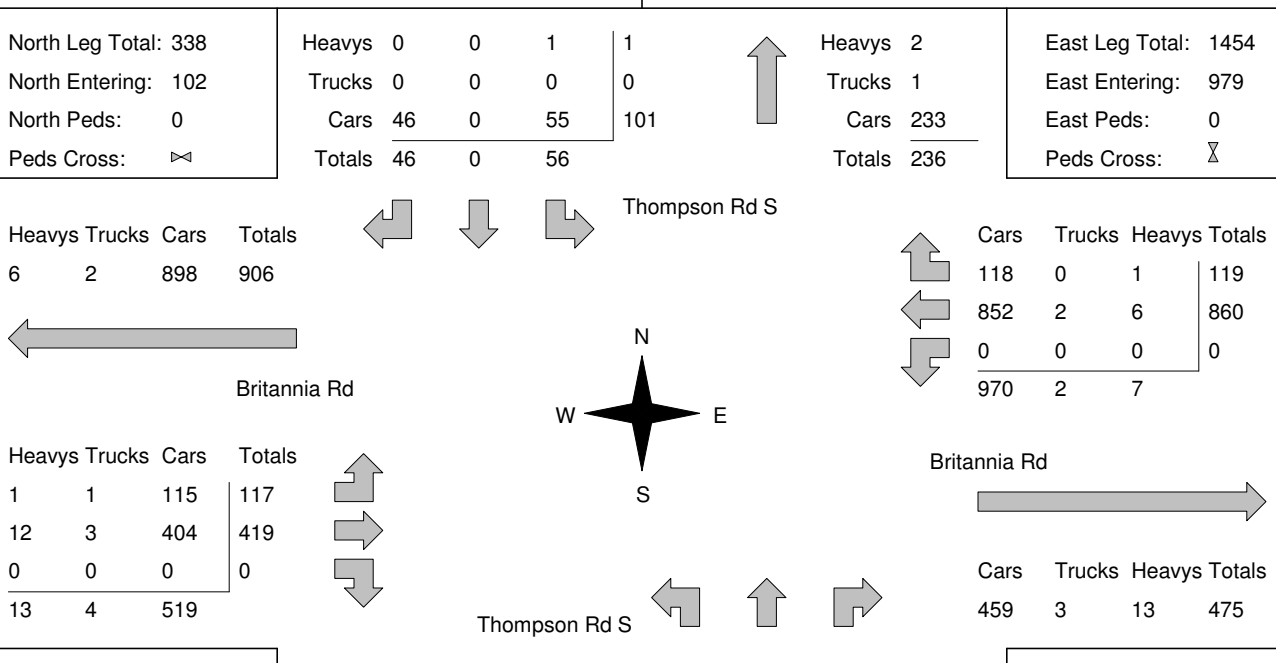
Municipality: Halton Region
Site #: 0000003244
Intersection: Britannia Rd & Thompson Rd S
TFR File #: 1
Count date: 7-Nov-2019

Weather conditions:
Overcast/Wet

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Britannia Rd runs W/E



Comments

Britannia Rd @ Thompson Rd S

Total Count Diagram

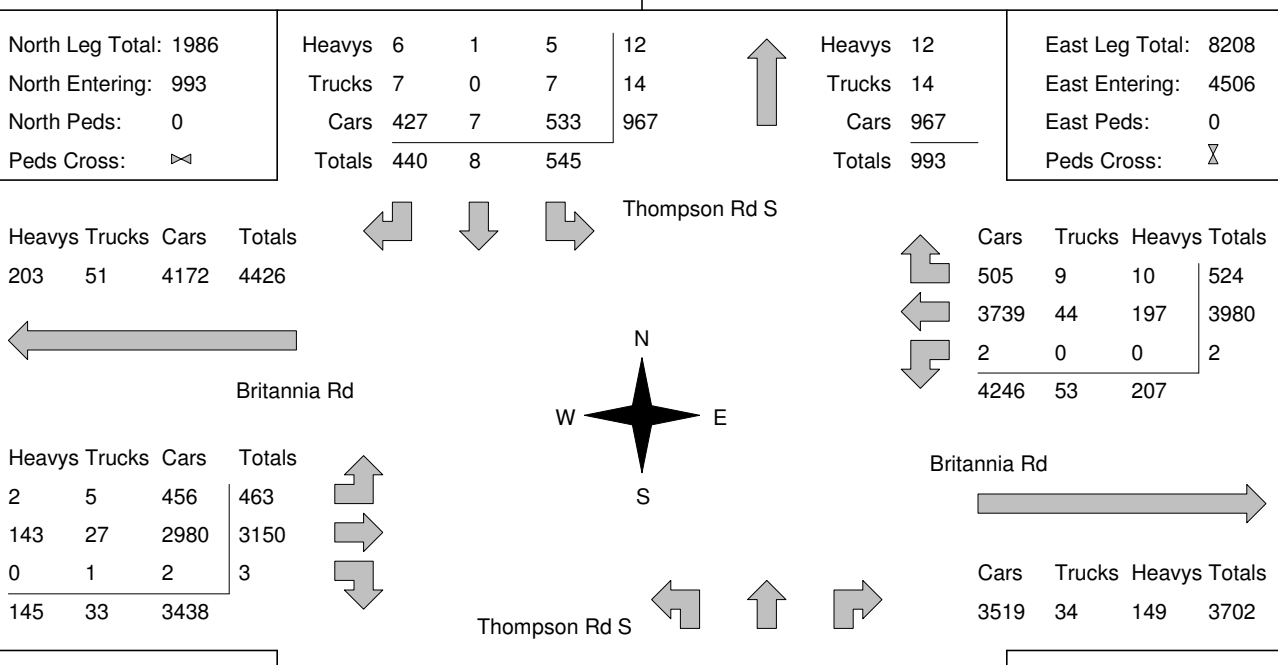
Municipality: Halton Region
Site #: 0000003244
Intersection: Britannia Rd & Thompson Rd S
TFR File #: 1
Count date: 7-Nov-2019

Weather conditions:
Overcast/Wet

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Britannia Rd runs W/E



Comments

Britannia Rd @ Fourth Line

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:15:00
To: 8:15:00

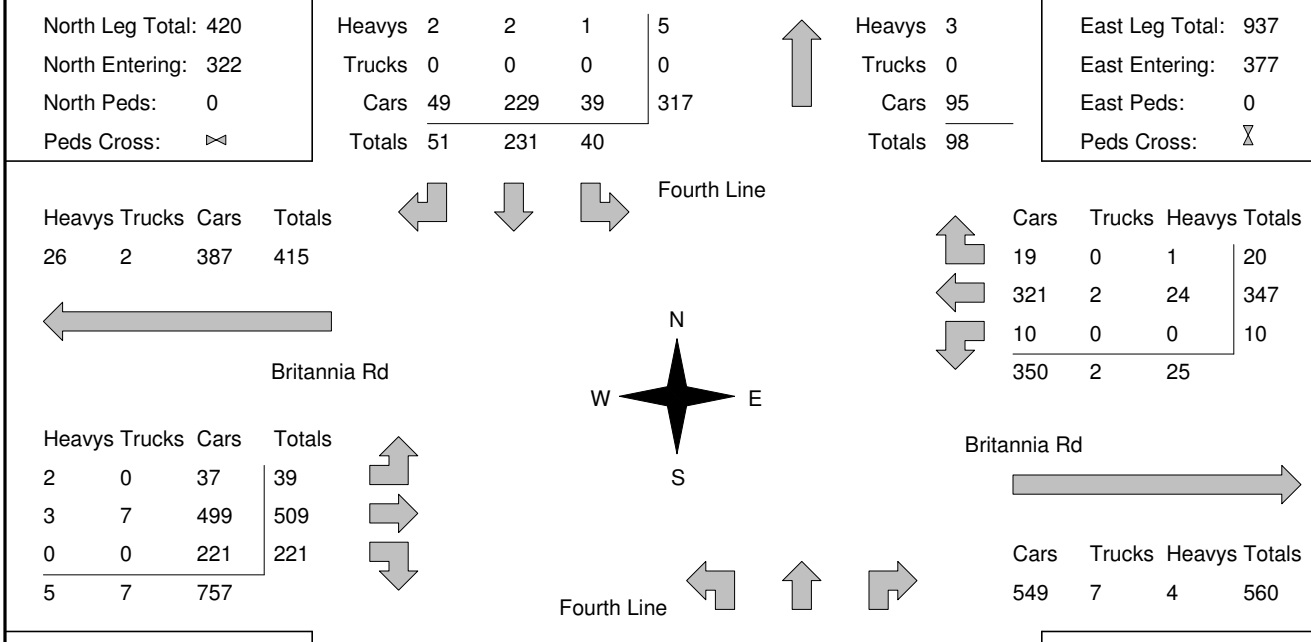
Municipality: Halton Region
Site #: 0000003245
Intersection: Britannia Rd & Fourth Line
TFR File #: 2
Count date: 7-Nov-2019

Weather conditions:
Overcast/Wet

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Britannia Rd runs W/E



Comments

Britannia Rd @ Fourth Line

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

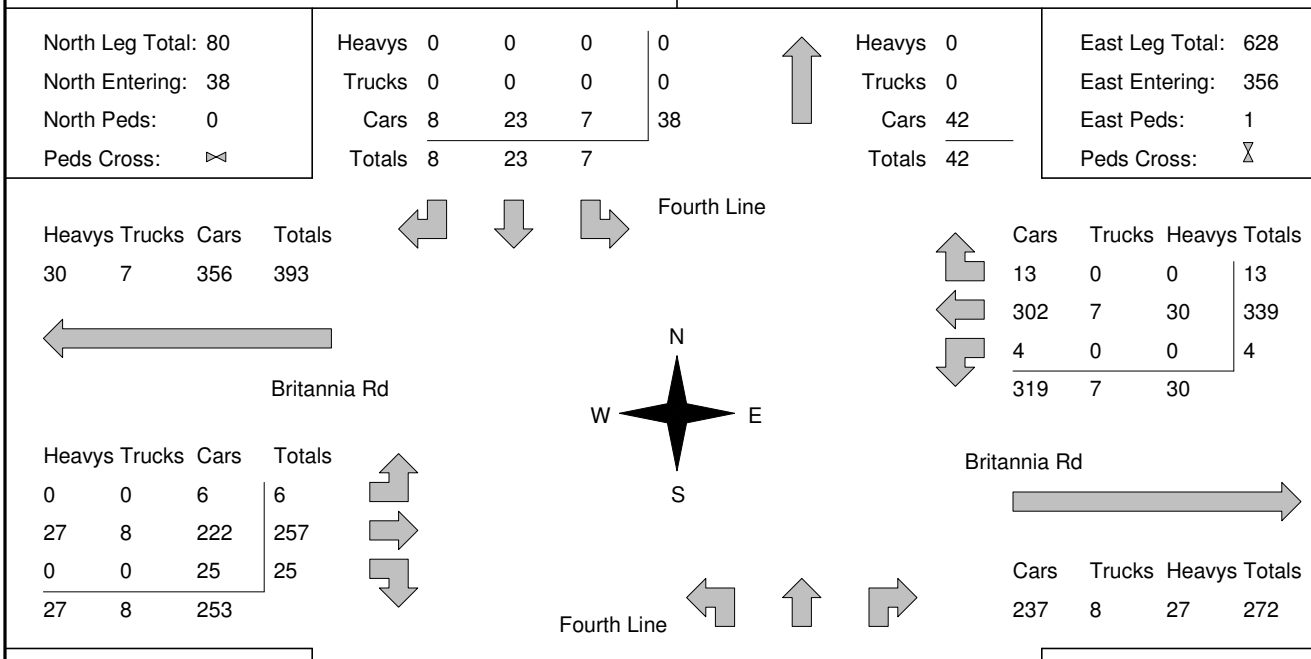
Municipality: Halton Region
Site #: 0000003245
Intersection: Britannia Rd & Fourth Line
TFR File #: 2
Count date: 7-Nov-2019

Weather conditions:
Overcast/Wet

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Britannia Rd runs W/E



Comments

Britannia Rd @ Fourth Line

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:45:00
To: 17:45:00

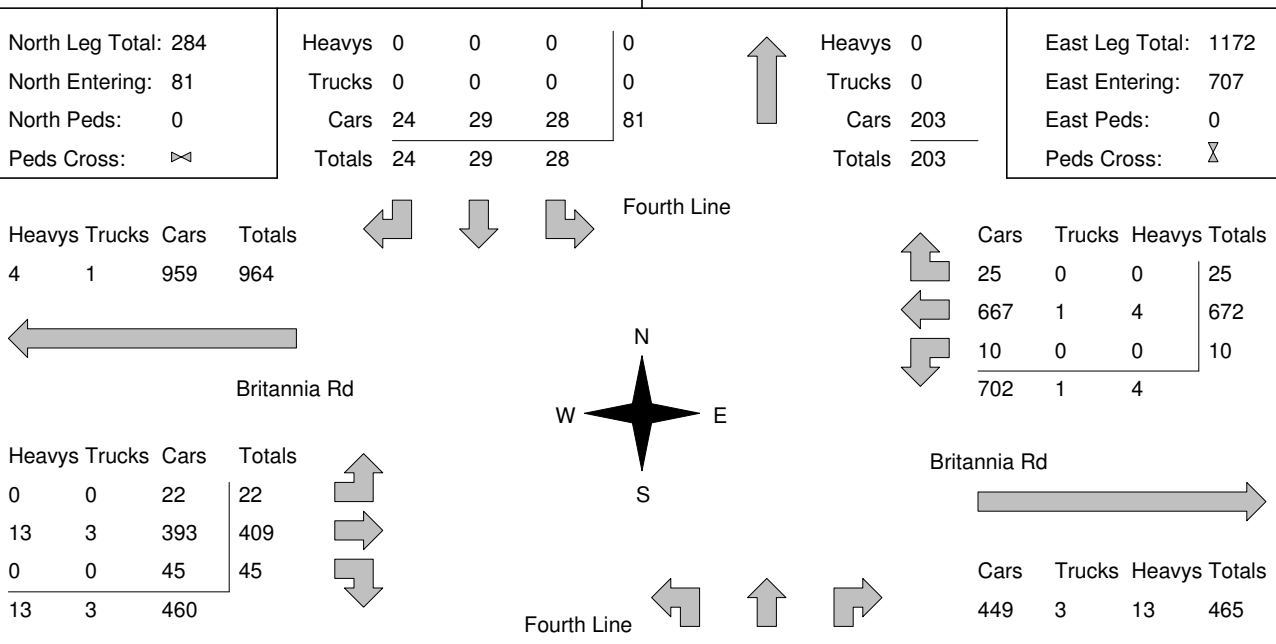
Municipality: Halton Region
Site #: 0000003245
Intersection: Britannia Rd & Fourth Line
TFR File #: 2
Count date: 7-Nov-2019

Weather conditions:
Overcast/Wet

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Britannia Rd runs W/E



Comments

Britannia Rd @ Fourth Line

Total Count Diagram

Municipality: Halton Region
Site #: 0000003245
Intersection: Britannia Rd & Fourth Line
TFR File #: 2
Count date: 7-Nov-2019

Weather conditions:
Overcast/Wet

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Britannia Rd runs W/E

North Leg Total:	1629			
North Entering:	884			
North Peds:	0			
Peds Cross:	⋈			
Heavys	5	3	2	10
Trucks	4	1	1	6
Cars	178	535	155	868
Totals	187	539	158	
Heavys	9			
Trucks	2			
Cars	734			
Totals	745			
East Leg Total:	6965			
East Entering:	3696			
East Peds:	1			
Peds Cross:	⧖			

Fourth Line

Heavys	Trucks	Cars	Totals
202	52	4209	4463

Cars	Trucks	Heavys	Totals
120	0	6	126
3257	48	197	3502
66	1	1	68
3443	49	204	

Britannia Rd

N
W E
S

Heavys	Trucks	Cars	Totals
3	1	128	132
145	39	2816	3000
1	1	587	589
149	41	3531	

Britannia Rd

Cars	Trucks	Heavys	Totals
3080	42	147	3269

Fourth Line

Peds Cross:	⧖			
West Peds:	0			
West Entering:	3721			
West Leg Total:	8184			
Cars	1188			
Trucks	3			
Heavys	5			
Totals	1196			
Cars	774	486	109	1369
Trucks	0	1	2	3
Heavys	0	0	0	0
Totals	774	487	111	
Peds Cross:	⋈			
South Peds:	0			
South Entering:	1372			
South Leg Total:	2568			

Comments

Britannia Rd @ James Snow Pkwy

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:15:00
To: 8:15:00

Municipality: Halton Region
Site #: 0000003246
Intersection: Britannia Rd & James Snow Pkwy
TFR File #: 3
Count date: 7-Nov-2019

Weather conditions:
Overcast/Wet

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Britannia Rd runs W/E

North Leg Total: 801
North Entering: 648
North Peds: 0
Peds Cross: ⋈

Heavys	3	9	12
Trucks	1	0	1
Cars	78	557	635
Totals	82	566	

Heavys	7
Trucks	1
Cars	145
Totals	153

East Leg Total: 1421
East Entering: 387
East Peds: 0
Peds Cross: ⧖

James Snow Pkwy

Heavys	Trucks	Cars	Totals
25	2	351	378

Britannia Rd

Heavys	Trucks	Cars	Totals
1	0	61	62
1	7	460	468
2	7	521	

N
W E
S

Cars	Trucks	Heavys	Totals
84	1	6	91
273	1	22	296
357	2	28	

Britannia Rd

Cars	Trucks	Heavys	Totals
1017	7	10	1034

Peds Cross: ⧖
West Peds: 0
West Entering: 530
West Leg Total: 908

Comments

Britannia Rd @ James Snow Pkwy

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: Halton Region
Site #: 0000003246
Intersection: Britannia Rd & James Snow Pkwy
TFR File #: 3
Count date: 7-Nov-2019

Weather conditions:
Overcast/Wet

Person(s) who counted:
Cam

**** Signalized Intersection ****

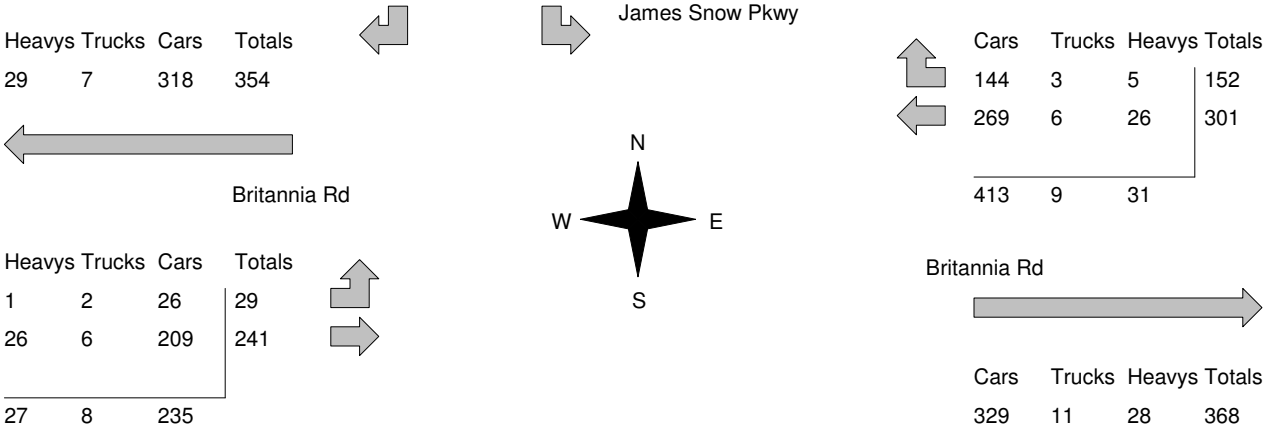
Major Road: Britannia Rd runs W/E

North Leg Total: 361
North Entering: 180
North Peds: 0
Peds Cross: ⋈

Heavys	3	2	5
Trucks	1	5	6
Cars	49	120	169
Totals	53	127	

Heavys	6
Trucks	5
Cars	170
Totals	181

East Leg Total: 821
East Entering: 453
East Peds: 0
Peds Cross: ⧖



Peds Cross: ⧖
West Peds: 0
West Entering: 270
West Leg Total: 624

Comments

Britannia Rd @ James Snow Pkwy

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 17:00:00
To: 18:00:00

Municipality: Halton Region
Site #: 0000003246
Intersection: Britannia Rd & James Snow Pkwy
TFR File #: 3
Count date: 7-Nov-2019

Weather conditions:
Overcast/Wet

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Britannia Rd runs W/E

North Leg Total: 906
North Entering: 224
North Peds: 0
Peds Cross: ⋈

Heavys	1	1	2
Trucks	1	1	2
Cars	65	155	220
Totals	67	157	

Heavys	5
Trucks	1
Cars	676
Totals	682

East Leg Total: 1784
East Entering: 1241
East Peds: 0
Peds Cross: ⧖

James Snow Pkwy

Heavys	Trucks	Cars	Totals
5	3	703	711

Britannia Rd

Heavys	Trucks	Cars	Totals
3	0	82	85
11	1	374	386
14	1	456	

Cars	Trucks	Heavys	Totals
594	1	2	597
638	2	4	644
1232	3	6	

Britannia Rd

Cars	Trucks	Heavys	Totals
529	2	12	543

N
W E
S

Peds Cross: ⧖
West Peds: 0
West Entering: 471
West Leg Total: 1182

Comments

Britannia Rd @ James Snow Pkwy

Total Count Diagram

Municipality: Halton Region
Site #: 0000003246
Intersection: Britannia Rd & James Snow Pkwy
TFR File #: 3
Count date: 7-Nov-2019

Weather conditions:
Overcast/Wet

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Britannia Rd runs W/E

North Leg Total:	4900
North Entering:	2407
North Peds:	0
Peds Cross:	⋈

Heavys	26	41	67
Trucks	11	15	26
Cars	429	1885	2314
Totals	466	1941	

Heavys	46
Trucks	17
Cars	2430
Totals	2493

East Leg Total:	10165
East Entering:	5341
East Peds:	0
Peds Cross:	⧖

James Snow Pkwy

Heavys	Trucks	Cars	Totals
204	50	3447	3701

Britannia Rd

Heavys	Trucks	Cars	Totals
15	3	369	387
138	35	2710	2883
153	38	3079	

Cars	Trucks	Heavys	Totals
2061	14	31	2106
3018	39	178	3235
5079	53	209	

Britannia Rd

Cars	Trucks	Heavys	Totals
4595	50	179	4824

N
W E
S

Peds Cross:	⧖
West Peds:	0
West Entering:	3270
West Leg Total:	6971

Comments

Britannia Rd @ Fifth Line

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:45:00
To: 8:45:00

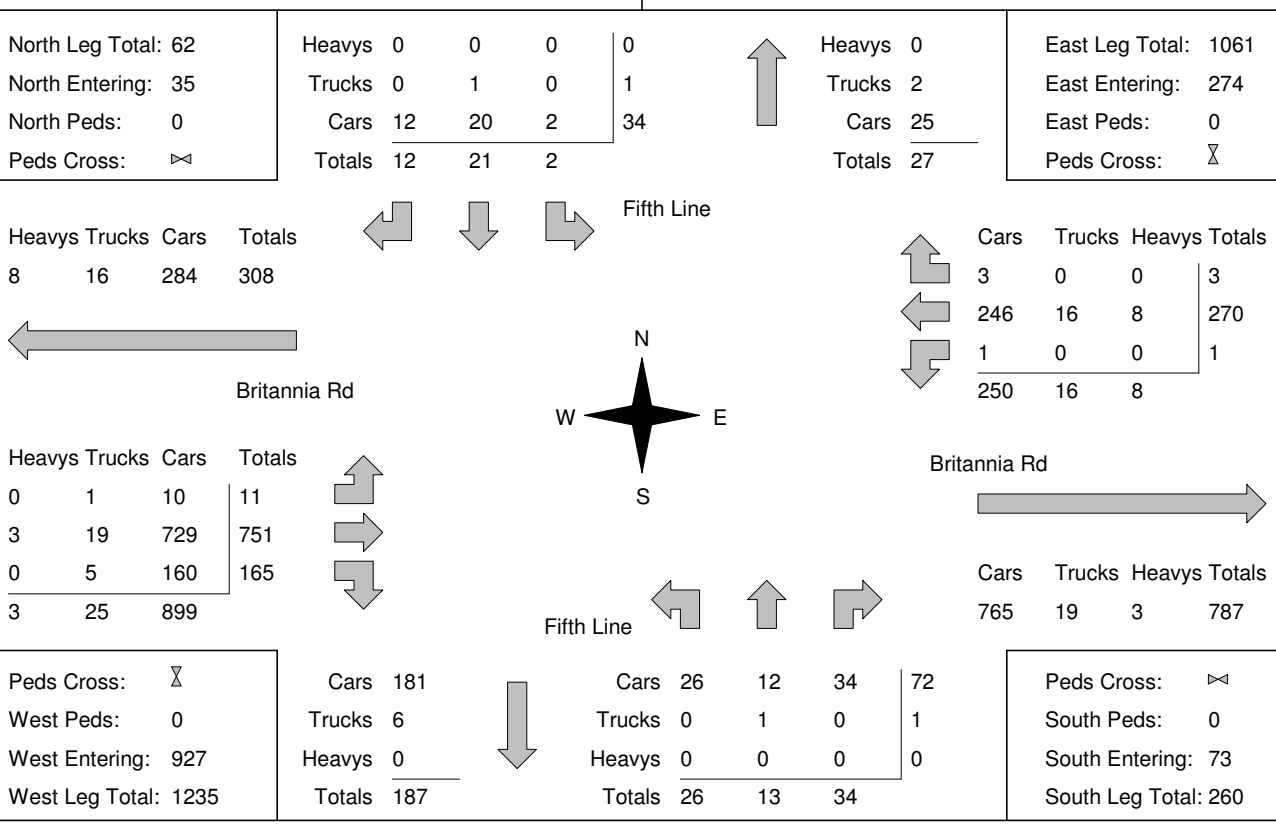
Municipality: Halton Region
Site #: 1001900100
Intersection: Britannia Rd & Fifth Line
TFR File #: 3
Count date: 3-May-2018

Weather conditions:
Rain

Person(s) who counted:
Rick W

**** Signalized Intersection ****

Major Road: Britannia Rd runs W/E



Comments

Britannia Rd @ Fifth Line

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

One Hour Peak
From: 11:00:00
To: 12:00:00

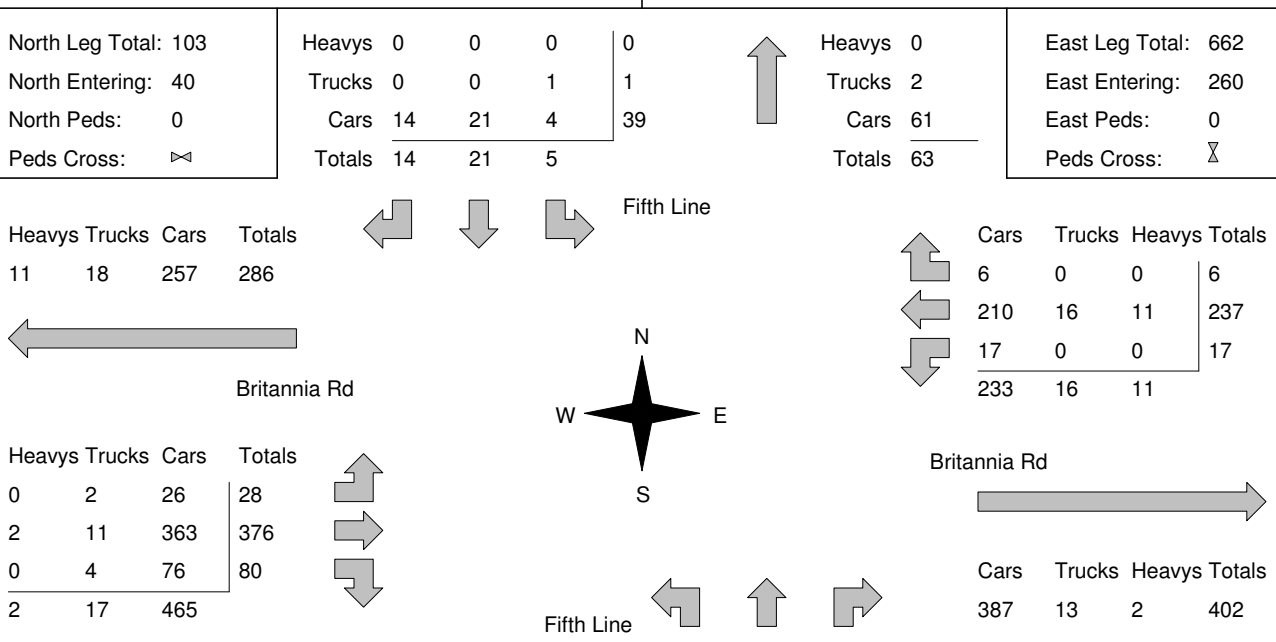
Municipality: Halton Region
Site #: 1001900100
Intersection: Britannia Rd & Fifth Line
TFR File #: 3
Count date: 3-May-2018

Weather conditions:
Rain

Person(s) who counted:
Rick W

**** Signalized Intersection ****

Major Road: Britannia Rd runs W/E



Comments

Britannia Rd @ Fifth Line

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:45:00
To: 17:45:00

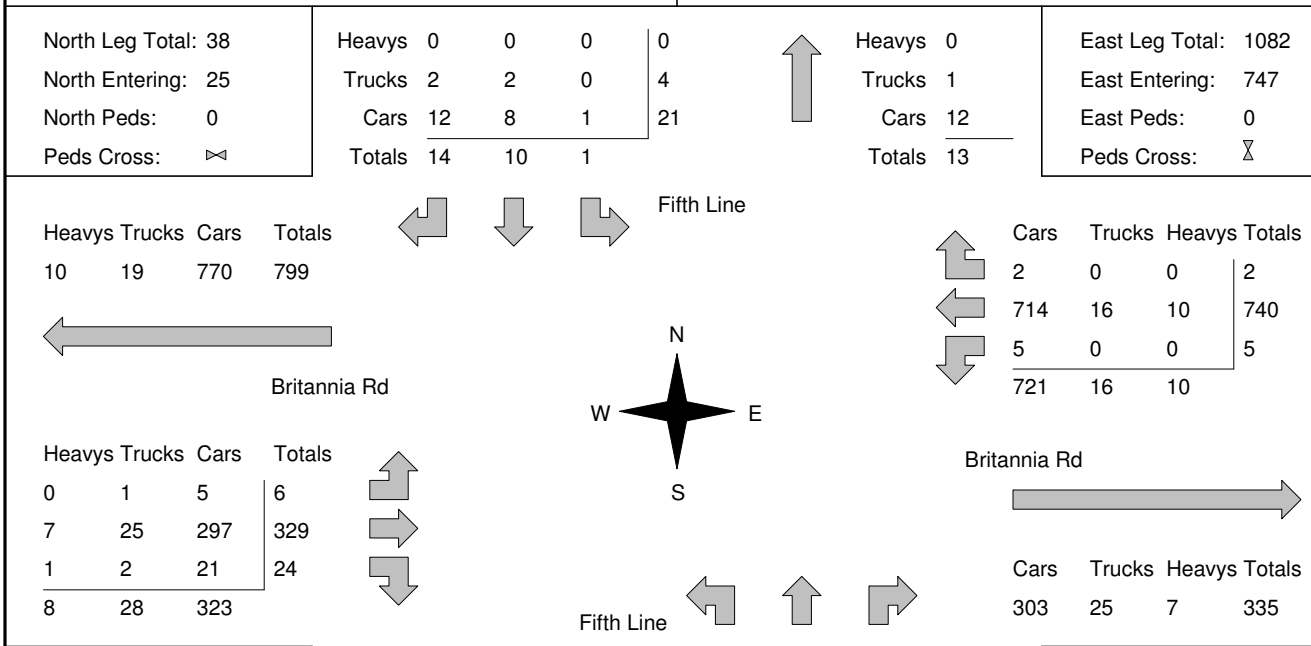
Municipality: Halton Region
Site #: 1001900100
Intersection: Britannia Rd & Fifth Line
TFR File #: 3
Count date: 3-May-2018

Weather conditions:
Rain

Person(s) who counted:
Rick W

**** Signalized Intersection ****

Major Road: Britannia Rd runs W/E



Comments

Britannia Rd @ Fifth Line

Total Count Diagram

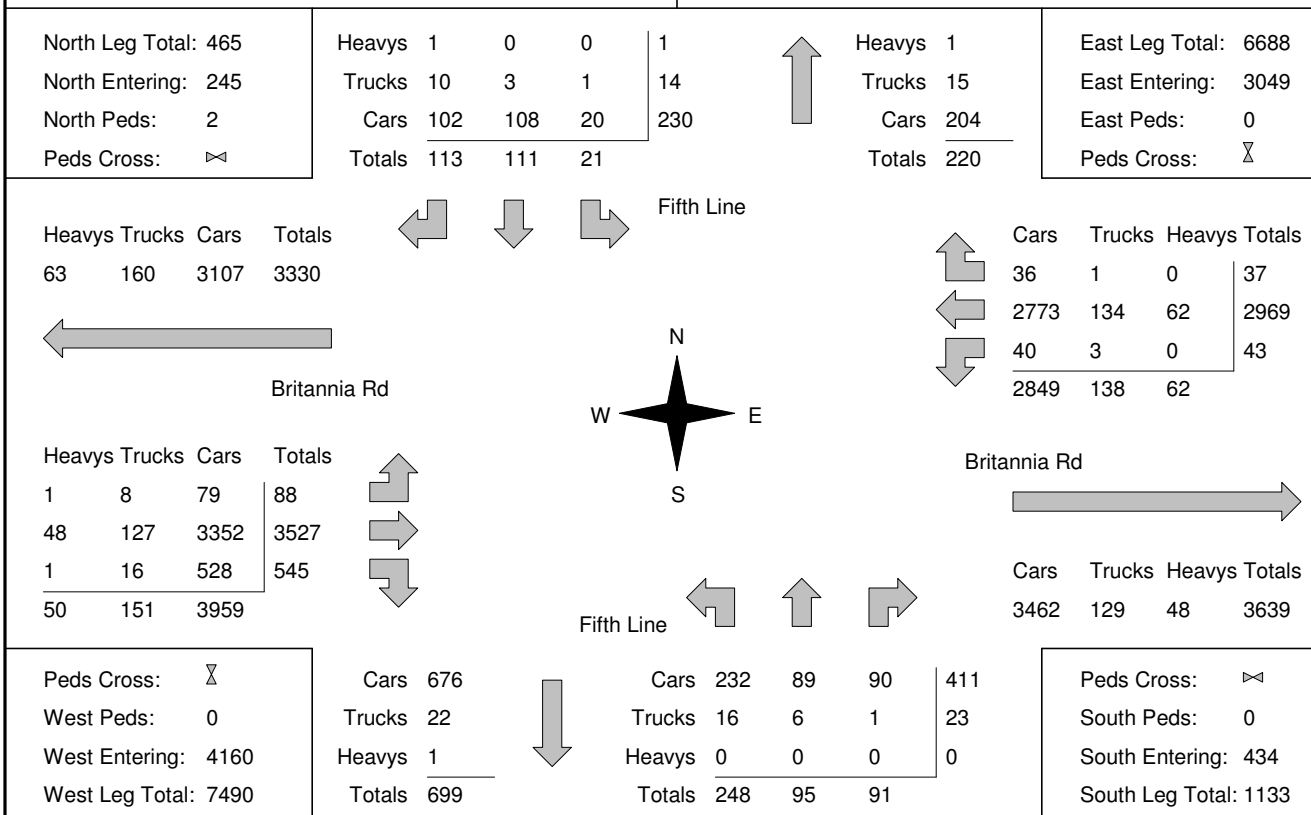
Municipality: Halton Region
Site #: 1001900100
Intersection: Britannia Rd & Fifth Line
TFR File #: 3
Count date: 3-May-2018

Weather conditions:
Rain

Person(s) who counted:
Rick W

**** Signalized Intersection ****

Major Road: Britannia Rd runs W/E



Comments

Britannia Rd @ Sixth Line

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:45:00
To: 8:45:00

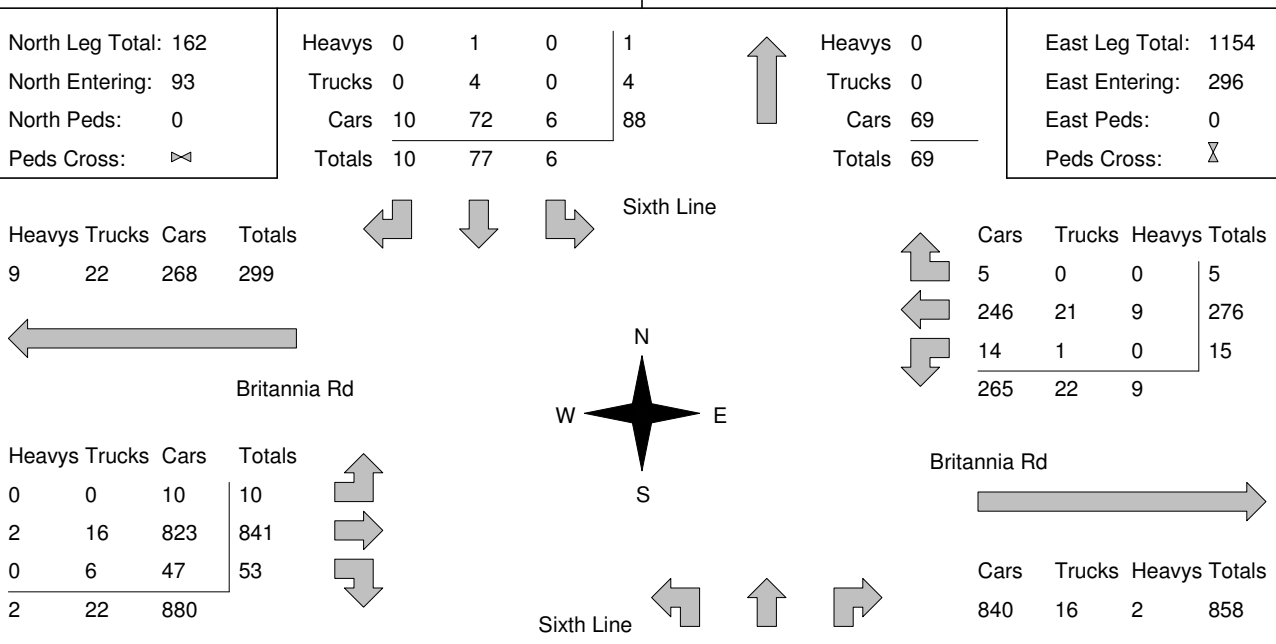
Municipality: Halton Region
Site #: 1001950100
Intersection: Britannia Rd & Sixth Line
TFR File #: 2
Count date: 19-Apr-2018

Weather conditions:
Overcast/Dry

Person(s) who counted:
Rick W

**** Signalized Intersection ****

Major Road: Britannia Rd runs W/E



Comments

Britannia Rd @ Sixth Line

Mid-day Peak Diagram

Specified Period
From: 11:00:00
To: 14:00:00

One Hour Peak
From: 11:00:00
To: 12:00:00

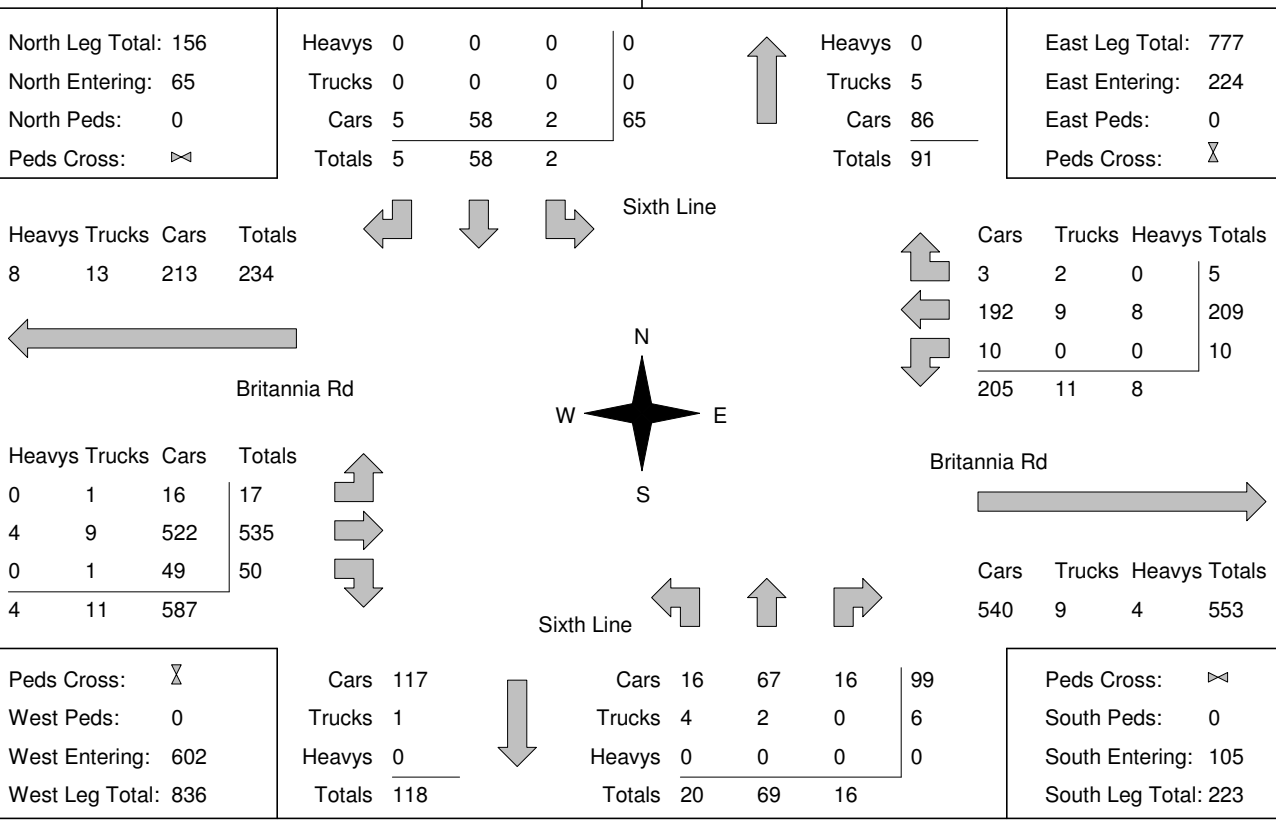
Municipality: Halton Region
Site #: 1001950100
Intersection: Britannia Rd & Sixth Line
TFR File #: 2
Count date: 19-Apr-2018

Weather conditions:
Overcast/Dry

Person(s) who counted:
Rick W

**** Signalized Intersection ****

Major Road: Britannia Rd runs W/E



Comments

Britannia Rd @ Sixth Line

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 17:00:00
To: 18:00:00

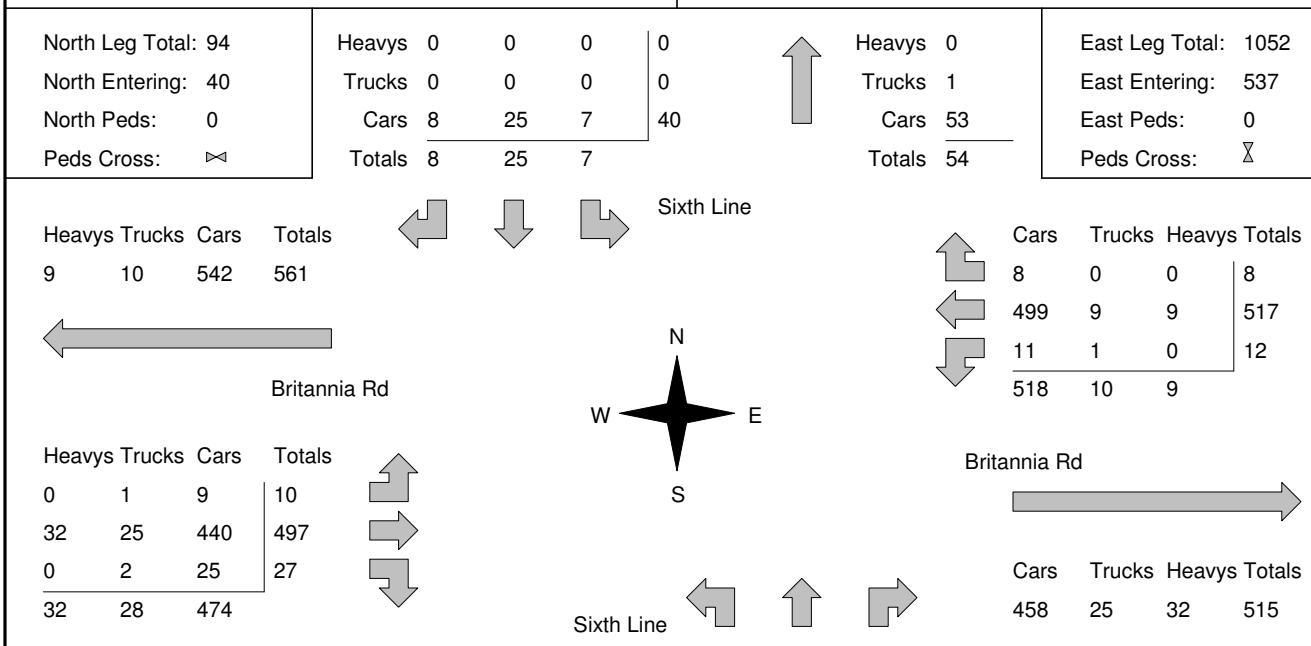
Municipality: Halton Region
Site #: 1001950100
Intersection: Britannia Rd & Sixth Line
TFR File #: 2
Count date: 19-Apr-2018

Weather conditions:
Overcast/Dry

Person(s) who counted:
Rick W

**** Signalized Intersection ****

Major Road: Britannia Rd runs W/E



Comments

Britannia Rd @ Sixth Line

Total Count Diagram

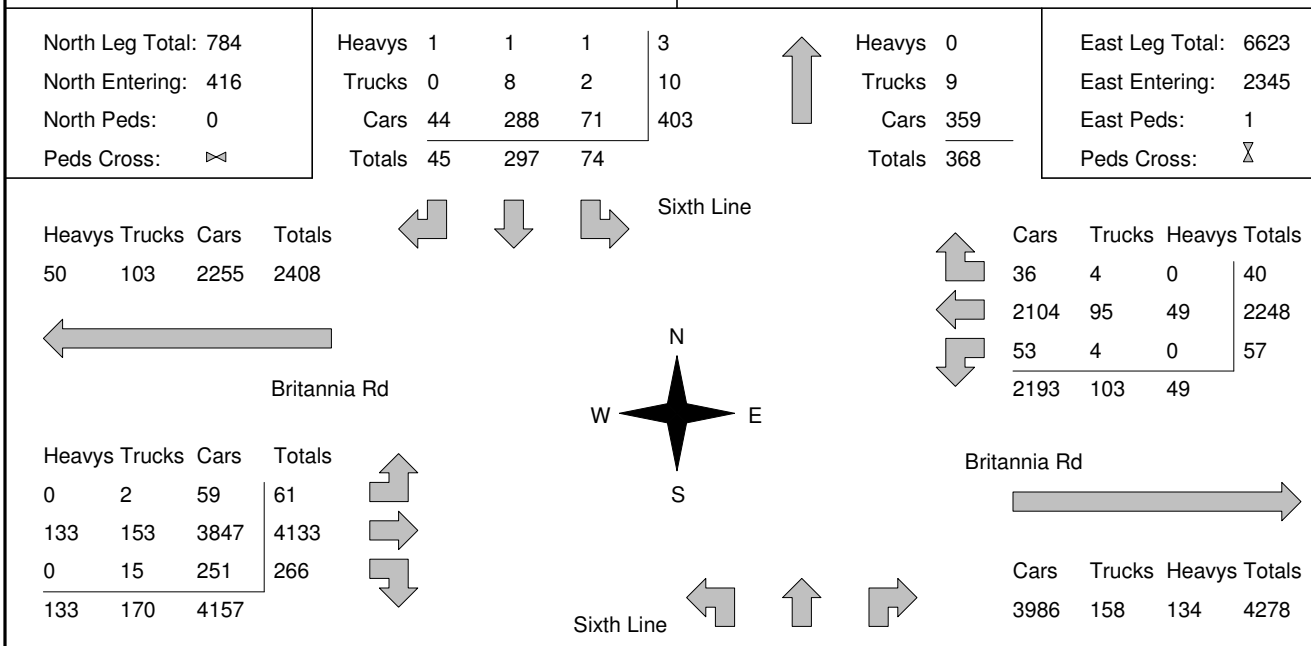
Municipality: Halton Region
Site #: 1001950100
Intersection: Britannia Rd & Sixth Line
TFR File #: 2
Count date: 19-Apr-2018

Weather conditions:
Overcast/Dry

Person(s) who counted:
Rick W

**** Signalized Intersection ****

Major Road: Britannia Rd runs W/E



Comments

Britannia Rd @ Trafalgar Rd

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: Halton Region
Site #: 0000003247
Intersection: Trafalgar Rd & Britannia Rd
TFR File #: 1
Count date: 6-Nov-2019

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Trafalgar Rd runs N/S

North Leg Total:	2009			
North Entering:	1113			
North Peds:	0			
Peds Cross:	⋈			
Heavys	12	39	6	57
Trucks	1	10	2	13
Cars	26	888	129	1043
Totals	39	937	137	
Heavys	48			
Trucks	9			
Cars	839			
Totals	896			
East Leg Total:	1619			
East Entering:	505			
East Peds:	0			
Peds Cross:	⧖			

Trafalgar Rd

Heavys	Trucks	Cars	Totals
47	8	383	438

Britannia Rd

Cars	Trucks	Heavys	Totals
68	1	6	75
247	7	9	263
167	0	0	167
482	8	15	

N
W E
S

Heavys	Trucks	Cars	Totals
4	0	36	40
7	5	605	617
8	9	279	296
19	14	920	

Britannia Rd

Cars	Trucks	Heavys	Totals
1094	7	13	1114

Trafalgar Rd

Peds Cross:	⧖			
West Peds:	0			
West Entering:	953			
West Leg Total:	1391			
Cars	1334			
Trucks	19			
Heavys	47			
Totals	1400			
Cars	110	735	360	1205
Trucks	0	8	0	8
Heavys	26	38	0	64
Totals	136	781	360	
Peds Cross:	⋈			
South Peds:	0			
South Entering:	1277			
South Leg Total:	2677			

Comments

Britannia Rd @ Trafalgar Rd

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

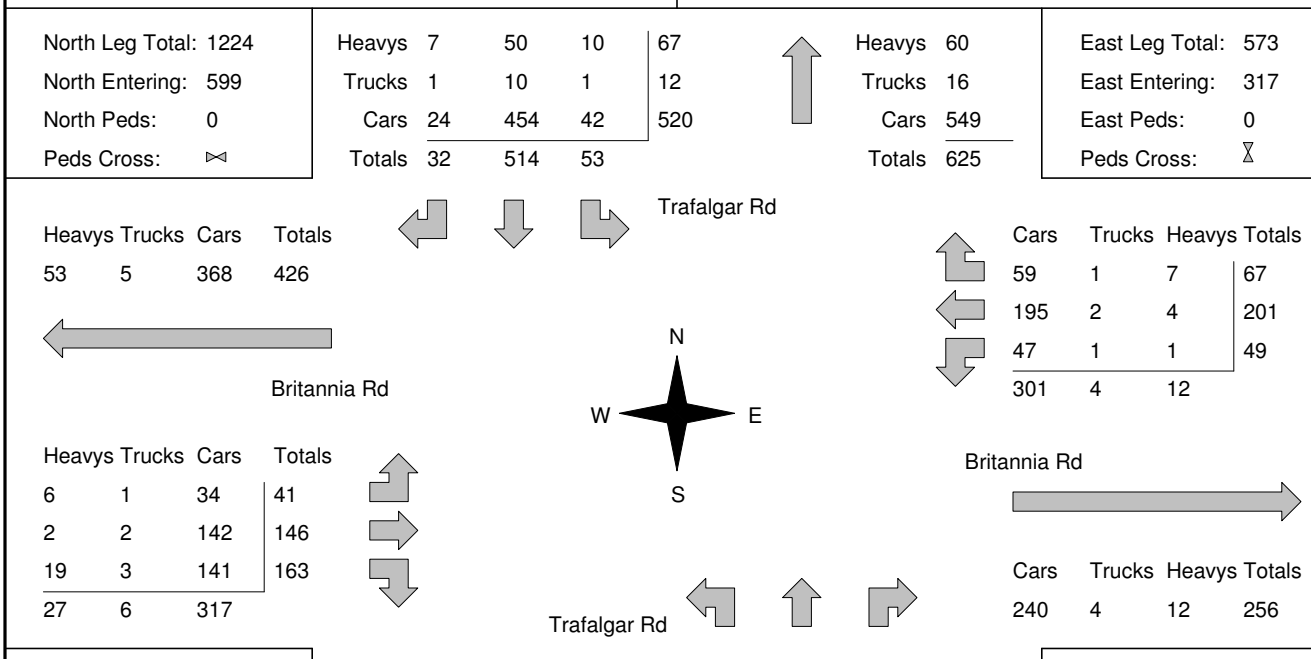
Municipality: Halton Region
Site #: 0000003247
Intersection: Trafalgar Rd & Britannia Rd
TFR File #: 1
Count date: 6-Nov-2019

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Trafalgar Rd runs N/S



Comments

Britannia Rd @ Trafalgar Rd

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:45:00
To: 17:45:00

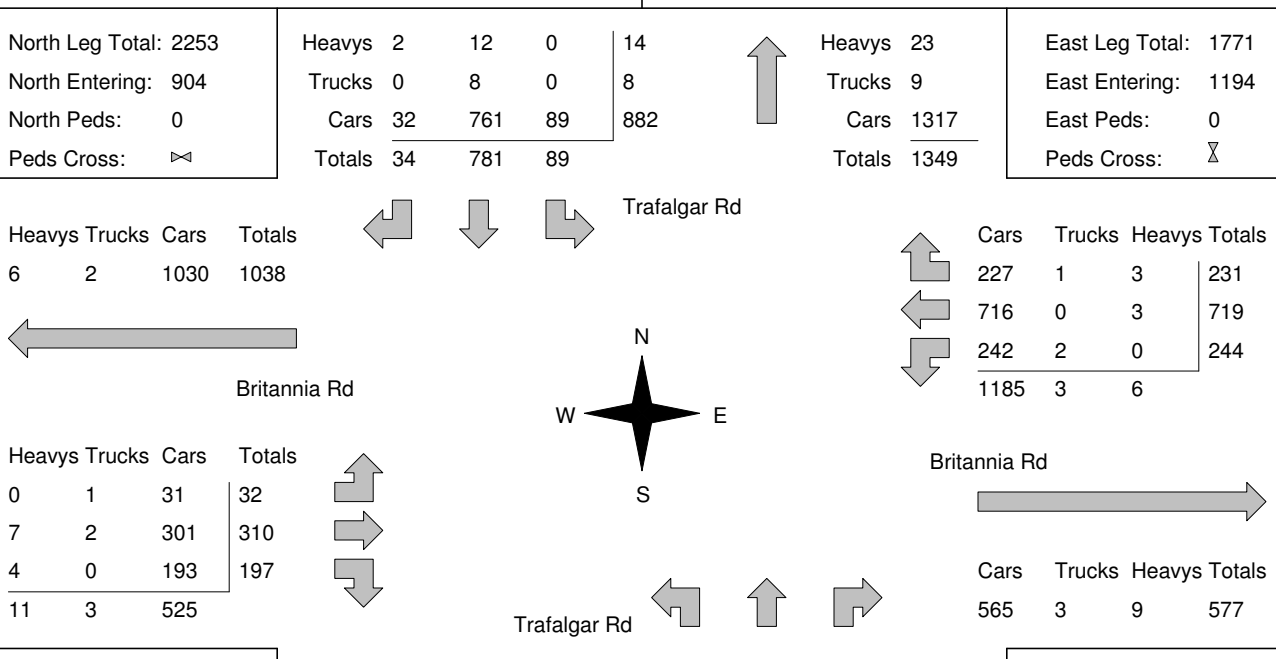
Municipality: Halton Region
Site #: 0000003247
Intersection: Trafalgar Rd & Britannia Rd
TFR File #: 1
Count date: 6-Nov-2019

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Trafalgar Rd runs N/S



Comments

Britannia Rd @ Trafalgar Rd

Municipality: Halton Region
Major Road: Trafalgar Rd
Minor Road: Britannia Rd

Date: Nov 6, 2019

Major Road Runs: North/South
Weather Conditions: Cloudy/Dry
Person No. 1 Cam
Person No. 2

Period	North Approach							East Approach							South Approach							West Approach							Veh. Summary	
	Cars			Trucks			Ped.	Cars			Trucks			Ped.	Cars			Trucks			Ped.	Cars			Trucks			Ped.		
Ending	Left	Thru	Right	Left	Thru	Right	Cross.	Left	Thru	Right	Left	Thru	Right	Cross.	Left	Thru	Right	Left	Thru	Right	Cross.	Left	Thru	Right	Left	Thru	Right	Cross.	15	60
7:15	21	244	6	2	15	0	0	19	37	22	0	0	0	0	11	108	44	0	6	1	0	9	142	77	0	1	2	0	767	
7:30	42	249	4	1	13	2	0	36	44	15	0	2	1	0	25	165	56	2	4	0	0	13	136	86	0	2	1	0	899	
7:45	37	254	6	0	11	1	0	43	55	14	0	4	2	0	28	180	70	9	12	0	0	9	152	55	0	5	0	0	947	
8:00	38	222	8	5	12	2	0	37	79	19	0	2	0	0	36	199	89	8	11	0	0	5	150	64	2	3	4	0	995	3608
8:15	30	210	7	2	12	6	0	33	52	23	0	7	1	0	23	188	106	4	12	0	0	11	152	95	0	4	6	0	984	3825
8:30	24	202	5	1	14	4	0	54	61	12	0	3	4	0	23	168	95	5	11	0	0	11	151	65	2	0	7	0	922	3848
Sum	**129**	**888**	**26**	**8**	**49**	**13**	**0**	**167**	**247**	**68**	**0**	**16**	**7**	**0**	**110**	**735**	**360**	**26**	**46**	**0**	**0**	**36**	**605**	**279**	**4**	**12**	**17**	**0**		
TMCs	**137**	**937**	**39**					**167**	**263**	**75**					**136**	**781**	**360**					**40**	**617**	**296**						
8:45	31	205	7	1	8	0	0	39	66	20	0	1	0	0	30	172	78	7	11	2	0	10	136	77	4	1	3	0	909	3810
9:00	23	172	8	1	13	4	0	43	56	24	0	5	1	0	34	161	71	15	10	1	0	14	126	63	2	3	3	0	853	3668
11:15	8	109	2	1	14	1	0	6	31	16	0	1	5	0	36	95	5	6	17	1	0	9	42	40	2	2	5	0	454	
11:30	6	106	10	0	20	1	0	11	49	7	0	3	5	0	35	114	16	7	20	0	0	9	46	46	0	1	7	0	519	
11:45	12	142	6	4	19	2	0	16	35	17	0	1	0	0	28	83	12	9	14	0	0	7	36	42	1	3	7	0	496	
12:00	6	98	7	3	12	2	0	11	33	10	0	1	3	0	36	101	10	7	17	0	0	8	44	41	2	2	8	0	462	1931
12:15	11	117	6	0	19	2	0	16	29	9	1	2	0	0	33	118	8	11	19	0	0	8	38	34	3	1	7	0	492	1969
12:30	11	100	7	0	16	3	0	11	33	9	0	5	2	0	23	117	15	7	15	3	0	12	36	47	4	3	3	0	482	1932
12:45	10	120	5	0	20	1	0	11	44	9	0	3	3	0	41	117	7	5	19	0	0	5	49	42	0	3	9	0	523	1959
13:00	8	104	13	2	20	3	0	10	44	6	0	2	0	0	39	96	7	7	11	0	0	6	54	35	3	2	13	0	485	1982
13:15	13	97	3	5	16	2	0	11	47	15	1	2	2	0	25	98	15	12	8	0	0	5	39	40	0	2	2	0	460	1950
13:30	10	123	3	2	17	1	0	8	58	14	1	0	2	0	37	123	13	12	20	0	0	7	36	39	1	0	5	0	532	2000
13:45	9	101	5	4	16	3	0	14	48	11	0	3	2	0	46	119	10	10	16	0	0	8	34	31	1	2	7	0	500	1977
14:00	10	133	13	0	11	2	0	14	42	19	0	1	2	0	41	116	18	10	17	1	0	14	33	31	5	0	8	0	541	2033
15:15	15	135	14	0	9	3	0	39	104	21	0	1	0	0	51	184	23	15	23	1	0	7	41	33	2	2	12	0	735	
15:30	22	165	11	4	7	2	0	23	121	18	0	2	0	0	72	227	29	12	15	0	0	5	51	38	3	4	6	0	837	
15:45	14	138	16	0	7	2	0	37	149	34	0	3	1	0	65	223	13	11	7	0	0	8	58	52	4	2	3	0	847	
16:00	13	167	14	0	7	2	0	34	118	38	0	3	1	0	71	244	25	8	15	0	0	9	68	34	3	1	4	0	879	3298
16:15	27	155	11	0	11	0	0	44	164	39	1	0	0	0	72	262	36	9	12	0	0	13	52	42	2	0	2	0	954	3517
16:30	28	187	13	0	5	0	0	54	175	44	1	1	0	0	67	270	29	4	5	0	0	7	66	47	3	7	3	0	1016	3696
16:45	19	187	9	0	9	4	0	43	174	64	0	4	2	0	76	288	31	2	10	0	0	7	56	59	2	4	0	0	1050	3899
17:00	25	187	12	0	9	0	0	45	185	50	0	1	1	0	73	262	43	1	8	1	0	5	72	48	0	2	2	0	1032	4052
17:15	18	163	7	0	5	1	0	68	180	63	1	2	2	0	71	274	39	1	9	1	0	6	68	40	1	3	1	0	1024	4122
17:30	22	199	11	0	2	1	0	63	174	47	0	0	0	0	70	258	46	0	7	1	0	11	85	48	0	4	1	0	1050	4156
17:45	24	212	2	0	4	0	0	66	177	67	1	0	1	0	68	265	47	1	3	0	0	9	76	57	0	0	0	0	1080	4186
Sum	**89**	**761**	**32**	**0**	**20**	**2**	**0**	**242**	**716**	**227**	**2**	**3**	**4**	**0**	**282**	**1059**	**175**	**3**	**27**	**3**	**0**	**31**	**301**	**193**	**1**	**9**	**4**	**0**		
TMCs	**89**	**781**	**34**					**244**	**719**	**231**					**285**	**1086**	**178**					**32**	**310**	**197**						
18:00	22	182	6	0	5	0	0	67	163	47	1	1	0	0	65	246	47	0	4	0	0	10	70	48	1	0	0	0	985	4139

Britannia Rd @ Trafalgar Rd

Total Count Diagram

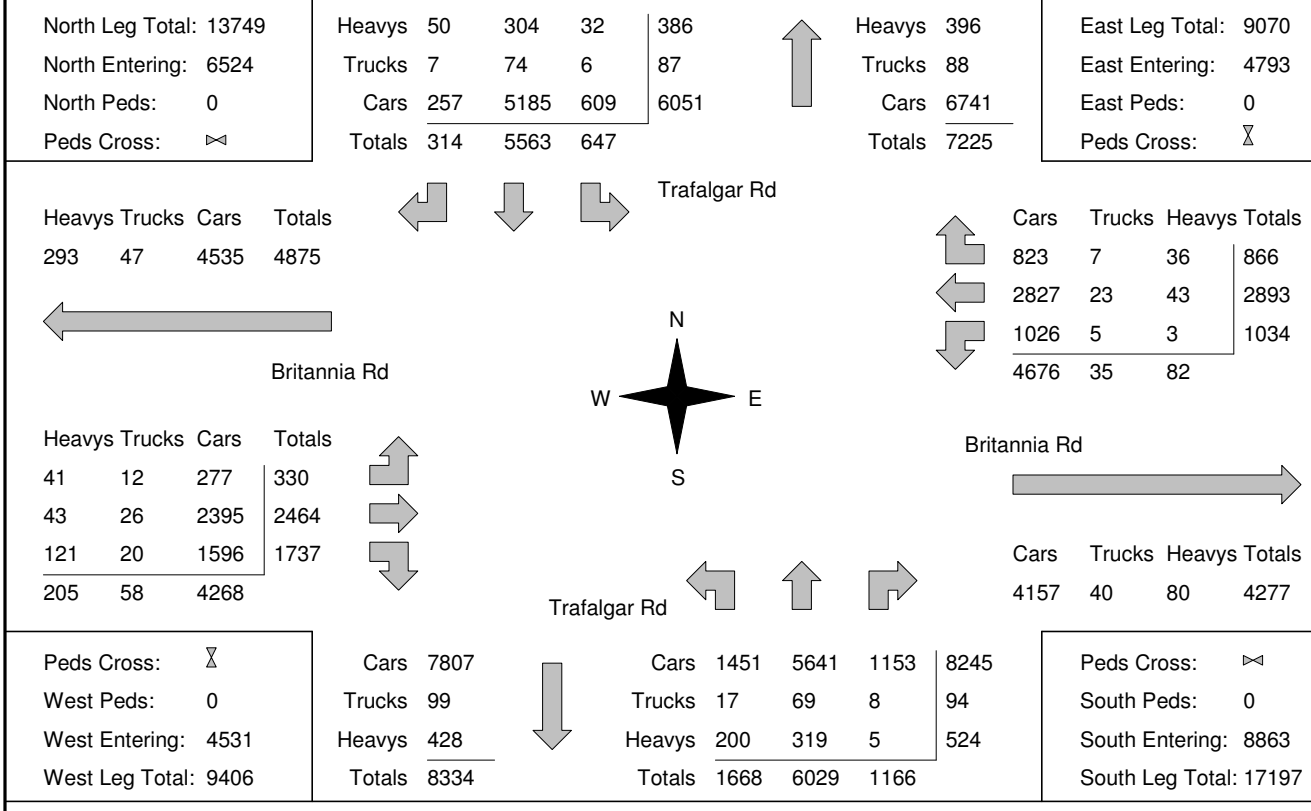
Municipality: Halton Region
Site #: 0000003247
Intersection: Trafalgar Rd & Britannia Rd
TFR File #: 1
Count date: 6-Nov-2019

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Trafalgar Rd runs N/S



Comments

James Snow Pkwy @ Louis St Laurent Ave

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:30:00
To: 8:30:00

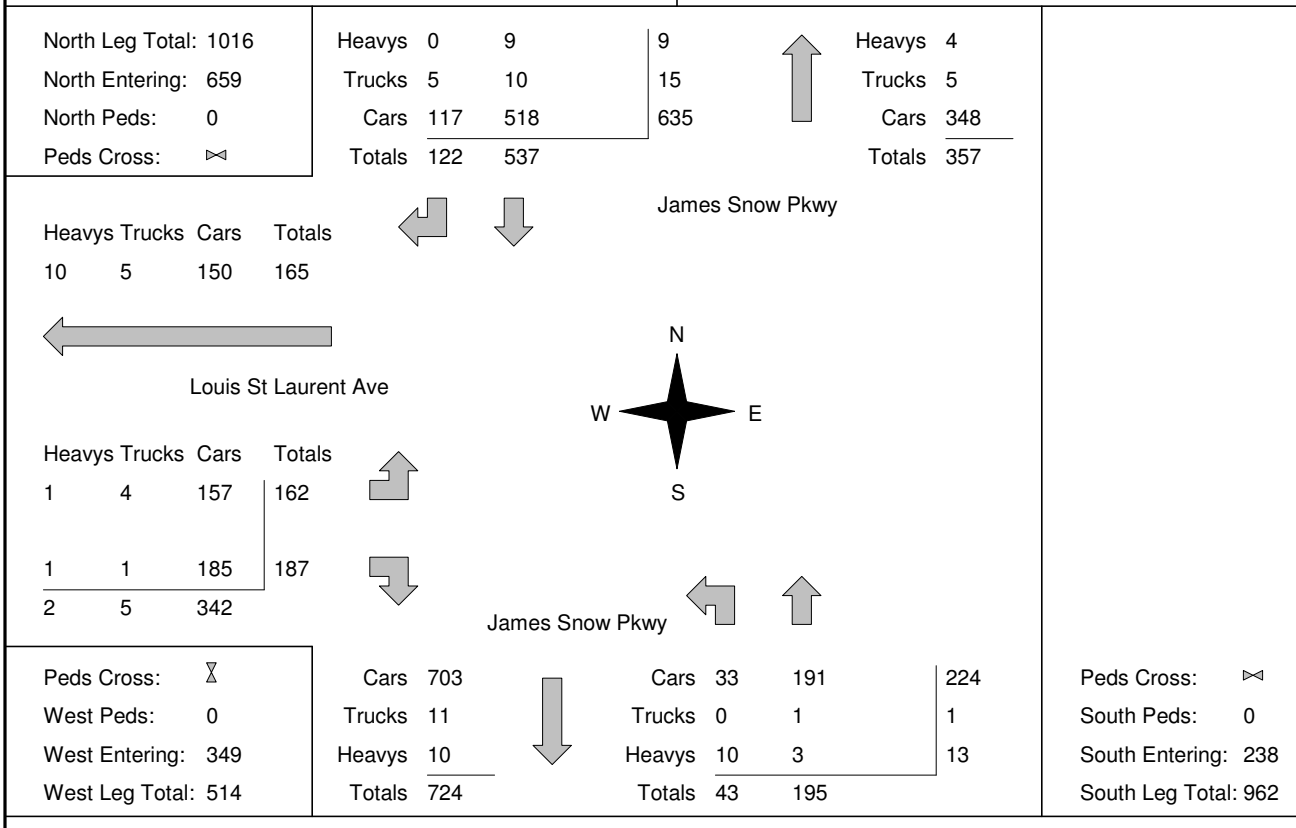
Municipality: Halton Region
Site #: 1107900100
Intersection: James Snow Pkwy & Louis St Laure
TFR File #: 2
Count date: 1-May-2018

Weather conditions:
Clear/Dry

Person(s) who counted:
Diane

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

Major Road: James Snow Pkwy runs N/S



Comments

James Snow Pkwy @ Louis St Laurent Ave

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: Halton Region
Site #: 1107900100
Intersection: James Snow Pkwy & Louis St Laure
TFR File #: 2
Count date: 1-May-2018

Weather conditions:
Clear/Dry

Person(s) who counted:
Diane

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

Major Road: James Snow Pkwy runs N/S

North Leg Total: 431
North Entering: 207
North Peds: 2
Peds Cross: ⋈

Heavys	1	9	10
Trucks	0	5	5
Cars	55	137	192
Totals	56	151	

Heavys	5		
Trucks	5		
Cars	214		
Totals	224		

James Snow Pkwy

Heavys	Trucks	Cars	Totals
5	1	115	121

Louis St Laurent Ave

N
W E
S

Heavys	Trucks	Cars	Totals
0	1	54	55
5	0	47	52
5	1	101	

James Snow Pkwy

Peds Cross: ⋈
West Peds: 0
West Entering: 107
West Leg Total: 228

Cars	184		
Trucks	5		
Heavys	14		
Totals	203		

Cars	60	160	220
Trucks	1	4	5
Heavys	4	5	9
Totals	65	169	

Peds Cross: ⋈
South Peds: 0
South Entering: 234
South Leg Total: 437

Comments

James Snow Pkwy @ Louis St Laurent Ave

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 17:00:00
To: 18:00:00

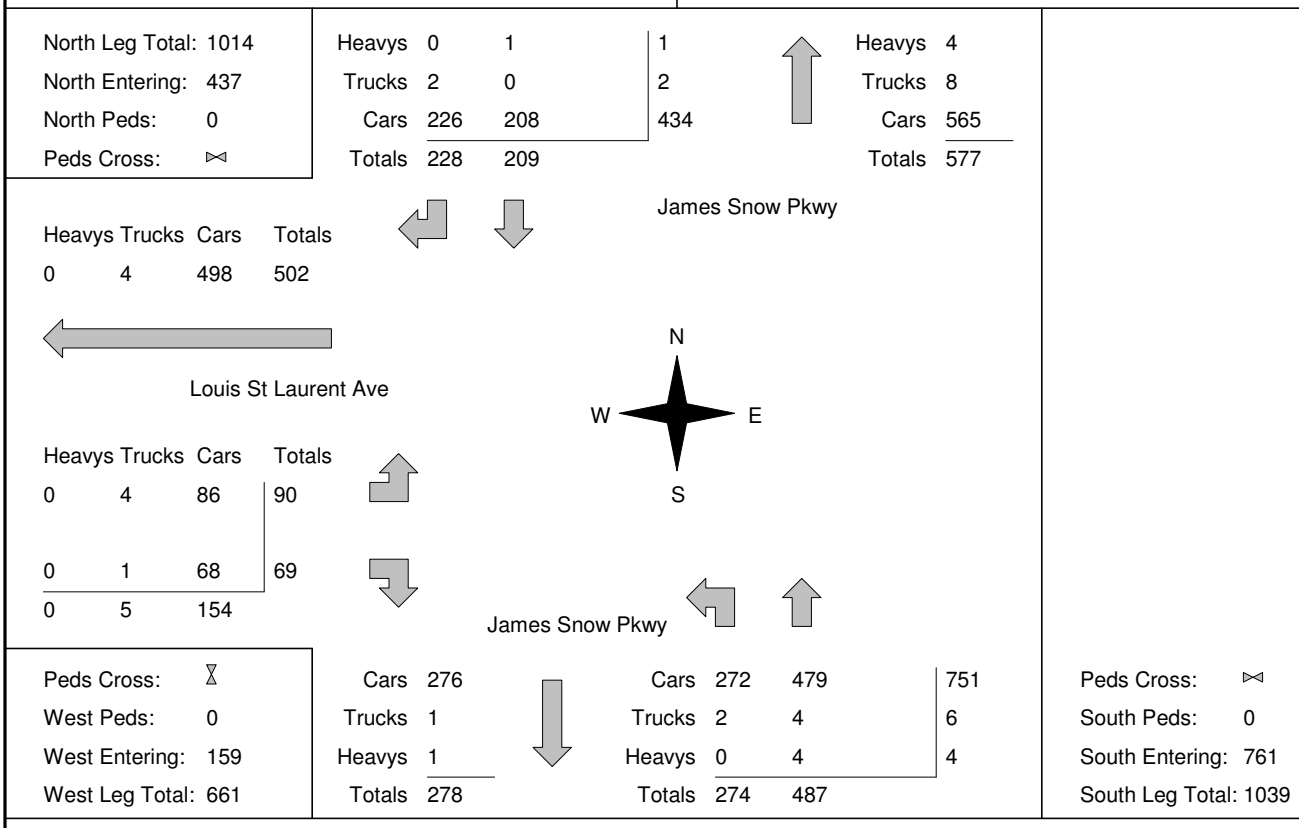
Municipality: Halton Region
Site #: 1107900100
Intersection: James Snow Pkwy & Louis St Laure
TFR File #: 2
Count date: 1-May-2018

Weather conditions:
Clear/Dry

Person(s) who counted:
Diane

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

Major Road: James Snow Pkwy runs N/S



Comments

James Snow Pkwy @ Louis St Laurent Ave

Total Count Diagram

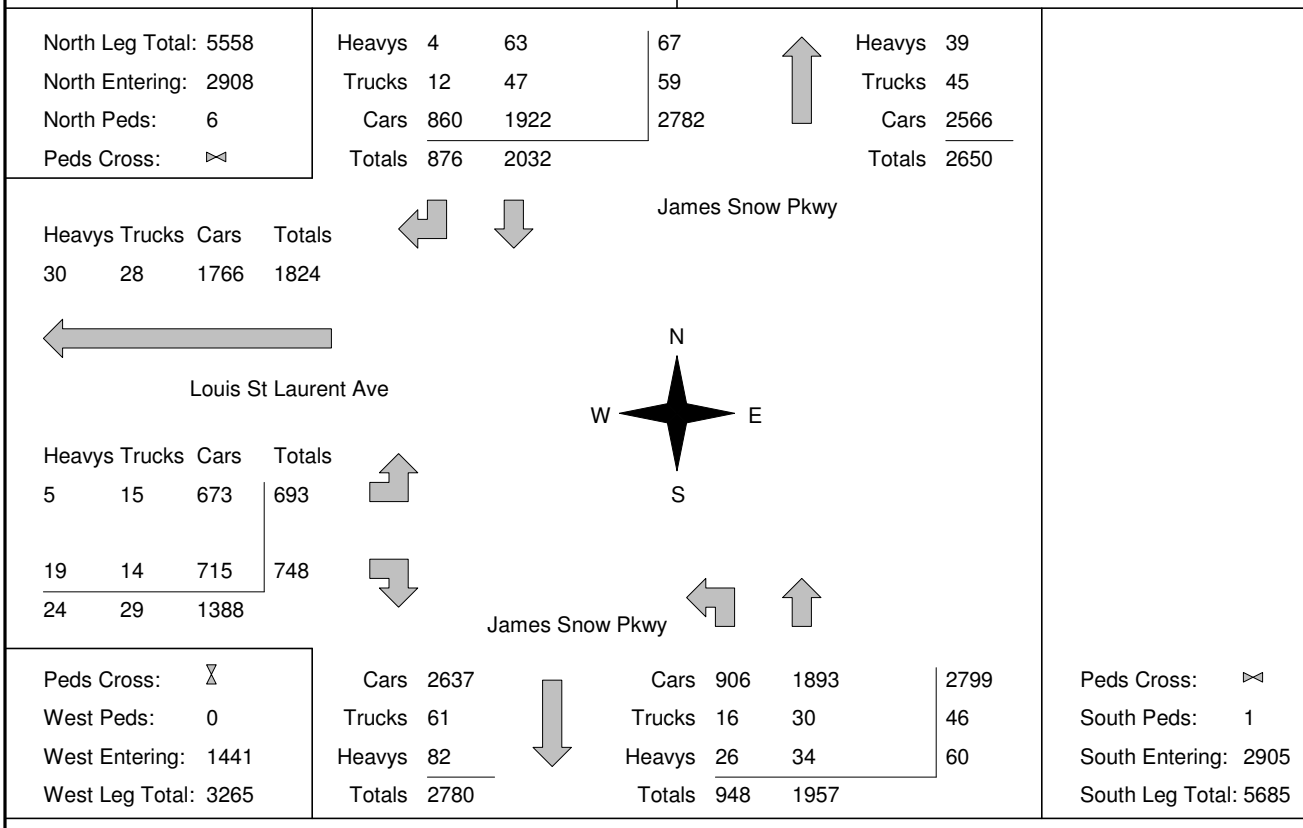
Municipality: Halton Region
Site #: 1107900100
Intersection: James Snow Pkwy & Louis St Laure
TFR File #: 2
Count date: 1-May-2018

Weather conditions:
Clear/Dry

Person(s) who counted:
Diane

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

Major Road: James Snow Pkwy runs N/S



Comments

Derry Rd @ Trafalgar Rd

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:15:00
To: 8:15:00

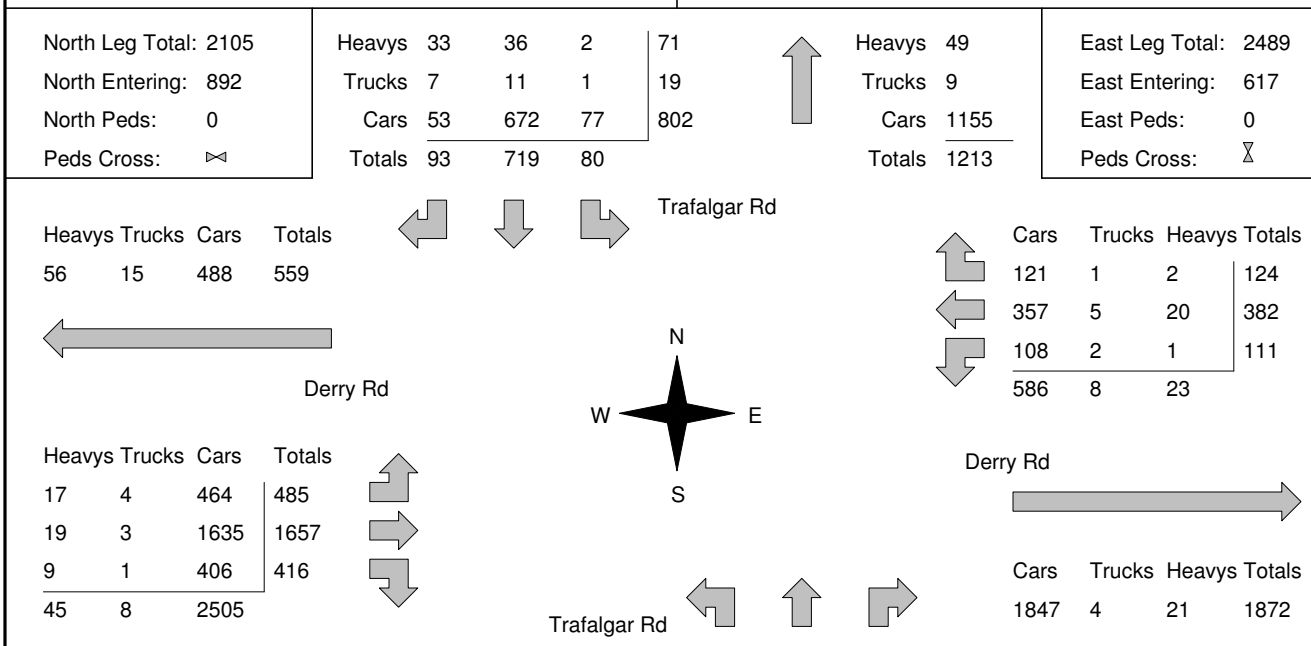
Municipality: Halton Region
Site #: 0000003263
Intersection: Derry Rd & Trafalgar Rd
TFR File #: 15
Count date: 5-Nov-2019

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Derry Rd runs W/E



Comments

Derry Rd @ Trafalgar Rd

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:45:00
To: 17:45:00

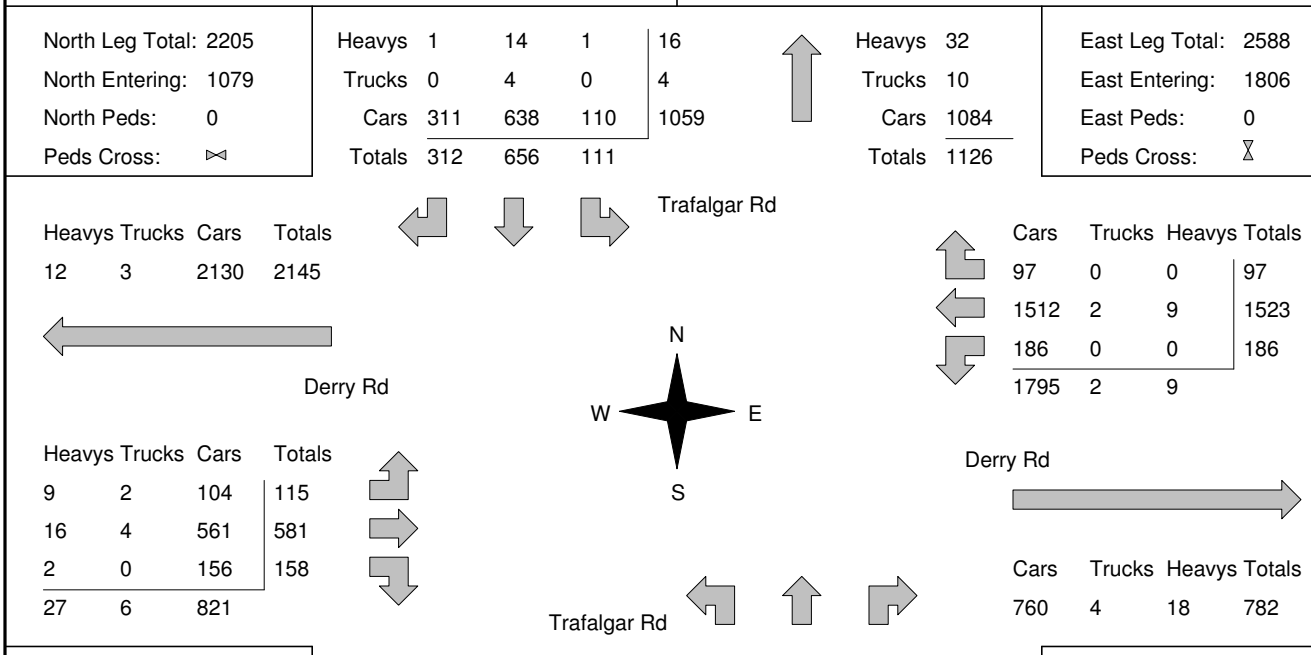
Municipality: Halton Region
Site #: 0000003263
Intersection: Derry Rd & Trafalgar Rd
TFR File #: 15
Count date: 5-Nov-2019

Weather conditions:
Clear/Dry

Person(s) who counted:
Cam

**** Signalized Intersection ****

Major Road: Derry Rd runs W/E



Comments

Derry Rd @ Trafalgar Rd

Municipality: Halton Region
Major Road: Derry Rd
Minor Road: Trafalgar Rd

Date: Nov 5, 2019

Major Road Runs: East/West
Weather Conditions: Clear/Dry
Person No. 1 Cam
Person No. 2

Period	North Approach							East Approach							South Approach							West Approach							Veh. Summary	
	Cars			Trucks			Ped.	Cars			Trucks			Ped.	Cars			Trucks			Ped.	Cars			Trucks			Ped.		
Ending	Left	Thru	Right	Left	Thru	Right	Cross.	Left	Thru	Right	Left	Thru	Right	Cross.	Left	Thru	Right	Left	Thru	Right	Cross.	Left	Thru	Right	Left	Thru	Right	Cross.	15	60
7:15	21	190	13	0	12	5	0	28	66	17	0	8	1	0	11	112	29	0	3	0	0	84	359	95	3	5	3	0	1065	
7:30	10	197	16	0	10	7	0	27	78	24	0	7	1	0	10	133	32	3	3	0	0	95	443	113	3	1	4	0	1217	
7:45	27	168	16	0	16	6	0	22	91	31	1	3	1	0	26	152	25	3	6	0	0	118	420	99	6	6	2	0	1245	
8:00	22	167	12	0	15	13	0	32	85	31	1	5	1	0	22	155	47	0	10	0	0	119	399	93	5	6	3	0	1243	4770
8:15	18	140	9	3	6	14	0	27	103	35	1	10	0	0	20	130	31	0	15	0	0	132	373	101	7	9	1	0	1185	4890
8:30	19	128	7	3	11	15	0	34	91	22	0	13	2	0	23	146	31	2	16	0	0	148	382	80	11	8	4	0	1196	4869
8:45	21	118	14	0	22	15	0	32	96	19	0	4	0	0	18	147	45	1	15	1	0	95	375	77	14	12	5	0	1146	4770
9:00	22	101	13	2	18	6	0	33	82	26	0	11	2	0	32	127	36	1	13	2	0	82	391	86	12	8	1	0	1107	4634
11:15	3	69	6	0	15	12	0	10	53	9	4	1	1	0	20	74	8	0	17	1	0	33	108	16	11	3	1	0	475	
11:30	6	67	12	0	18	23	0	20	80	11	1	8	1	0	24	94	14	3	18	0	0	31	94	34	13	7	1	0	580	
11:45	7	74	10	0	16	11	0	11	80	9	0	4	0	0	32	97	17	2	21	0	0	52	77	40	22	4	2	0	588	
12:00	6	81	15	3	22	7	0	13	76	8	1	5	0	0	26	102	14	0	13	1	0	38	101	34	19	5	4	0	594	2237
12:15	7	77	15	0	19	2	0	6	65	7	0	8	0	0	24	96	9	0	10	0	0	36	84	32	8	5	1	0	511	2273
12:30	7	90	14	1	13	3	0	10	79	6	0	6	0	0	25	100	14	4	11	0	0	40	71	37	5	6	1	0	543	2236
12:45	3	72	19	0	14	16	0	16	84	13	1	7	0	0	31	64	9	4	16	1	0	41	99	41	5	4	3	0	563	2211
13:00	7	86	19	0	14	20	0	16	69	12	2	4	0	0	28	76	14	1	27	0	0	36	89	28	9	4	3	0	564	2181
13:15	7	79	22	0	10	6	0	5	73	11	0	8	4	0	32	90	8	0	22	0	0	28	76	40	17	5	0	0	543	2213
13:30	6	87	19	0	11	13	0	15	78	9	0	6	0	0	35	94	8	1	17	0	0	38	81	25	11	4	3	0	561	2231
13:45	9	77	17	0	17	11	0	14	85	13	1	10	0	0	27	95	11	6	14	0	0	26	90	35	12	5	1	0	576	2244
14:00	10	71	19	2	14	5	0	11	105	14	1	5	0	0	27	103	9	0	9	0	0	29	90	27	14	5	1	0	571	2251
15:15	16	105	44	1	10	10	0	25	189	18	0	4	2	0	38	107	15	4	17	0	0	36	121	30	19	7	2	0	820	
15:30	8	106	42	0	6	7	0	26	268	19	0	10	1	0	55	155	15	3	11	1	0	37	120	37	12	9	2	0	950	
15:45	20	103	58	0	2	10	0	34	242	20	0	2	0	0	62	167	15	1	6	2	0	24	114	42	9	11	1	0	945	
16:00	19	104	62	0	8	10	0	37	263	22	0	7	1	0	72	203	19	2	13	0	0	31	125	27	17	6	1	0	1049	3764
16:15	18	113	68	0	5	5	0	29	263	20	1	7	0	0	65	189	16	2	14	0	0	26	119	32	11	11	0	0	1014	3958
16:30	25	166	72	1	6	1	0	43	314	13	0	6	2	0	60	229	24	1	11	0	0	29	142	47	6	3	4	0	1205	4213
16:45	22	137	59	2	0	1	0	43	404	26	0	4	1	0	79	204	17	1	12	0	0	33	116	36	8	7	0	0	1212	4480
17:00	15	161	69	0	6	1	0	51	422	30	0	3	0	0	65	246	17	1	10	0	0	29	155	41	6	5	0	0	1333	4764
17:15	35	159	87	0	5	0	0	59	341	20	0	3	0	0	77	245	26	2	7	1	0	29	136	43	2	4	0	0	1281	5031
17:30	29	176	77	0	4	0	0	38	359	22	0	3	0	0	81	226	25	0	8	0	0	25	105	39	2	5	1	0	1225	5051
17:45	31	142	78	1	3	0	0	38	390	25	0	2	0	0	84	166	21	0	6	0	0	21	165	33	1	6	1	0	1214	5053
18:00	18	140	68	0	4	3	0	42	386	21	0	3	0	0	55	152	23	0	6	0	0	31	164	39	1	1	2	0	1159	4879

Trafalgar Rd @ Lower Base Line East

Morning Peak Diagram

Specified Period
From: 7:00:00
To: 9:00:00

One Hour Peak
From: 7:30:00
To: 8:30:00

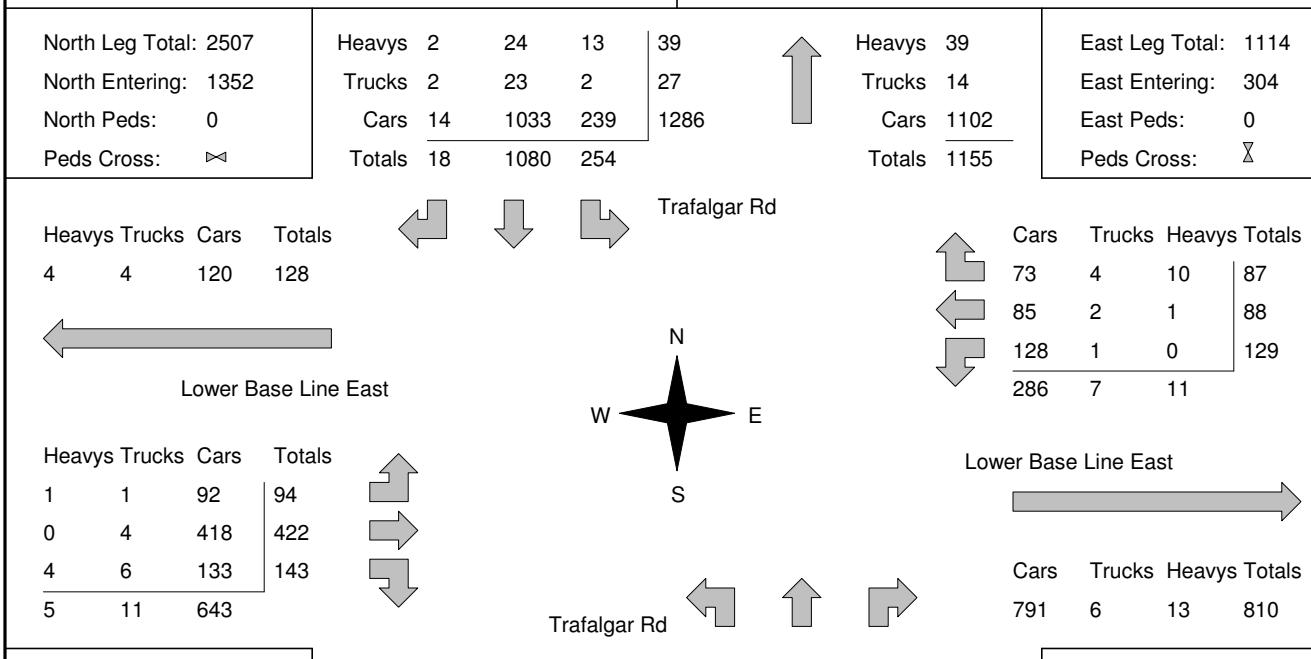
Municipality: Halton Region
Site #: 0000003025
Intersection: Trafalgar Rd & Lower Base Line Eas
TFR File #: 2
Count date: 5-Jun-2017

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Bruno
Radek

**** Signalized Intersection ****

Major Road: Trafalgar Rd runs N/S



Comments

Trafalgar Rd @ Lower Base Line East

Afternoon Peak Diagram

Specified Period
From: 15:00:00
To: 18:00:00

One Hour Peak
From: 16:45:00
To: 17:45:00

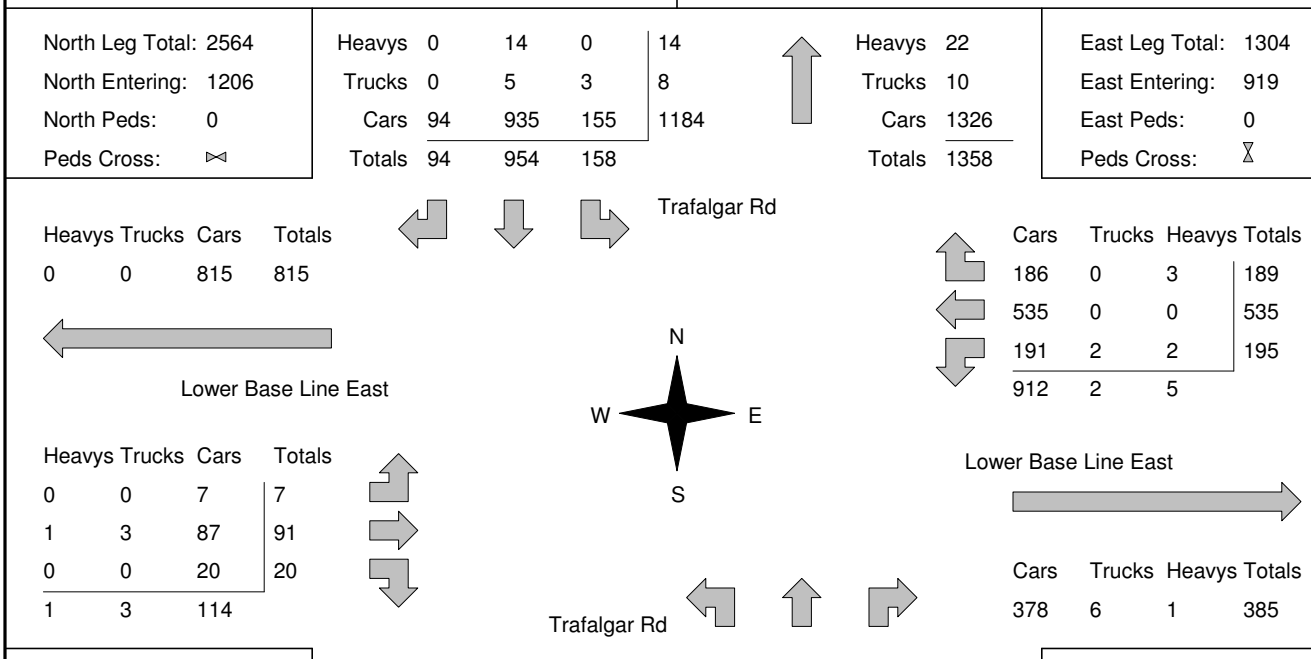
Municipality: Halton Region
Site #: 0000003025
Intersection: Trafalgar Rd & Lower Base Line Eas
TFR File #: 2
Count date: 5-Jun-2017

Weather conditions:
Cloudy/Dry

Person(s) who counted:
Bruno
Radek

**** Signalized Intersection ****

Major Road: Trafalgar Rd runs N/S



Comments

Trafalgar Rd @ Lower Base Line East

Municipality: Halton Region
Major Road: Trafalgar Rd
Minor Road: Lower Base Line East

Date: Jun 5, 2017

Major Road Runs: North/South
Weather Conditions: Cloudy/Dry
Person No. 1 Bruno
Person No. 2 Radek

Period	North Approach							East Approach							South Approach							West Approach							Veh. Summary	
	Cars			Trucks			Ped.	Cars			Trucks			Ped.	Cars			Trucks			Ped.	Cars			Trucks			Ped.		
Ending	Left	Thru	Right	Left	Thru	Right	Cross.	Left	Thru	Right	Left	Thru	Right	Cross.	Left	Thru	Right	Left	Thru	Right	Cross.	Left	Thru	Right	Left	Thru	Right	Cross.	15	60
7:15	75	203	5	3	7	0	0	22	8	15	1	0	3	0	6	157	17	2	8	0	0	12	56	25	0	0	0	0	625	
7:30	65	242	2	3	15	3	0	21	8	8	2	1	4	0	3	187	37	0	8	0	0	19	104	23	0	0	2	0	757	
7:45	65	286	0	1	12	1	0	23	24	13	0	0	4	0	2	240	28	0	7	0	0	25	111	29	1	0	2	0	874	
8:00	62	259	5	5	12	1	0	25	20	34	0	0	4	0	5	221	41	0	4	0	0	21	105	33	0	2	1	0	860	3116
8:15	56	231	4	6	9	2	0	40	16	14	1	2	2	0	5	242	37	1	12	0	0	27	108	32	1	1	2	0	851	3342
8:30	56	257	5	3	14	0	0	40	25	12	0	1	4	0	9	234	28	0	14	0	0	19	94	39	0	1	5	0	860	3445
8:45	48	230	7	3	12	0	0	38	17	16	0	2	1	0	5	203	41	0	15	0	0	23	124	44	1	0	1	0	831	3402
9:00	38	219	4	6	9	0	0	29	12	18	1	0	1	0	6	176	27	0	13	1	0	6	62	20	0	1	0	0	649	3191
11:15	21	110	1	2	10	0	0	13	15	18	0	0	5	0	3	114	6	0	10	2	0	3	17	4	1	0	0	0	355	
11:30	28	128	3	0	8	0	0	19	8	17	1	0	2	0	4	124	10	0	13	2	0	3	13	4	0	0	0	0	387	
11:45	20	101	2	3	14	1	0	19	11	18	0	1	4	0	4	120	12	1	8	0	0	5	15	9	1	1	0	0	370	
12:00	15	131	4	4	16	0	0	14	18	18	1	0	2	0	2	106	7	0	11	0	0	3	13	3	1	0	0	0	369	1481
12:15	26	113	6	2	12	0	0	14	14	12	1	0	2	0	2	126	9	0	11	0	0	4	7	5	0	1	0	1	367	1493
12:30	15	131	2	5	14	1	0	14	8	20	3	0	2	0	4	139	12	0	20	1	0	2	14	1	0	0	1	0	409	1515
12:45	16	110	5	2	12	0	0	11	21	25	2	0	5	0	4	132	13	2	16	0	0	3	11	4	0	1	0	0	395	1540
13:00	14	89	3	3	8	1	0	15	15	26	0	0	6	0	3	111	12	0	10	1	0	3	18	8	0	1	4	0	351	1522
13:15	24	125	3	1	19	0	0	14	14	20	0	0	4	0	7	116	13	0	13	2	0	3	16	6	0	0	0	0	400	1555
13:30	21	116	5	1	14	0	0	11	22	18	0	0	3	0	8	109	13	0	10	0	0	2	13	4	0	0	0	0	370	1516
13:45	30	130	2	6	16	0	0	9	15	26	0	1	2	0	9	112	12	3	9	1	0	4	8	4	0	0	0	0	399	1520
14:00	33	135	0	5	17	0	0	18	22	17	0	0	2	0	4	134	14	0	16	1	0	3	13	8	0	0	2	0	444	1613
15:15	21	184	3	3	10	2	0	18	41	44	0	1	4	0	15	152	14	0	10	1	0	3	12	4	0	1	2	0	545	
15:30	30	158	4	2	13	0	0	31	65	40	0	0	0	0	27	224	15	0	11	0	0	4	17	0	0	1	0	0	642	
15:45	27	164	12	1	6	1	0	37	84	44	0	1	1	1	17	212	21	1	14	0	0	5	20	6	0	0	0	0	674	
16:00	24	189	8	2	7	0	0	49	95	61	0	0	2	0	32	253	23	2	9	0	0	3	14	1	0	1	1	0	776	2637
16:15	28	174	8	0	6	0	0	38	101	69	0	0	1	0	19	219	18	1	17	0	0	2	20	1	2	1	0	0	725	2817
16:30	24	237	28	4	4	0	0	37	96	56	0	1	0	0	39	287	19	1	8	0	0	3	16	6	2	0	0	0	868	3043
16:45	26	179	10	1	6	0	0	54	131	74	0	1	0	0	41	288	21	0	10	1	0	2	14	12	3	1	0	0	875	3244
17:00	43	233	26	1	3	0	0	48	117	56	0	0	0	0	48	286	31	0	7	0	0	2	20	4	0	1	0	0	926	3394
17:15	36	205	18	2	3	0	0	41	142	56	3	0	2	0	39	261	15	0	7	0	0	1	16	2	0	1	0	0	850	3519
17:30	44	240	20	0	6	0	0	43	133	37	1	0	0	0	55	293	44	0	7	0	0	3	23	5	0	2	0	0	956	3607
17:45	32	257	30	0	7	0	0	59	143	37	0	0	1	0	44	293	46	0	8	0	0	1	28	9	0	0	0	0	995	3727
18:00	27	222	22	1	3	0	0	34	134	62	1	1	1	0	43	260	16	0	3	0	0	1	25	1	0	0	1	0	858	3659

APPENDIX

A-2 *SIGNAL TIMING PLANS*

Date: 23/08/2019
Intersection: Regional Road 25 @ Britannia Road

8 Phase Basic Timing Sheet

	1	2	3	4	5	6	7	8	2 Ped	4 Ped	6 Ped	8 Ped
Phases in use	X	X	X	X		X		X				
Direction	SBLT	NB	WBLT	EB		SB		WB				
Min Green	7	20	7	10		20		10				
Veh Ext.	3.0	3.2	3.0	4.0		3.2		4.0				
Yellow	3	4.2	3	4.6		4.2		4.6				
Red	1	3.1	1	2.7		3.1		2.7				
Walk		7		7		7		7				
Don't Walk		23		22		23		22				
Max 1	11	61	16	36		72		48				
Max 2												
Max 3												
Veh Recall		x				x						
Ped Recall		x				x						

Notes: Use Max 1 (22:00-6:00)

Local Zero Overide Active
Set Sync Reference to 3:15
Ped Reservice On

Date: 17-Sep-2020
Intersection: Britannia Road & Thompson Rd

8 Phase Basic Timing Sheet

	1	2	3	4	5	6	7	8	2 Ped	4 Ped	6 Ped	8 Ped
Phases in use		X		X	X	X		X				
Direction		EB		SB	EBLT	WB		NB				
Min Green		30		7	7	25		7				
Veh Ext.		5.0		5.0	3.0	5.0		5.0				
Yellow		5		5	3	5		5				
Red		2		2	1	2		2				
Walk												
Don't Walk												
Max 1		50		35	13	50		35				
Max 2		60		25	13	60		25				
Max 3		40		20	13	40		20				
Max 4												
Veh Recall												
Ped Recall												

Notes: Check timings in controller

Date: 14-May-2008
Intersection: Britannia Road & Fourth Line

8 Phase Basic Timing Sheet												
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**2 Ped**	**4 Ped**	**6 Ped**	**8 Ped**
Phases in use	X	X		X	X	X	X	X				
Direction	WBLT	EB		SB	EBLT	WB	SBLT	NB				
Min Green	7	25		10	7	25		10				
Veh Ext.	2.5	5.0		5.0	2.5	5.0		5.0				
Yellow	3	5		5	3	5		5				
Red	1	2.2		2	1	2.2		2				
Walk	-	-		-	-	-		-				
Don't Walk	-	-		-	-	-		-				
Max 1	-	50		35	10	50		35				
Max 2	10	60		25	-	60		25				
Max 3	-	40		20	-	40		20				
Max 4	-	30		20	-	30		20				
Veh Recall												
Ped Recall												

Notes: Revised September 15, 2008

Use Max I from 6:30am-9:30am *Display EBLT*
Use Max II from 3:00pm-7:00pm *Display WBLT*
Use Max III from 9:30am-3:00pm
Use Max IV from 7:00pm-6:30am

Britannia Road and James Snow Parkway

Colorado Springs

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Configuration Controller Sequence

Phase Ring Sequence and Assignment (MM) 1-1-1

Hardware Alternate Sequence Enable: No

Phase Ring Sequence.....(Note: Sequences identical to the prior one are not printed)

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	B		B		B		B		B							
Sequence 1																
Ring 1	**1**	**2**	**3**	**4**	**9**	**10**	**13**	**14**	.	.	.	.	.	.	.	.
Ring 2	**5**	**6**	**7**	**8**	**11**	**12**	**15**	**16**	.	.	.	.	.	.	.	.
Sequence 2																
Ring 1	**2**	**1**	**3**	**4**	**10**	**9**	**13**	**14**	.	.	.	.	.	.	.	.
Ring 2	**5**	**6**	**7**	**8**	**11**	**12**	**15**	**16**	.	.	.	.	.	.	.	.
Sequence 3																
Ring 1	**1**	**2**	**4**	**3**	**9**	**10**	**14**	**13**	.	.	.	.	.	.	.	.
Ring 2	**5**	**6**	**7**	**8**	**11**	**12**	**15**	**16**	.	.	.	.	.	.	.	.
Sequence 4																
Ring 1	**2**	**1**	**4**	**3**	**10**	**9**	**14**	**13**	.	.	.	.	.	.	.	.
Ring 2	**5**	**6**	**7**	**8**	**11**	**12**	**15**	**16**	.	.	.	.	.	.	.	.
Sequence 5																
Ring 1	**1**	**2**	**3**	**4**	**9**	**10**	**13**	**14**	.	.	.	.	.	.	.	.
Ring 2	**6**	**5**	**7**	**8**	**12**	**11**	**15**	**16**	.	.	.	.	.	.	.	.
Sequence 6																
Ring 1	**2**	**1**	**3**	**4**	**10**	**9**	**13**	**14**	.	.	.	.	.	.	.	.
Ring 2	**6**	**5**	**7**	**8**	**12**	**11**	**15**	**16**	.	.	.	.	.	.	.	.
Sequence 7																
Ring 1	**1**	**2**	**4**	**3**	**9**	**10**	**14**	**13**	.	.	.	.	.	.	.	.
Ring 2	**6**	**5**	**7**	**8**	**12**	**11**	**15**	**16**	.	.	.	.	.	.	.	.
Sequence 8																
Ring 1	**2**	**1**	**4**	**3**	**10**	**9**	**14**	**13**	.	.	.	.	.	.	.	.
Ring 2	**6**	**5**	**7**	**8**	**12**	**11**	**15**	**16**	.	.	.	.	.	.	.	.
Sequence 9																
Ring 1	**1**	**2**	**3**	**4**	**9**	**10**	**13**	**14**	.	.	.	.	.	.	.	.
Ring 2	**5**	**6**	**8**	**7**	**11**	**12**	**16**	**15**	.	.	.	.	.	.	.	.
Sequence 10																
Ring 1	**2**	**1**	**3**	**4**	**10**	**9**	**13**	**14**	.	.	.	.	.	.	.	.
Ring 2	**5**	**6**	**8**	**7**	**11**	**12**	**16**	**15**	.	.	.	.	.	.	.	.
Sequence 11																
Ring 1	**1**	**2**	**4**	**3**	**9**	**10**	**14**	**13**	.	.	.	.	.	.	.	.
Ring 2	**5**	**6**	**8**	**7**	**11**	**12**	**16**	**15**	.	.	.	.	.	.	.	.
Sequence 12																

Ring 1	**2**	**1**	**4**	**3**	**10**	**9**	**14**	**13**	.	.	.	.	.	.	.	.
Ring 2	**5**	**6**	**8**	**7**	**11**	**12**	**16**	**15**	.	.	.	.	.	.	.	.
Sequence 13																
Ring 1	**1**	**2**	**3**	**4**	**9**	**10**	**13**	**14**	.	.	.	.	.	.	.	.
Ring 2	**6**	**5**	**8**	**7**	**12**	**11**	**16**	**15**	.	.	.	.	.	.	.	.
Sequence 14																
Ring 1	**2**	**1**	**3**	**4**	**10**	**9**	**13**	**14**	.	.	.	.	.	.	.	.
Ring 2	**6**	**5**	**8**	**7**	**12**	**11**	**16**	**15**	.	.	.	.	.	.	.	.
Sequence 15																
Ring 1	**1**	**2**	**4**	**3**	**9**	**10**	**14**	**13**	.	.	.	.	.	.	.	.
Ring 2	**6**	**5**	**8**	**7**	**12**	**11**	**16**	**15**	.	.	.	.	.	.	.	.
Sequence 16																
Ring 1	**2**	**1**	**4**	**3**	**10**	**9**	**14**	**13**	.	.	.	.	.	.	.	.
Ring 2	**6**	**5**	**8**	**7**	**12**	**11**	**16**	**15**	.	.	.	.	.	.	.	.

Phases In Use/Exclusive Ped (MM) 1-2

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Phases In Use		X		X	X	X										
Exclusive Ped																

Phase Compatibility (MM) 1-1-2

Phase	
n/a	Barrier Mode

Phase and Overlap Descriptions

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Approach	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Movement																
Associated PED																
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Approach	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Movement																

Administration (MM) 1-7-1

Enable Controller/Cabinet Interlock CRC	No
CRC (16 bit)	20D6
Enable Automatic Backup to Datakey	No

Backup Prevent (MM) 1-1-3

Phases		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Timing	**1**		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phases	**2**	X		.	.	.	.	.	.	.	.	.	.	.	.	.	.
	3	.	.		.	.	.	.	.	.	.	.	.	.	.	.	.
	4	.	.	X		.	.	.	.	.	.	.	.	.	.	.	.
	5	.	.	.	.		.	.	.	.	.	.	.	.	.	.	.
	6	.	.	.	.	X		.	.	.	.	.	.	.	.	.	.
	7	.	.	.	.	.	.		.	.	.	.	.	.	.	.	.
	8	.	.	.	.	.	.	X		.	.	.	.	.	.	.	.
	9	.	.	.	.	.	.	.	.		.	.	.	.	.	.	.
	10	.	.	.	.	.	.	.	.	.		.	.	.	.	.	.
	11	.	.	.	.	.	.	.	.	.	.		.	.	.	.	.
	12	.	.	.	.	.	.	.	.	.	.	.		.	.	.	.
	13	.	.	.	.	.	.	.	.	.	.	.	.		.	.	.
	14	.	.	.	.	.	.	.	.	.	.	.	.	.		.	.
	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.		.
	16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	

Simultaneous Gap (MM) 1-1-4

Phases		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	1		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	2	.		.	.	.	.	.	.	.	.	.	.	.	.	.	.
	3	.	.		.	.	.	.	.	.	.	.	.	.	.	.	.
	4	.	.	.		.	.	.	.	.	.	.	.	.	.	.	.
	5	.	.	.	.		.	.	.	.	.	.	.	.	.	.	.
Phase	**6**	.	.	.	.	.		.	.	.	.	.	.	.	.	.	.
Must	**7**	.	.	.	.	.	.		.	.	.	.	.	.	.	.	.
Gap	**8**	.	.	.	.	.	.	.		.	.	.	.	.	.	.	.
With	**9**	.	.	.	.	.	.	.	.		.	.	.	.	.	.	.
Phase	**10**	.	.	.	.	.	.	.	.	.		.	.	.	.	.	.
	11	.	.	.	.	.	.	.	.	.	.		.	.	.	.	.
	12	.	.	.	.	.	.	.	.	.	.	.		.	.	.	.
	13	.	.	.	.	.	.	.	.	.	.	.	.		.	.	.
	14	.	.	.	.	.	.	.	.	.	.	.	.	.		.	.
	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.		.
	16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
	Disable	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Load Switch Assignments (MM) 1-3

	Phase / Overlap	Type	Dimming Red	Yellow	Green	Dark	Power Up	Auto Red	Yellow	Flash Together
1	1	V				-	Auto	X		
2	2	V				-	Auto	X		X
3	3	V				-	Auto	X		
4	4	V				-	Auto	X		X
5	5	V				+	Auto	X		

6	6	V	+	Auto	X	X
7	7	V	+	Auto	X	
8	8	V	+	Auto	X	X
9	2	P	-	Auto		
10	4	P	-	Auto		
11	6	P	+	Auto		
12	8	P	+	Auto		
13	1	O	-	Auto	X	
14	2	O	+	Auto	X	X
15	3	O	-	Auto	X	
16	4	O	+	Auto	X	X

Colorado Springs

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Configuration Port 1 (SDLC)

Port 1 SDLC (MM) 1-4-1

BIU	1	2	3	4	5	6	7	8
Term & Facility	X	X						
Detector Rack	X							

Enable TS2/MMU Type Cabinet: No
Enable MMU Extended Status: No
Enable SDLC Stop Time: No
Enable 3 Critical RFE's Lockup: Yes

MMU Program (MM) 1-4-2

Channel Can Serve
With Channel
Channel 1 Channel 2

Color Check Enable (MM) 1-4-3

Enable Color Check: No

MMU/LS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Green																
Yellow																
Red																

Secondary Stations/Tests (MM) 1-4-4

ID	1	2	3	4	5	6	7	8	MMU
Term & Facility									

ID	1	2	3	4	5	6	7	8	Diag
Detector Rack									

Enable SDLC Diagnostic Test: No

Colorado Springs

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Configuration Communications 1 (SDLC)

Ethernet Port Configuration (MM) 1-5-1

DHCP Enable:	No
Controller IP:	10.70.10.51
Subnet Mask:	255.255.255.0
Default Gateway IP:	10.70.10.1
Server IP:	10.70.10.1

NTCIP (MM) 1-5-5

NTCIP Backup Time (Sec):	0
NTCIP UDP Port:	501
Ethernet Priority:	1
Port 2 Priority (Port C50S for 2070):	4
Port 3A Priority (Port C21S for 2070):	2
Port 3B Priority (Port C22S for 2070):	3

Port Configuration (MM) 1-5-2 to 1-5-4

Port	2 (C50S)	3A (C21S)	3B (C22S)
Comm Module	None	Auto	Auto
Protocol	TERMINAL	NTCIP	ECPIP
Enable	No	No	No
Data Rate (BPS)	9600	19.2K	1200
Data, Parity, Stop	8 N 1	8 N 1	8 N 1
Address	0	0	0
Telemetry Response Delay	0.0	0.0	0.9
Duplex - Half or Full	Half	Full	Full
Flow Control	Yes	Yes	Yes
Group Address	0	0	0
Single Flag Enable	Yes	Yes	Yes
RTS to CTS Delay	n/a	n/a	14.0
RTS Turn Off Delay	n/a	n/a	2.0
Dropout Time	10	10	10
Early RTS	n/a	n/a	No
Telemetry Mode	n/a	n/a	FSK
ATCS Railroad	0	n/a	n/a
ATCS Railroad Line	0	n/a	n/a
ATCS Group	0	n/a	n/a
Wayside Device	0	n/a	n/a
ATC Device	0	n/a	n/a
Wayside Subnode	0	n/a	n/a
ATC Subnode	0	n/a	n/a

ECPIP (MM) 1-5-6

Controller Address:	0
Expanded System Detector Address:	0

System Detector Assignment

System Detector	Local Detector

Wireless Configuration (MM) 1-5-7

Wireless Channel Number: 6

Wireless Access Code: 327723274

Colorado Springs

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Configuration Logging / Display

Event Logging (MM) 1-6-1

Critical RFE's (MMU/TF)	Yes	3 Critical Errors Within 24 Hours	Yes
MMU Flash Faults	Yes	Local Flash Fault	Yes
Non-Critical RFE's (Det/Test)	Yes	Detector Errors	Yes
Coordination Errors	Yes	Controller Download	Yes
Preemption Events	Yes	TSP Events	Yes
Power On/Off	Yes	Low Battery	Yes
Access	Yes	Data Change	Yes
Online / Offline	Yes		

Alarm Event	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Enable Logging	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Display Options (MM) 1-7-2

Key Click Enable:	Yes
Switch to Graphics Mode:	No
LED Mode:	Auto
Display Mode:	Basic
Trans Mode Pop-Up Disable:	No

Sign On (MM) 8-5

Sign On Message Line 1: Dual Walk Term & Call Next Thru
Sign On Message Line 2:

Software Modules (MM) 8-7

Application Version: 32.66.10
OS (Boot) Version: 06.07.00

Colorado Springs

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Logic Processor Page 1

Logic Statement Control (MM) 1-8-1

Logic #	Statement Control

Colorado Springs

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Logic Processor Page 2

Logic Statements (MM) 1-8-2

Colorado Springs

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Controller Timing Plan (MM) 2-1

EB SB EBL WB Plan 1 - ""

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**
Min Green	0	25	0	15	7	25	0	0	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	0	0	7	0	7	0	0	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	0	0	8	0	21	0	0	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	3.0	5.0	3.0	5.0	2.5	5.0	3.0	3.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	0	50	35	40	7	50	35	35	35	35	35	35	35	35	35	35
Max2	0	60	40	30	7	60	40	40	40	40	40	40	40	40	40	40
Max3	0	50	0	20	7	50	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	4.0	3.0	5.0	3.0	4.0	3.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	0.0	3.0	0.0	2.0	0.0	3.0	0.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Plan 2 - ""

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**
Min Green	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	16	0	16	0	16	0	16	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Max2	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Plan 3 - ""

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**
Min Green	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	16	0	16	0	16	0	16	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Max2	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Plan 4 - ""

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**
Min Green	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	16	0	16	0	16	0	16	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Max2	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Colorado Springs

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Controller Overlaps

Vehicle Overlaps (MM) 2-2

Overlap	Type	Lag Green	Yellow	Red	Adv. Green

Overlap	Phase	Phases Included	Protect	Ped Protect	Not Overlap	Modifier	Lag X Phases	Lag 2 Phases	Flash Green

Overlap	Protected Phase (Left Turn)	Permissive Phase (Opposing Thru)	PPLT FYA Flashing Arrow Output	Flashing Arrow Output CH	Delay Start of FYA	Delay Start of Clearance	Action Plan SF Bit Disable	Ped Protected Enable

Guaranteed Minimum Time Data (MM) 2-4

Phase	Min Green	Walk	Ped Clear	Yellow	Red Clear	Overlap Green
A01	5	0	7	3.0	0.0	5
B02	5	0	7	3.0	0.0	5
C03	5	0	7	3.0	0.0	5
D04	5	0	7	3.0	0.0	5
E05	5	0	7	3.0	0.0	5
F06	5	0	7	3.0	0.0	5
G07	5	0	7	3.0	0.0	5
H08	5	0	7	3.0	0.0	5
I09	5	0	7	3.0	0.0	5
J10	5	0	7	3.0	0.0	5
K11	5	0	7	3.0	0.0	5
L12	5	0	7	3.0	0.0	5
M13	5	0	7	3.0	0.0	5
N14	5	0	7	3.0	0.0	5
O15	5	0	7	3.0	0.0	5
P16	5	0	7	3.0	0.0	5

Colorado Springs

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Controller Pedestrian Overlaps

Vehicle / Pedestrian Overlaps (MM) 2-3	
Included	Pedestrian Overlaps

Colorado Springs

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Controller Start / Flash Data (MM) 2-5

Start Up

Phase	Phase Setting
1	.
2	R
3	.
4	.
5	.
6	R
7	.
8	.
9	.
10	.
11	.
12	.
13	.
14	.
15	.
16	.

Overlap
A
B
C
D

Flash Thru Mon:	No
Flash Time:	0
All Red:	0
Power Start Seq:	1
MUTCD Enabled:	No
Y->G:	n/a

Automatic Flash

Entry
2
6

Exit
2
6

Overlap Exit
A
B
C
D

Flash Thru Mon:	No
Exit Flash:	W
Minimum Flash:	8
Mimimum Recall:	No
Cycle Through Phase:	No

Colorado Springs

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Controller Options

Controller Options (MM) 2-6-1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Flashing Grn Ph	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Guar Passage																
Non-Act I		X				X										
Non-Act II																
Dual Entry		X		X		X		X								
Cond Service																
Cond Reservice																
Ped Re-Service																
Rest In Walk																
Flashing Walk																
Ped Clr-Yel																
Ped Clr-Red																
IGRN + Veh Ext																

Ped Clear Protect: Off Unit Red Revert: 2.0 MUTCD 3 Seconds Don't Walk: No

Pre-Timed Mode (MM) 2-7

Enable Pre-Timed Mode: No Free Input Disables Pre-Timed: No

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Pre-Timed																

Phase Recall Options (MM) 2-8

Plan # 1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Lock Detector									X	X	X	X	X	X	X	X
Vehicle Recall		X				X										
Ped Recall																
Max Recall																
Soft Recall																
No Rest																
AI Calc																

Colorado Springs

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Coordination Options
Options (MM) 3-1

Manual Pattern	Auto	ECPI Coord	Yes
System Source	TBC	System Format	STD
Splits In	Seconds	Offsets In	Seconds
Transition	Smooth	Max Select	MAXINH
Dwell / Add Time	0		
Delay Coord Wk-LZ	No	Force Off	Float
Offset Reference	Lag	Use Ped Time	Yes
Ped Recall	No	Ped Reservice	No
Local Zero Override	No	FO Added Ini Green	No
Re-sync Count	0	Multisync	No

Auto Perm Minimum Green (Seconds) (MM) 3-4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Split Demand (MM) 3-5

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Demand 1																
Demand 2																

Demand	1	2
Detector	0	0
Call Time (Sec)	0	0
Cycle Count	0	0

Colorado Springs

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Coordination Pattern Data
Coordinator Pattern Data (MM) 3-2

Colorado Springs

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Coordination Split Pattern
Split Pattern Data (MM) 3-3

Colorado Springs

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Preempt Plan

Preempt Plan (MM) 4-1

Preempt Plan 3

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Trk Clr Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Trk Clr Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Enable Trailing	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dwell Veh	.	X	.	.	.	X	.	.	.	.	.	.	.	.	.	.
Dwell Ped																
Dwell Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Ped																
Cycling Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Exit Phases				X												
Exit Calls																
Special Function																

Enable	Yes	Preempt Override	Yes	Interlock Enable	No
Det Lock	Yes	Delay	0	Inhibit	0
Override Flash	No	Duration	10	CLR > GRN	No
Term Ovlp Asap	No	PC Through Yel	No	Terminate Phase	No
Ped Dark	No	Track Clear Rsrv	No	Dwell Flash	Off
Linked Pmt	0	FL Exit Color	Grn	Exit Options	Off
Exit Timing Plan	0	Reservice	0	Fault Type	Hard

Ring	1	2	3	4
Free During Pmt	No	No	No	No

Timing	Walk	Ped Clr	Min Grn	Yellow	Red
Entrance	0	5	5	4.0	1.0
	Min Grn	Ext Grn	Max Grn	Yellow	Red
Track Clear	0	0	0	4.0	1.0
	Min Dwell	Pmt Ext	Max Time	Yellow	Red
Dwell / Cycle-Exit	0	0.0	0	4.0	1.0

On Preempt Act Dwell No

Preemption Active Out			
Other - Priority Preempt	Off	Non-Priority Pmt	Off
Inhibit Extension Time	0.0	Ped Priority Return	Off
Veh Priority Return	Off	Queue Delay	Off
Conditional Delay	Off		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Pri Return %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Preempt Plan 4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Trk Clr Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Trk Clr Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Enable Trailing	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dwell Veh	.	.	.	X	.	.	.	.	.	.	.	.	.	.	.	.
Dwell Ped																
Dwell Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Ped																
Cycling Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Exit Phases		X				X										
Exit Calls																
Special Function																

Enable	Yes	Preempt Override	Yes	Interlock Enable	No
Det Lock	Yes	Delay	0	Inhibit	0
Override Flash	No	Duration	10	CLR > GRN	No
Term Ovlp Asap	No	PC Through Yel	No	Terminate Phase	No
Ped Dark	No	Track Clear Rsrv	No	Dwell Flash	Off
Linked Pmt	0	FL Exit Color	Grn	Exit Options	Off
Exit Timing Plan	0	Reservice	0	Fault Type	Hard

Ring	1	2	3	4
Free During Pmt	No	No	No	No

Timing	Walk	Ped Clr	Min Grn	Yellow	Red
Entrance	0	5	5	4.0	1.0
	Min Grn	Ext Grn	Max Grn	Yellow	Red
Track Clear	0	0	0	4.0	1.0
	Min Dwell	Pmt Ext	Max Time	Yellow	Red

Dwell / Cycle-Exit	0	0.0	0	4.0	1.0

Preemption Active Out	On	Preempt Act Dwell	No
Other - Priority Preempt	Off	Non-Priority Pmt	Off
Inhibit Extension Time	0.0	Ped Priority Return	Off
Veh Priority Return	Off	Queue Delay	Off
Conditional Delay	Off		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Pri Return %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Colorado Springs

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Preempt Preempt Filtering

Enable Preempt Filtering & TSP/SCP (MM) 4-2

Input	Solid	Pulsing
1	...BYPASSED...	...BYPASSED...
2	...BYPASSED...	...BYPASSED...
3	PREEMPTION 3	PREEMPTION 7
4	PREEMPTION 4	PREEMPTION 8
5	PREEMPTION 5	PREEMPTION 9
6	PREEMPTION 6	PREEMPTION 10
7	...BYPASSED...	...BYPASSED...
8	...BYPASSED...	...BYPASSED...
9	...BYPASSED...	...BYPASSED...
10	...BYPASSED...	...BYPASSED...

Colorado Springs

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Preempt TSP/SCP Plan and Split

TSP / SCP Plan (MM) 4-3

TSP/SCP Plan	Enable Option	Signal Type	Det Lock	Delay Time	Max Presence	PMT Enables Reservice	No Delay in TSP	Action SF Inhibit	Reservice Cycles	Bus Heading
1	No	Solid	No	0	0	No	False	0	0	NB
2	No	Solid	No	0	0	No	False	0	0	SB
3	No	Solid	No	0	0	No	False	0	0	EB
4	No	Solid	No	0	0	No	False	0	0	WB
5	No	Solid	No	0	0	No	False	0	0	.
6	No	Solid	No	0	0	No	False	0	0	.

Mode: TSP
Free Default Pattern: 120
Headway Allowance: 100

TSP/SCP Plan	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

TSP / SCP Split Pattern (MM) 4-4

TSP/SCP Split Pattern	Max Type	Phase 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
4	Max Reduction	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255

Colorado Springs

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Time Base Clock/Calendar

Clock/Calendar Data (MM) 5-1

Manual Action Plan:	0
SYNC Reference Time:	03:15
SYNC Reference:	Reference Time
Day Light Savings:	USDLS
Time Reset Input Set Time:	3:30:00
Standard Time From GMT:	-5

Colorado Springs

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Time Base Action Plan
Action Plan (MM) 5-2

Action Plan - 1 - "1"

Pattern	1	Override Sys	No
Timing Plan	1	Sequence	0
Veh Detector Plan	0	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	0	Ped Det Diag Plan	0
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.					

Action Plan - 2 - "2"

Pattern	2	Override Sys	No
Timing Plan	1	Sequence	0
Veh Detector Plan	0	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	0	Ped Det Diag Plan	0
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2		X		X	X	X										
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.					

Action Plan - 3 - "3"

Pattern	3	Override Sys	No
Timing Plan	1	Sequence	0
Veh Detector Plan	0	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	0	Ped Det Diag Plan	0
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Recall																
Max Recall																
Max 2																
Max 3		X		X	X	X										
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.					

Colorado Springs

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Time Base Day Plan/Schedule
Day Plan (MM) 5-3

Day Plan #1 - "1"

Event	Action Plan	Start Time
1	1	06:30
2	2	15:00
3	3	09:30
4	3	19:00

Day Plan #2 - "2"

Event	Action Plan	Start Time
1	99	00:00
2	2	09:00
3	3	15:00
4	99	19:00

Schedule (MM) 5-4

Schedule Number - 1

Day Plan No.: 1

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
	X	X	X	X	X	X	X

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
	X	X	X	X	X	X	X	X	X	X	X
	23	24	25	26	27	28	29	30	31		
	X	X	X	X	X	X	X	X	X		

Schedule Number - 2

Day Plan No.: 2

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	12	13	14	15	16	17	18	19	20	21	22
	23	24	25	26	27	28	29	30	31		

Colorado Springs

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Time Base Exceptions

Exception Day Program (MM) 5-5

Excep Day	Float/Fixed	Mon/Mon	DOW/DOM	WOM/Year	Day Plan

Colorado Springs

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Detectors
Detectors - Pg 1

Veh Det Phase Assignment (MM) 6-1

Vehicle Detector Plan Number - 1

Veh Detector	Assigned Phase	Called Phase	Type
1	1		N
2	2		N
3	3		N
4	4		N
5	5		N
6	6		N
7	4		N
8	4		N
9	4		N
10	5		N
11	11		N
12	12		N
13	13		N
14	14		N
15	15		N
16	16		N

Vehicle Detector Plan Number - 2

Veh Detector	Assigned Phase	Called Phase	Type
1	1		N
2	2		N
3	3		N
4	4		N
5	5		N
6	6		N
7	7		N
8	8		N
9	9		N
10	10		N
11	11		N
12	12		N
13	13		N
14	14		N
15	15		N
16	16		N

Vehicle Detector Plan Number - 3

Veh Detector	Assigned Phase	Called Phase	Type
1	1		N
2	2		N
3	3		N
4	4		N
5	5		N
6	6		N
7	7		N
8	8		N
9	9		N
10	10		N
11	11		N
12	12		N
13	13		N
14	14		N
15	15		N
16	16		N

Vehicle Detector Plan Number - 4

Veh Detector	Assigned Phase	Called Phase	Type
1	1		N
2	2		N
3	3		N
4	4		N
5	5		N
6	6		N
7	7		N
8	8		N
9	9		N
10	10		N
11	11		N
12	12		N
13	13		N
14	14		N
15	15		N
16	16		N

Vehicle Detector Setup (MM) 6-2

Veh Detector	Type	TS2 Detector	Description
1	N-NTCIP	Yes	
2	N-NTCIP	Yes	
3	N-NTCIP	Yes	
4	N-NTCIP	Yes	
5	N-NTCIP	Yes	
6	N-NTCIP	Yes	
7	N-NTCIP	Yes	
8	N-NTCIP	Yes	
9	N-NTCIP	Yes	
10	N-NTCIP	Yes	

11	N-NTCIP	Yes
12	N-NTCIP	Yes
13	N-NTCIP	Yes
14	N-NTCIP	Yes
15	N-NTCIP	Yes
16	N-NTCIP	Yes
17	N-NTCIP	Yes
18	N-NTCIP	Yes
19	N-NTCIP	Yes
20	N-NTCIP	Yes
21	N-NTCIP	Yes
22	N-NTCIP	Yes
23	N-NTCIP	Yes
24	N-NTCIP	Yes
25	N-NTCIP	Yes
26	N-NTCIP	Yes
27	N-NTCIP	Yes
28	N-NTCIP	Yes
29	N-NTCIP	Yes
30	N-NTCIP	Yes
31	N-NTCIP	Yes
32	N-NTCIP	Yes
33	N-NTCIP	Yes
34	N-NTCIP	Yes
35	N-NTCIP	Yes
36	N-NTCIP	Yes
37	N-NTCIP	Yes
38	N-NTCIP	Yes
39	N-NTCIP	Yes
40	N-NTCIP	Yes
41	N-NTCIP	Yes
42	N-NTCIP	Yes
43	N-NTCIP	Yes
44	N-NTCIP	Yes
45	N-NTCIP	Yes
46	N-NTCIP	Yes
47	N-NTCIP	Yes
48	N-NTCIP	Yes
49	N-NTCIP	Yes
50	N-NTCIP	Yes
51	N-NTCIP	Yes
52	N-NTCIP	Yes
53	N-NTCIP	Yes
54	N-NTCIP	Yes
55	N-NTCIP	Yes
56	N-NTCIP	Yes
57	N-NTCIP	Yes
58	N-NTCIP	Yes
59	N-NTCIP	Yes

60	N-NTCIP	Yes
61	N-NTCIP	Yes
62	N-NTCIP	Yes
63	N-NTCIP	Yes
64	N-NTCIP	Yes

Vehicle Detector Plan Number - 1

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
1	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	3	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
5	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
9	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

Vehicle Detector Plan Number - 2

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
1	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	3	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
5	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	7	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
9	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

Vehicle Detector Plan Number - 3

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
1	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	3	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
5	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	7	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
9	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

Vehicle Detector Plan Number - 4

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
1	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	3	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
5	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	7	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
9	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

Ped Detector Phase Assignment (MM)
6-3

Mode: NTCIP

Called Phase	Detector
1	1
2	2

Called Phase	Detector
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16

Colorado Springs

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Detectors

Detectors - Pg 2

Log - Speed Detector Setup (MM) 6-4

NTCIP Log Period: 60	ECPI Log Period: 0	Length Unit: Inches

Speed Detector	Local Detector	One/Two Detector	Vehicle Length	Trap length	Enable Log
1	0	1	0	0	No
2	0	1	0	0	No
3	0	1	0	0	No
4	0	1	0	0	No
5	0	1	0	0	No
6	0	1	0	0	No
7	0	1	0	0	No
8	0	1	0	0	No
9	0	1	0	0	No
10	0	1	0	0	No
11	0	1	0	0	No
12	0	1	0	0	No
13	0	1	0	0	No
14	0	1	0	0	No
15	0	1	0	0	No
16	0	1	0	0	No

Vehicle Detector Diagnostics (MM) 6-5

Veh Diagnostic Plan Number - 1

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Veh Diagnostic Plan Number - 2

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Veh Diagnostic Plan Number - 3

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Veh Diagnostic Plan Number - 4

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Pedestrian Detector Diagnostics (MM) 6-6

Ped Diagnostic Plan Number - 1

Det	Counts	Act	Pres	Multiplier

Ped Diagnostic Plan Number - 2

Det	Counts	Act	Pres	Multiplier

Ped Diagnostic Plan Number - 3

Det	Counts	Act	Pres	Multiplier

Ped Diagnostic Plan Number - 4

Det	Counts	Act	Pres	Multiplier

Britannia Road and Fifth Line **Colorado Springs**

ECONOLITE

MOVING TRAFFIC FORWARD

ASC3 - 1 @ 2 - Econolite Type - ASC/3

Configuration Controller Sequence

Phase Ring Sequence and Assignment (MM) 1-1-1

Hardware Alternate Sequence Enable: No

Phase Ring Sequence.....(Note: Sequences identical to the prior one are not printed)

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	B		B		B		B		B							
Sequence 1																
Ring 1	1	2	3	4	9	10	13	14	.	.	.	.	.	.	.	.
Ring 2	5	6	7	8	11	12	15	16	.	.	.	.	.	.	.	.
Sequence 2																
Ring 1	2	1	3	4	10	9	13	14	.	.	.	.	.	.	.	.
Ring 2	5	6	7	8	11	12	15	16	.	.	.	.	.	.	.	.
Sequence 3																
Ring 1	1	2	4	3	9	10	14	13	.	.	.	.	.	.	.	.
Ring 2	5	6	7	8	11	12	15	16	.	.	.	.	.	.	.	.
Sequence 4																
Ring 1	2	1	4	3	10	9	14	13	.	.	.	.	.	.	.	.
Ring 2	5	6	7	8	11	12	15	16	.	.	.	.	.	.	.	.
Sequence 5																
Ring 1	1	2	3	4	9	10	13	14	.	.	.	.	.	.	.	.
Ring 2	6	5	7	8	12	11	15	16	.	.	.	.	.	.	.	.
Sequence 6																
Ring 1	2	1	3	4	10	9	13	14	.	.	.	.	.	.	.	.
Ring 2	6	5	7	8	12	11	15	16	.	.	.	.	.	.	.	.
Sequence 7																
Ring 1	1	2	4	3	9	10	14	13	.	.	.	.	.	.	.	.
Ring 2	6	5	7	8	12	11	15	16	.	.	.	.	.	.	.	.
Sequence 8																
Ring 1	2	1	4	3	10	9	14	13	.	.	.	.	.	.	.	.
Ring 2	6	5	7	8	12	11	15	16	.	.	.	.	.	.	.	.
Sequence 9																
Ring 1	1	2	3	4	9	10	13	14	.	.	.	.	.	.	.	.
Ring 2	5	6	8	7	11	12	16	15	.	.	.	.	.	.	.	.
Sequence 10																
Ring 1	2	1	3	4	10	9	13	14	.	.	.	.	.	.	.	.
Ring 2	5	6	8	7	11	12	16	15	.	.	.	.	.	.	.	.
Sequence 11																
Ring 1	1	2	4	3	9	10	14	13	.	.	.	.	.	.	.	.
Ring 2	5	6	8	7	11	12	16	15	.	.	.	.	.	.	.	.
Sequence 12																
Ring 1	2	1	4	3	10	9	14	13	.	.	.	.	.	.	.	.
Ring 2	5	6	8	7	11	12	16	15	.	.	.	.	.	.	.	.

Sequence 13															
Ring 1	1	2	3	4	9	10	13	14	.	.	.	.	.	.	.	.
Ring 2	6	5	8	7	12	11	16	15	.	.	.	.	.	.	.	.
Sequence 14															
Ring 1	2	1	3	4	10	9	13	14	.	.	.	.	.	.	.	.
Ring 2	6	5	8	7	12	11	16	15	.	.	.	.	.	.	.	.
Sequence 15															
Ring 1	1	2	4	3	9	10	14	13	.	.	.	.	.	.	.	.
Ring 2	6	5	8	7	12	11	16	15	.	.	.	.	.	.	.	.
Sequence 16															
Ring 1	2	1	4	3	10	9	14	13	.	.	.	.	.	.	.	.
Ring 2	6	5	8	7	12	11	16	15	.	.	.	.	.	.	.	.

Phases In Use/Exclusive Ped (MM) 1-2

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Phases In Use		X		X		X		X								
Exclusive Ped																

Phase Compatibility (MM) 1-1-2

Phase	
n/a	Barrier Mode

Phase and Overlap Descriptions

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description																
Overlap	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**P**
Description																

Administration (MM) 1-7-1

Enable Controller/Cabinet Interlock CRC	No
CRC (16 bit)	F272
Enable Automatic Backup to Datakey	No

Backup Prevent (MM) 1-1-3

Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Timing 1		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phases 2	X		.	.	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.		.	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	X		.	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.		.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	X		.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.		.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	X		.	.	.	.	.	.	.	.
9	.	.	.	.	.	.	.	.		.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.		.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.		.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.		.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.	.		.	.	.
14	.	.	.	.	.	.	.	.	.	.	.	.	.		.	.
15	.	.	.	.	.	.	.	.	.	.	.	.	.	.		.
16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	

Simultaneous Gap (MM) 1-1-4

Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2	.		.	.	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.		.	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.		.	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.		.	.	.	.	.	.	.	.	.	.	.
Phase 6	.	.	.	.	.		.	.	.	.	.	.	.	.	.	.
Must 7	.	.	.	.	.	.		.	.	.	.	.	.	.	.	.
Gap 8	.	.	.	.	.	.	.		.	.	.	.	.	.	.	.
With 9	.	.	.	.	.	.	.	.		.	.	.	.	.	.	.
Phase 10	.	.	.	.	.	.	.	.	.		.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.		.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.		.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.	.		.	.	.
14	.	.	.	.	.	.	.	.	.	.	.	.	.		.	.
15	.	.	.	.	.	.	.	.	.	.	.	.	.	.		.
16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
Disable	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Load Switch Assignments (MM) 1-3

	Phase / Overlap	Type	Dimming				Power Up	Auto		Flash Together
			Red	Yellow	Green	Dark		Red	Yellow	
1	1	V				-	Auto	X		
2	2	V				-	Auto	X		X
3	3	V				-	Auto	X		
4	4	V				-	Auto	X		X
5	5	V				+	Auto	X		
6	6	V				+	Auto	X		X
7	7	V				+	Auto	X		
8	8	V				+	Auto	X		X
9	2	P				-	Auto			

10	4	P				-	Auto			
11	6	P				+	Auto			
12	8	P				+	Auto			
13	1	O				-	Auto	X		
14	2	O				+	Auto	X		X
15	3	O				-	Auto	X		
16	4	O				+	Auto	X		X

Colorado Springs

ECONOLITE

MOVING TRAFFIC FORWARD

ASC3 - 1 @ 2 - Econolite Type - ASC/3

Configuration Port 1 (SDLC)

Port 1 SDLC (MM) 1-4-1

BIU	1	2	3	4	5	6	7	8
Term & Facility	X	X						
Detector Rack	X							

Enable TS2/MMU Type Cabinet: No
Enable MMU Extended Status: Yes
Enable SDLC Stop Time: No
Enable 3 Critical RFE's Lockup: Yes

MMU Program (MM) 1-4-2

Channel Can Serve With Channel	
Channel 1	**Channel 2**
1	5
1	6
1	11
2	5
2	6
2	9
2	11
3	7
3	8
3	12
4	7
4	8
4	10
4	12
5	9
6	9
6	11
7	10
8	10
8	12
9	11
10	12

Color Check Enable (MM) 1-4-3

Enable Color Check: Yes

MMU/LS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Green	X		X		X		X		X	X	X	X	X	X	X	X
Yellow	X		X		X		X		X	X	X	X	X	X	X	X
Red	X		X		X		X		X	X	X	X	X	X	X	X

Secondary Stations/Tests (MM) 1-4-4

ID	1	2	3	4	5	6	7	8	MMU
Term & Facility									

ID	1	2	3	4	5	6	7	8	Diag
Detector Rack									

Enable SDLC Diagnostic Test: No

Colorado Springs

ECONOLITE

MOVING TRAFFIC FORWARD

ASC3 - 1 @ 2 - Econolite Type - ASC/3

Configuration Communications 1 (SDLC)

Ethernet Port Configuration (MM) 1-5-1

Controller IP:	10.70.10.51
Subnet Mask:	255.255.255.0
Default Gateway IP:	10.70.10.1
Server IP:	10.70.10.1

NTCIP (MM) 1-5-5

NTCIP Backup Time (Sec):	0
NTCIP UDP Port:	501
Ethernet Priority:	1
Port 2 Priority (Port C50S for 2070):	4
Port 3A Priority (Port C21S for 2070):	2
Port 3B Priority (Port C22S for 2070):	3

Port Configuration (MM) 1-5-2 to 1-5-4

Port	2 (C50S)	3A (C21S)	3B (C22S)
Protocol	TERMINAL	NTCIP	ECPIP
Enable	No	No	No
Data Rate (BPS)	9600	19.2K	1200
Data, Parity, Stop	8 N 1	8 N 1	8 N 1
Address	0	0	0
Telemetry Response Delay	0.0	0.0	0.9
Duplex - Half or Full	Half	Full	Full
Flow Control	Yes	Yes	Yes
Group Address	0	0	0
Single Flag Enable	Yes	Yes	Yes
RTS to CTS Delay	n/a	n/a	14.0
RTS Turn Off Delay	n/a	n/a	2.0
Dropout Time	10	10	10
Early RTS	n/a	n/a	No
Telemetry Mode	n/a	n/a	FSK
ATCS Railroad	0	n/a	n/a
ATCS Railroad Line	0	n/a	n/a
ATCS Group	0	n/a	n/a
Wayside Device	0	n/a	n/a
ATC Device	0	n/a	n/a
Wayside Subnode	0	n/a	n/a
ATC Subnode	0	n/a	n/a

ECPIP (MM) 1-5-6

Controller Address:	0
Expanded System Detector Address:	0

System Detector Assignment

System Detector	Local Detector

Colorado Springs

ECONOLITE

MOVING TRAFFIC FORWARD

ASC3 - 1 @ 2 - Econolite Type - ASC/3

Configuration Logging / Display

Event Logging (MM) 1-6-1

Critical RFE's (MMU/TF)	Yes	3 Critical Errors Within 24 Hours	Yes
MMU Flash Faults	Yes	Local Flash Fault	Yes
Non-Critical RFE's (Det/Test)	Yes	Detector Errors	Yes
Coordination Errors	Yes	Controller Download	Yes
Preemption Events	Yes	TSP Events	Yes
Power On/Off	Yes	Low Battery	Yes
Access	Yes	Data Change	Yes
Online / Offline	Yes		

Alarm Event	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Enable Logging	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Display Options (MM) 1-7-2

Key Click Enable:	Yes
Backlight Enable:	Yes
LED Mode:	Auto
Display Mode:	Basic
Screen Format:	Advanced
Trans Mode Pop-Up Disable:	No

Sign On (MM) 8-5

Sign On Message Line 1: Solutions that Move the World
Sign On Message Line 2:

Software Modules (MM) 8-7

Application Version: 02.49.00
OS (Boot) Version: 01.12.05

Colorado Springs

ECONOLITE

MOVING TRAFFIC FORWARD

ASC3 - 1 @ 2 - Econolite Type - ASC/3

Logic Processor Page 1

Logic Statement Control (MM) 1-8-1

Logic #	Statement Control

Colorado Springs

ECONOLITE

MOVING TRAFFIC FORWARD

ASC3 - 1 @ 2 - Econolite Type - ASC/3

Logic Processor Page 2

Logic Statements (MM) 1-8-2

Colorado Springs

ECONOLITE

MOVING TRAFFIC FORWARD

ASC3 - 1 @ 2 - Econolite Type - ASC/3

Controller Timing Plan (MM) 2-1

Plan 1 EB SB WB NB

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction																
Min Green	0	25	0	10	0	25	0	10	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	15	0	0	0	15	0	0	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	25	0	16	0	25	0	16	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	5.0	4.0	5.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	0	65	0	25	0	65	0	25	35	35	35	35	35	35	35	35
Max2	0	55	0	25	0	55	0	25	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	4.0	3.0	4.0	3.0	4.0	3.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Plan 2

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction																
Min Green	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	16	0	16	0	16	0	16	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Max2	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Plan 3

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction																
Min Green	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	16	0	16	0	16	0	16	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Max2	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Plan 4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction																
Min Green	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	16	0	16	0	16	0	16	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Max2	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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MOVING TRAFFIC FORWARD

ASC3 - 1 @ 2 - Econolite Type - ASC/3

Controller Overlaps

Vehicle Overlaps (MM) 2-2

Overlap	Type	Lag Green	Yellow	Red	Adv. Green

Phases

Overlap	Phase	Included	Protect	Ped Protect	Not Overlap	Modifier	Lag X Phases	Lag 2 Phases	Flash Green

PPLT FYA

Overlap	Protected Phase (Left Turn)	Permissive Phase (Opposing Thru)	Flashing Arrow Output	Flashing Arrow Output CH	Delay Start of FYA	Delay Start of Clearance	Action Plan SF Bit Disable	Ped Protected Enable

Guaranteed Minimum Time Data (MM) 2-4

Phase	Min Green	Walk	Ped Clear	Yellow	Red Clear	Overlap Green
A01	5	0	7	3.0	0.0	5
B02	5	0	7	3.0	0.0	5
C03	5	0	7	3.0	0.0	5
D04	5	0	7	3.0	0.0	5
E05	5	0	7	3.0	0.0	5
F06	5	0	7	3.0	0.0	5
G07	5	0	7	3.0	0.0	5
H08	5	0	7	3.0	0.0	5
I09	5	0	7	3.0	0.0	5
J10	5	0	7	3.0	0.0	5
K11	5	0	7	3.0	0.0	5
L12	5	0	7	3.0	0.0	5
M13	5	0	7	3.0	0.0	5
N14	5	0	7	3.0	0.0	5
O15	5	0	7	3.0	0.0	5
P16	5	0	7	3.0	0.0	5

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ASC3 - 1 @ 2 - Econolite Type - ASC/3

Controller Pedestrian Overlaps
Vehicle / Pedestrian Overlaps (MM) 2-3

Included	Pedestrian Overlaps

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MOVING TRAFFIC FORWARD

ASC3 - 1 @ 2 - Econolite Type - ASC/3

Controller Start / Flash Data (MM) 2-5

Start Up

Phase	Phase Setting
1	.
2	Y
3	.
4	.
5	.
6	Y
7	.
8	.
9	.
10	.
11	.
12	.
13	.
14	.
15	.
16	.

Overlap

Flash Thru Mon: Yes
Flash Time: 0
All Red: 0
Power Start Seq: 1
MUTCD Enabled: No
Y->G: n/a

Automatic Flash

Entry
2
6

Exit
2
6

Overlap Exit
A
B

C
D

Flash Thru Mon:	Yes
Exit Flash:	W
Minimum Flash:	8
Mimimum Recall:	No
Cycle Through Phase:	No

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MOVING TRAFFIC FORWARD

ASC3 - 1 @ 2 - Econolite Type - ASC/3

Controller Options

Controller Options (MM) 2-6-1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Flashing Grn Ph	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Guar Passage																
Non-Act I		X				X										
Non-Act II				X				X								
Dual Entry		X		X		X		X								
Cond Service																
Cond Reservice																
Ped Re-Service																
Rest In Walk		X				X										
Flashing Walk																
Ped Clr-Yel																
Ped Clr-Red																
IGRN + Veh Ext																

Ped Clear Protect: Off Unit Red Revert: 2.0 MUTCD 3 Seconds Don't Walk: No

Pre-Timed Mode (MM) 2-7

Enable Pre-Timed Mode: No Free Input Disables Pre-Timed: No

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Pre-Timed																

Phase Recall Options (MM) 2-8

Plan # 1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Lock Detector																
Vehicle Recall		X				X										
Ped Recall		X				X										
Max Recall		X				X										
Soft Recall																
No Rest																
AI Calc																

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MOVING TRAFFIC FORWARD

ASC3 - 1 @ 2 - Econolite Type - ASC/3

Coordination Options

Options (MM) 3-1

Manual Pattern	Auto	ECPI Coord	Yes
System Source	TBC	System Format	STD
Splits In	Seconds	Offsets In	Seconds
Transition	Smooth	Max Select	MAXINH
Dwell / Add Time	0		
Delay Coord Wk-LZ	No	Force Off	Float
Offset Reference	Lead	Use Ped Time	Yes
Ped Recall	No	Ped Reservice	No
Local Zero Override	No	FO Added Ini Green	No
Re-sync Count	0	Multisync	No

Auto Perm Minimum Green (Seconds) (MM) 3-4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Split Demand (MM) 3-5

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Demand 1																
Demand 2																

Demand	1	2
Detector	0	0
Call Time (Sec)	0	0
Cycle Count	0	0

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ASC3 - 1 @ 2 - Econolite Type - ASC/3

Coordination Pattern Data
Coordinator Pattern Data (MM) 3-2

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ASC3 - 1 @ 2 - Econolite Type - ASC/3

Coordination Split Pattern
Split Pattern Data (MM) 3-3

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ASC3 - 1 @ 2 - Econolite Type - ASC/3

Preempt Plan

Preempt Plan (MM) 4-1

Preempt Plan 3

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Trk Clr Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Trk Clr Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Enable Trailing	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dwell Veh	.	X	.	.	.	X	.	.	.	.	.	.	.	.	.	.
Dwell Ped																
Dwell Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Ped																
Cycling Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Exit Phases				X				X								
Exit Calls																
Special Function																

Enable	Yes	Preempt Override	Yes	Interlock Enable	No
Det Lock	Yes	Delay	0	Inhibit	0
Override Flash	Yes	Duration	10	CLR > GRN	No
Term Ovlp Asap	No	PC Through Yel	No	Terminate Phase	Yes
Ped Dark	No	Track Clear Rsrv	No	Dwell Flash	Off
Linked Pmt	0	FL Exit Color	Grn	Exit Options	Off
Exit Timing Plan	0	Reservice	0	Fault Type	Hard

Ring	1	2	3	4
Free During Pmt	No	No	No	No

Timing	Walk	Ped Clr	Min Grn	Yellow	Red
Entrance	0	255	3	4.0	1.0
	Min Grn	Ext Grn	Max Grn	Yellow	Red
Track Clear	0	0	0	4.0	1.0
	Min Dwell	Pmt Ext	Max Time	Yellow	Red
Dwell / Cycle-Exit	0	0.0	0	4.0	1.0

Preemption Active Out	On	Preempt Act Dwell	No
Other - Priority Preempt	Off	Non-Priority Pmt	Off
Inhibit Extension Time	0.0	Ped Priority Return	Off
Veh Priority Return	Off	Queue Delay	Off
Conditional Delay	Off		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Pri Return %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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MOVING TRAFFIC FORWARD

ASC3 - 1 @ 2 - Econolite Type - ASC/3

Preempt Preempt Filtering
Enable Preempt Filtering & TSP/SCP (MM) 4-2

Input	Solid	Pulsing
1	...BYPASSED...	...BYPASSED...
2	...BYPASSED...	...BYPASSED...
3	PREEMPTION 3	PREEMPTION 7
4	PREEMPTION 4	PREEMPTION 8
5	PREEMPTION 5	PREEMPTION 9
6	PREEMPTION 6	PREEMPTION 10
7	...BYPASSED...	...BYPASSED...
8	...BYPASSED...	...BYPASSED...
9	...BYPASSED...	...BYPASSED...
10	...BYPASSED...	...BYPASSED...

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MOVING TRAFFIC FORWARD

ASC3 - 1 @ 2 - Econolite Type - ASC/3

Preempt TSP/SCP Plan and Split

TSP / SCP Plan (MM) 4-3

TSP/SCP Plan	Enable Option	Signal Type	Det Lock	Delay Time	Max Presence	PMT Enables Reservice	No Delay in TSP	Action SF Inhibit	Reservice Cycles	Bus Heading
1	No	Solid	No	0	0	No	False	0	0	NB
2	No	Solid	No	0	0	No	False	0	0	SB
3	No	Solid	No	0	0	No	False	0	0	EB
4	No	Solid	No	0	0	No	False	0	0	WB
5	No	Solid	No	0	0	No	False	0	0	.
6	No	Solid	No	0	0	No	False	0	0	.

Mode: TSP
Free Default Pattern: 120
Headway Allowance: 100

TSP/SCP Plan	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

TSP / SCP Split Pattern (MM) 4-4

TSP/SCP Split Pattern	Max Type	Phase															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
4	Max Reduction	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255

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MOVING TRAFFIC FORWARD

ASC3 - 1 @ 2 - Econolite Type - ASC/3

Time Base Clock/Calendar

Clock/Calendar Data (MM) 5-1

Manual Action Plan:	0
SYNC Reference Time:	00:00
SYNC Reference:	Reference Time
Day Light Savings:	USDLS
Time Reset Input Set Time:	3:30:00
Standard Time From GMT:	-5

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MOVING TRAFFIC FORWARD

ASC3 - 1 @ 2 - Econolite Type - ASC/3

Time Base Action Plan
Action Plan (MM) 5-2

Action Plan - 1

Pattern	Free	Override Sys	No
Timing Plan	0	Sequence	0
Veh Detector Plan	0	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	0	Ped Det Diag Plan	0
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall		X				X										
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall		X				X										
Max 2																
Max 3																
CS Inhibit																
Omit																

	1	2	3	4	5	6	7	8
Spec Func (1-8)								

	1	2	3
Aux Func (1-3)			

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.					

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MOVING TRAFFIC FORWARD

ASC3 - 1 @ 2 - Econolite Type - ASC/3

Time Base Day Plan/Schedule
Day Plan (MM) 5-3

Day Plan #1

Event	Action Plan	Start Time
1	1	06:30
2	2	09:30
3	1	15:00
4	2	19:00
5	2	00:01

Schedule (MM) 5-4

Schedule Number - 1

Day Plan No.: 1

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
	X	X	X	X	X	X	X

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**
	X	X	X	X	X	X	X	X	X	X	X
	23	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**		
	X	X	X	X	X	X	X	X	X		

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ECONOLITE

MOVING TRAFFIC FORWARD

ASC3 - 1 @ 2 - Econolite Type - ASC/3

Time Base Exceptions

Exception Day Program (MM) 5-5

Excep Day	Float/Fixed	Mon/Mon	DOW/DOM	WOM/Year	Day Plan

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MOVING TRAFFIC FORWARD

ASC3 - 1 @ 2 - Econolite Type - ASC/3

Detectors

Detectors - Pg 1

Veh Det Phase Assignment (MM) 6-1

Vehicle Detector Plan Number - 1

Veh Detector	Assigned Phase	Called Phase	Type
1	1		S
2	2	2	S
3	4	4	S
4	4	4	S
5	5		S
6	6	6	S
7	8	8	S
8	8	8	S
9	9		S
10	10		S
11	11		S
12	12		S
13	13		S
14	14		S
15	15		S
16	16		S

Vehicle Detector Plan Number - 2

Veh Detector	Assigned Phase	Called Phase	Type
1	1		S
2	2		S
3	3		S
4	4		S
5	5		S
6	6		S
7	7		S
8	8		S
9	9		S
10	10		S
11	11		S
12	12		S
13	13		S
14	14		S
15	15		S
16	16		S

Vehicle Detector Plan Number - 3

Veh Detector	Assigned Phase	Called Phase	Type
1	1		S
2	2		S
3	3		S
4	4		S
5	5		S
6	6		S
7	7		S
8	8		S
9	9		S
10	10		S
11	11		S
12	12		S
13	13		S
14	14		S
15	15		S
16	16		S

Vehicle Detector Plan Number - 4

Veh Detector	Assigned Phase	Called Phase	Type
1	1		S
2	2		S
3	3		S
4	4		S
5	5		S
6	6		S
7	7		S
8	8		S
9	9		S
10	10		S
11	11		S
12	12		S
13	13		S
14	14		S
15	15		S
16	16		S

Vehicle Detector Setup (MM) 6-2

Veh Detector	Type	TS2 Detector	Description
1	S-STANDARD	Yes	
2	S-STANDARD	Yes	
3	S-STANDARD	Yes	
4	S-STANDARD	Yes	
5	S-STANDARD	Yes	
6	S-STANDARD	Yes	
7	S-STANDARD	Yes	
8	S-STANDARD	Yes	
9	S-STANDARD	Yes	
10	S-STANDARD	Yes	
11	S-STANDARD	Yes	

12	S-STANDARD	Yes	
13	S-STANDARD	Yes	
14	S-STANDARD	Yes	
15	S-STANDARD	Yes	
16	S-STANDARD	Yes	

Vehicle Detector Plan Number - 1

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
1	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	4	No	Yes	10.0	Passage	0.0	0	No	0	None	No	No	No
4	4	No	Yes	10.0	Passage	0.0	0	No	0	None	No	No	No
5	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	8	No	Yes	10.0	Passage	0.0	0	No	0	None	No	No	No
8	8	No	Yes	10.0	Passage	0.0	0	No	0	None	No	No	No
9	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

Vehicle Detector Plan Number - 2

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
1	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	3	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
5	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	7	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
9	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

Vehicle Detector Plan Number - 3

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
1	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	3	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
5	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	7	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
9	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

Vehicle Detector Plan Number - 4

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
1	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	3	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
5	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	7	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
9	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

Ped Detector Phase Assignment (MM) 6-3

Mode: NTCIP

Called Phase	Detector
1	1
2	2
3	3

Called Phase	Detector
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16

Colorado Springs

ECONOLITE

MOVING TRAFFIC FORWARD

ASC3 - 1 @ 2 - Econolite Type - ASC/3

Detectors

Detectors - Pg 2

Log - Speed Detector Setup (MM) 6-4

NTCIP Log Period: 60 | ECPI Log Period: 0 | Length Unit: Inches

Speed Detector	Local Detector	One/Two Detector	Vehicle Length	Trap length	Enable Log
1	0	1	0	0	No
2	0	1	0	0	No
3	0	1	0	0	No
4	0	1	0	0	No
5	0	1	0	0	No
6	0	1	0	0	No
7	0	1	0	0	No
8	0	1	0	0	No
9	0	1	0	0	No
10	0	1	0	0	No
11	0	1	0	0	No
12	0	1	0	0	No
13	0	1	0	0	No
14	0	1	0	0	No
15	0	1	0	0	No
16	0	1	0	0	No

Vehicle Detector Diagnostics (MM) 6-5

Veh Diagnostic Plan Number - 1

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Veh Diagnostic Plan Number - 2

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Veh Diagnostic Plan Number - 3

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Veh Diagnostic Plan Number - 4

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Pedestrian Detector Diagnostics (MM) 6-6

Ped Diagnostic Plan Number - 1

Det	Counts	Act	Pres	Multiplier

Ped Diagnostic Plan Number - 2

Det	Counts	Act	Pres	Multiplier

Ped Diagnostic Plan Number - 3

Det	Counts	Act	Pres	Multiplier

Ped Diagnostic Plan Number - 4

Det	Counts	Act	Pres	Multiplier

Date: 1-Apr-2020
Intersection: Britannia Rd @ Sixth Line

8 Phase Basic Timing Sheet

	1	2	3	4	5	6	8	2 Ped	4 Ped	6 Ped	8 Ped
Phases in use		X		X	X	X	X		x	x	
Direction	WBLT	EB		SB	EBL	WB	NB				
Min Green	7	25		10	7	25	10				
Veh Ext.	2.5	5.0		5.0	2.5	5.0	5.0				
Yellow	3	4.6		4.2	3	4.6	4.2				
Red	1	2		2	1	2	2				
Walk		7			-	7					
Don't Walk		30			-	30					
Max 1	11	65		25	11	65	25				
Max 2	11	45		25	11	45	25				
Max 3											
Veh Recall											
Ped Recall											

Notes:

Britannia Road and Trafalgar Road 1

Date: 08-Oct-09
Intersection: Trafalgar Road & Britannia Road

8 Phase Basic Timing Sheet

	1	2	3	4	5	6	7	8	2 Ped	4 Ped	6 Ped	8 Ped
Phases in use	x	x	x	x	x	x		x				
Direction	SBLT	NB	WBLT	EB	NBLT	SB		WB				
Min Green	7	25	7	15	7	25		15				
Veh Ext.	-	5.0	-	5.0	-	5.0		5.0				
Yellow	3	5	3	4	3	5		4				
Red	1	2	1	2	1	2		2				
Walk	-	15	-	18	-	15		18				
Don't Walk	-	7	-	7	-	7		7				
Max 1	11	41	11	37	11	41		48				
Max 2	11	50	15	24	25	35		40				
Max 3	11	40	11	28	11	40		39				
Veh Recall												
Ped Recall												

Notes:
Use Max 1 during AM Peak (6:00am-9:00am)
Use Max 2 during PM Peak (3:00pm-7:00pm)
Use Max 3 during OFF Peak (9:00am-3:00pm, 7:00pm-6:00am)

Britannia Road and Trafalgar Road 2

Colorado Springs

ECONOLITE

MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Configuration Controller Sequence

Phase Ring Sequence and Assignment (MM) 1-1-1

Hardware Alternate Sequence Enable: No

Phase Ring Sequence.....(Note: Sequences identical to the prior one are not printed)

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	B		B		B		B		B							
Sequence 1																
Ring 1	1	2	3	4	9	10	13	14	.	.	.	.	.	.	.	.
Ring 2	5	6	7	8	11	12	15	16	.	.	.	.	.	.	.	.
Sequence 2																
Ring 1	2	1	3	4	10	9	13	14	.	.	.	.	.	.	.	.
Ring 2	5	6	7	8	11	12	15	16	.	.	.	.	.	.	.	.
Sequence 3																
Ring 1	1	2	4	3	9	10	14	13	.	.	.	.	.	.	.	.
Ring 2	5	6	7	8	11	12	15	16	.	.	.	.	.	.	.	.
Sequence 4																
Ring 1	2	1	4	3	10	9	14	13	.	.	.	.	.	.	.	.
Ring 2	5	6	7	8	11	12	15	16	.	.	.	.	.	.	.	.
Sequence 5																
Ring 1	1	2	3	4	9	10	13	14	.	.	.	.	.	.	.	.
Ring 2	6	5	7	8	12	11	15	16	.	.	.	.	.	.	.	.
Sequence 6																
Ring 1	2	1	3	4	10	9	13	14	.	.	.	.	.	.	.	.
Ring 2	6	5	7	8	12	11	15	16	.	.	.	.	.	.	.	.
Sequence 7																
Ring 1	1	2	4	3	9	10	14	13	.	.	.	.	.	.	.	.
Ring 2	6	5	7	8	12	11	15	16	.	.	.	.	.	.	.	.
Sequence 8																
Ring 1	2	1	4	3	10	9	14	13	.	.	.	.	.	.	.	.
Ring 2	6	5	7	8	12	11	15	16	.	.	.	.	.	.	.	.
Sequence 9																
Ring 1	1	2	3	4	9	10	13	14	.	.	.	.	.	.	.	.
Ring 2	5	6	8	7	11	12	16	15	.	.	.	.	.	.	.	.
Sequence 10																
Ring 1	2	1	3	4	10	9	13	14	.	.	.	.	.	.	.	.
Ring 2	5	6	8	7	11	12	16	15	.	.	.	.	.	.	.	.
Sequence 11																
Ring 1	1	2	4	3	9	10	14	13	.	.	.	.	.	.	.	.
Ring 2	5	6	8	7	11	12	16	15	.	.	.	.	.	.	.	.
Sequence 12																
Ring 1	2	1	4	3	10	9	14	13	.	.	.	.	.	.	.	.
Ring 2	5	6	8	7	11	12	16	15	.	.	.	.	.	.	.	.

Sequence 13															
Ring 1	**1**	**2**	**3**	**4**	**9**	**10**	**13**	**14**	.	.	.	.	.	.	.	.
Ring 2	**6**	**5**	**8**	**7**	**12**	**11**	**16**	**15**	.	.	.	.	.	.	.	.
Sequence 14															
Ring 1	**2**	**1**	**3**	**4**	**10**	**9**	**13**	**14**	.	.	.	.	.	.	.	.
Ring 2	**6**	**5**	**8**	**7**	**12**	**11**	**16**	**15**	.	.	.	.	.	.	.	.
Sequence 15															
Ring 1	**1**	**2**	**4**	**3**	**9**	**10**	**14**	**13**	.	.	.	.	.	.	.	.
Ring 2	**6**	**5**	**8**	**7**	**12**	**11**	**16**	**15**	.	.	.	.	.	.	.	.
Sequence 16															
Ring 1	**2**	**1**	**4**	**3**	**10**	**9**	**14**	**13**	.	.	.	.	.	.	.	.
Ring 2	**6**	**5**	**8**	**7**	**12**	**11**	**16**	**15**	.	.	.	.	.	.	.	.

Phases In Use/Exclusive Ped (MM) 1-2

Phase	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Phases In Use	X	X	X	X	X	X		X								
Exclusive Ped																

Phase Compatibility (MM) 1-1-2

Phase	
n/a	Barrier Mode

Phase and Overlap Descriptions

Phase	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Approach	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Movement																
Associated PED																
Overlap	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**P**
Approach	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Movement																

Administration (MM) 1-7-1

Enable Controller/Cabinet Interlock CRC	No
CRC (16 bit)	E581
Enable Automatic Backup to Datakey	No

Backup Prevent (MM) 1-1-3

	Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Timing	1		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phases	2	X		.	.	.	.	.	.	.	.	.	.	.	.	.	.
	3	.	.		.	.	.	.	.	.	.	.	.	.	.	.	.
	4	.	.	X		.	.	.	.	.	.	.	.	.	.	.	.
	5	.	.	.	.		.	.	.	.	.	.	.	.	.	.	.
	6	.	.	.	.	X		.	.	.	.	.	.	.	.	.	.
	7	.	.	.	.	.	.		.	.	.	.	.	.	.	.	.
	8	.	.	.	.	.	.	X		.	.	.	.	.	.	.	.
	9	.	.	.	.	.	.	.	.		.	.	.	.	.	.	.
	10	.	.	.	.	.	.	.	.	.		.	.	.	.	.	.
	11	.	.	.	.	.	.	.	.	.	.		.	.	.	.	.
	12	.	.	.	.	.	.	.	.	.	.	.		.	.	.	.
	13	.	.	.	.	.	.	.	.	.	.	.	.		.	.	.
	14	.	.	.	.	.	.	.	.	.	.	.	.	.		.	.
	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.		.
	16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	

Simultaneous Gap (MM) 1-1-4

	Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	1		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	2	.		.	.	.	.	.	.	.	.	.	.	.	.	.	.
	3	.	.		.	.	.	.	.	.	.	.	.	.	.	.	.
	4	.	.	.		.	.	.	.	.	.	.	.	.	.	.	.
	5	.	.	.	.		.	.	.	.	.	.	.	.	.	.	.
Phase	6	.	.	.	.	.		.	.	.	.	.	.	.	.	.	.
Must	7	.	.	.	.	.	.		.	.	.	.	.	.	.	.	.
Gap	8	.	.	.	.	.	.	.		.	.	.	.	.	.	.	.
With	9	.	.	.	.	.	.	.	.		.	.	.	.	.	.	.
Phase	10	.	.	.	.	.	.	.	.	.		.	.	.	.	.	.
	11	.	.	.	.	.	.	.	.	.	.		.	.	.	.	.
	12	.	.	.	.	.	.	.	.	.	.	.		.	.	.	.
	13	.	.	.	.	.	.	.	.	.	.	.	.		.	.	.
	14	.	.	.	.	.	.	.	.	.	.	.	.	.		.	.
	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.		.
	16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
	Disable	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Load Switch Assignments (MM) 1-3

	Phase / Overlap	Type	Dimming				Power Up	Auto		Flash Together
			Red	Yellow	Green	Dark		Red	Yellow	
1	1	V				-	Auto	X		
2	2	V				-	Auto	X		X
3	3	V				-	Auto	X		
4	4	V				-	Auto	X		X
5	5	V				+	Auto	X		
6	6	V				+	Auto	X		X
7	7	V				+	Auto	X		
8	8	V				+	Auto	X		X
9	2	P				-	Auto			

10	4	P				-	Auto			
11	6	P				+	Auto			
12	8	P				+	Auto			
13	1	O				-	Auto	X		
14	2	O				+	Auto	X		X
15	3	O				-	Auto	X		
16	4	O				+	Auto	X		X

Colorado Springs

ECONOLITE

MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Configuration Port 1 (SDLC)

Port 1 SDLC (MM) 1-4-1

BIU	1	2	3	4	5	6	7	8
Term & Facility	X	X						
Detector Rack	X							

Enable TS2/MMU Type Cabinet: No
Enable MMU Extended Status: No
Enable SDLC Stop Time: No
Enable 3 Critical RFE's Lockup: Yes

MMU Program (MM) 1-4-2

Channel Can Serve With Channel	
Channel 1	**Channel 2**

Color Check Enable (MM) 1-4-3

Enable Color Check: No

MMU/LS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Green																
Yellow																
Red																

Secondary Stations/Tests (MM) 1-4-4

ID	1	2	3	4	5	6	7	8	MMU
Term & Facility									

ID	1	2	3	4	5	6	7	8	Diag
Detector Rack									

Enable SDLC Diagnostic Test: No

Colorado Springs

ECONOLITE

MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Configuration Communications 1 (SDLC)

Ethernet Port Configuration (MM) 1-5-1

DHCP Enable:	No
Controller IP:	10.70.10.51
Subnet Mask:	255.255.255.0
Default Gateway IP:	10.70.10.1
Server IP:	10.70.10.1

NTCIP (MM) 1-5-5

NTCIP Backup Time (Sec):	0
NTCIP UDP Port:	501
Ethernet Priority:	1
Port 2 Priority (Port C50S for 2070):	4
Port 3A Priority (Port C21S for 2070):	2
Port 3B Priority (Port C22S for 2070):	3

Port Configuration (MM) 1-5-2 to 1-5-4

Port	2 (C50S)	3A (C21S)	3B (C22S)
Comm Module	None	Auto	Auto
Protocol	TERMINAL	NTCIP	ECPIP
Enable	No	No	No
Data Rate (BPS)	9600	19.2K	1200
Data, Parity, Stop	8 N 1	8 N 1	8 N 1
Address	0	0	0
Telemetry Response Delay	0.0	0.0	0.9
Duplex - Half or Full	Half	Full	Full
Flow Control	Yes	Yes	Yes
Group Address	0	0	0
Single Flag Enable	Yes	Yes	Yes
RTS to CTS Delay	n/a	n/a	14.0
RTS Turn Off Delay	n/a	n/a	2.0
Dropout Time	10	10	10
Early RTS	n/a	n/a	No
Telemetry Mode	n/a	n/a	FSK
ATCS Railroad	0	n/a	n/a
ATCS Railroad Line	0	n/a	n/a
ATCS Group	0	n/a	n/a
Wayside Device	0	n/a	n/a
ATC Device	0	n/a	n/a
Wayside Subnode	0	n/a	n/a
ATC Subnode	0	n/a	n/a

ECPIP (MM) 1-5-6

Controller Address:	0
Expanded System Detector Address:	0

System Detector Assignment

System Detector	Local Detector

Wireless Configuration (MM) 1-5-7

Wireless Channel Number: 6
Wireless Access Code: 327723274

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MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Configuration Logging / Display

Event Logging (MM) 1-6-1

Critical RFE's (MMU/TF)	Yes	3 Critical Errors Within 24 Hours	Yes
MMU Flash Faults	Yes	Local Flash Fault	Yes
Non-Critical RFE's (Det/Test)	Yes	Detector Errors	Yes
Coordination Errors	Yes	Controller Download	Yes
Preemption Events	Yes	TSP Events	Yes
Power On/Off	Yes	Low Battery	Yes
Access	Yes	Data Change	Yes
Online / Offline	Yes		

Alarm Event	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Enable Logging	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Display Options (MM) 1-7-2

Key Click Enable:	No
Switch to Graphics Mode:	No
LED Mode:	Auto
Display Mode:	Basic
Trans Mode Pop-Up Disable:	No

Sign On (MM) 8-5

Sign On Message Line 1: Dual Walk Term & Call Next Thru
Sign On Message Line 2:

Software Modules (MM) 8-7

Application Version: 32.66.10
OS (Boot) Version: 06.07.00

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Cobalt - 1 @ 2 - Econolite Type - Cobalt

Logic Processor Page 1

Logic Statement Control (MM) 1-8-1

Logic #	Statement Control

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MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Logic Processor Page 2

Logic Statements (MM) 1-8-2

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MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Controller Timing Plan (MM) 2-1

Plan 1 - "" SBL NB WBL EB NBL SB WB

	Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Direction	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
	Min Green	7	25	7	15	7	25	0	15	5	5	5	5	5	5	5	5
	Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Walk	0	7	0	7	0	7	0	7	0	10	0	10	0	10	0	10
	Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Ped Clear	0	30	0	33	0	15	0	18	0	16	0	16	0	16	0	16
	Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Vehicle Ext	3.0	5.0	3.0	5.0	3.0	5.0	3.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AM	Max1	15	41	11	37	11	41	0	48	35	35	35	35	35	35	35	35
PM	Max2	11	50	15	40	25	50	40	40	40	40	40	40	40	40	40	40
	Max3	11	40	11	28	11	40	0	39	0	0	0	0	0	0	0	0
	DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Yellow	3.0	5.0	3.0	4.0	3.0	5.0	3.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
	Red Clear	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Plan 2 - ""

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Min Green	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	16	0	16	0	16	0	16	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Max2	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Plan 3 - ""

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Min Green	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	16	0	16	0	16	0	16	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Max2	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Plan 4 - ""

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Min Green	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	16	0	16	0	16	0	16	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Max2	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Colorado Springs

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MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Controller Overlaps

Vehicle Overlaps (MM) 2-2

Overlap	Type	Lag Green	Yellow	Red	Adv. Green

Phases

Overlap	Phase	Included	Protect	Ped Protect	Not Overlap	Modifier	Lag X Phases	Lag 2 Phases	Flash Green

PPLT FYA

Overlap	Protected Phase (Left Turn)	Permissive Phase (Opposing Thru)	Flashing Arrow Output	Flashing Arrow Output CH	Delay Start of FYA	Delay Start of Clearance	Action Plan SF Bit Disable	Ped Protected Enable

Guaranteed Minimum Time Data (MM) 2-4

Phase	Min Green	Walk	Ped Clear	Yellow	Red Clear	Overlap Green
A01	5	0	7	3.0	0.0	5
B02	5	0	7	3.0	0.0	5
C03	5	0	7	3.0	0.0	5
D04	5	0	7	3.0	0.0	5
E05	5	0	7	3.0	0.0	5
F06	5	0	7	3.0	0.0	5
G07	5	0	7	3.0	0.0	5
H08	5	0	7	3.0	0.0	5
I09	5	0	7	3.0	0.0	5
J10	5	0	7	3.0	0.0	5
K11	5	0	7	3.0	0.0	5
L12	5	0	7	3.0	0.0	5
M13	5	0	7	3.0	0.0	5
N14	5	0	7	3.0	0.0	5
O15	5	0	7	3.0	0.0	5
P16	5	0	7	3.0	0.0	5

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MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Controller Pedestrian Overlaps
Vehicle / Pedestrian Overlaps (MM) 2-3

Included	Pedestrian Overlaps

Colorado Springs

ECONOLITE

MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Controller Start / Flash Data (MM) 2-5

Start Up

Phase	Phase Setting
1	.
2	R
3	.
4	.
5	.
6	R
7	.
8	.
9	.
10	.
11	.
12	.
13	.
14	.
15	.
16	.

Overlap
A
B
C
D

Flash Thru Mon: No
Flash Time: 0
All Red: 7
Power Start Seq: 1
MUTCD Enabled: No
Y->G: n/a

Automatic Flash

Entry
2
6

Exit
2
6

Overlap Exit
A
B
C
D

Flash Thru Mon:	No
Exit Flash:	W
Minimum Flash:	8
Mimimum Recall:	No
Cycle Through Phase:	No

Colorado Springs

ECONOLITE

MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Controller Options

Controller Options (MM) 2-6-1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Flashing Grn Ph	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Guar Passage																
Non-Act I		X				X										
Non-Act II																
Dual Entry		X		X		X		X								
Cond Service																
Cond Reservice																
Ped Re-Service																
Rest In Walk																
Flashing Walk																
Ped Clr-Yel																
Ped Clr-Red																
IGRN + Veh Ext																

Ped Clear Protect: Off Unit Red Revert: 2.0 MUTCD 3 Seconds Don't Walk: No

Pre-Timed Mode (MM) 2-7

Enable Pre-Timed Mode: No Free Input Disables Pre-Timed: No

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Pre-Timed																

Phase Recall Options (MM) 2-8

Plan # 1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Lock Detector									X	X	X	X	X	X	X	X
Vehicle Recall		X				X										
Ped Recall		X				X										
Max Recall																
Soft Recall																
No Rest																
AI Calc																

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ECONOLITE

MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Coordination Options

Options (MM) 3-1

Manual Pattern	Auto	ECPI Coord	Yes
System Source	TBC	System Format	STD
Splits In	Percent	Offsets In	Percent
Transition	Smooth	Max Select	MAXINH
Dwell / Add Time	0		
Delay Coord Wk-LZ	No	Force Off	Float
Offset Reference	Lead	Use Ped Time	Yes
Ped Recall	No	Ped Reservice	No
Local Zero Override	Yes	FO Added Ini Green	No
Re-sync Count	0	Multisync	No

Auto Perm Minimum Green (Seconds) (MM) 3-4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Split Demand (MM) 3-5

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Demand 1																
Demand 2																

Demand	1	2
Detector	0	0
Call Time (Sec)	0	0
Cycle Count	0	0

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ECONOLITE

MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Coordination Pattern Data
Coordinator Pattern Data (MM) 3-2

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MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Coordination Split Pattern
Split Pattern Data (MM) 3-3

Split Pattern # 1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Split (percent)	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0
Coord Phase																
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	0%	9%	0%	0%

Split Pattern # 2

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Split (percent)	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0
Coord Phase																
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	0%	10%	0%	0%

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ECONOLITE

MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Preempt Plan

Preempt Plan (MM) 4-1

Preempt Plan 3

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Trk Clr Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Trk Clr Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Enable Trailing	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dwell Veh	.	X	.	.	.	X	.	.	.	.	.	.	.	.	.	.
Dwell Ped																
Dwell Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Ped																
Cycling Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Exit Phases				X				X								
Exit Calls																
Special Function																

Enable	Yes	Preempt Override	Yes	Interlock Enable	No
Det Lock	Yes	Delay	0	Inhibit	0
Override Flash	No	Duration	10	CLR > GRN	No
Term Ovlp Asap	No	PC Through Yel	No	Terminate Phase	No
Ped Dark	No	Track Clear Rsrv	No	Dwell Flash	Off
Linked Pmt	0	FL Exit Color	Grn	Exit Options	Off
Exit Timing Plan	0	Reservice	0	Fault Type	Hard

Ring	1	2	3	4
Free During Pmt	No	No	No	No

Timing	Walk	Ped Clr	Min Grn	Yellow	Red
Entrance	0	5	5	4.0	1.0
	Min Grn	Ext Grn	Max Grn	Yellow	Red
Track Clear	0	0	0	4.0	1.0
	Min Dwell	Pmt Ext	Max Time	Yellow	Red
Dwell / Cycle-Exit	0	0.0	0	4.0	1.0

Preemption Active Out	On	Preempt Act Dwell	No
Other - Priority Preempt	Off	Non-Priority Pmt	Off
Inhibit Extension Time	0.0	Ped Priority Return	Off
Veh Priority Return	Off	Queue Delay	Off
Conditional Delay	Off		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Pri Return %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Preempt Plan 4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Overlap	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Trk Clr Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Trk Clr Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Enable Trailing	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Dwell Veh	.	.	.	X	.	.	.	X	.	.	.	.	.	.	.	.
Dwell Ped																
Dwell Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Veh	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Cycling Ped																
Cycling Overlap	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Exit Phases		X				X										
Exit Calls																
Special Function																

Enable	Yes	Preempt Override	Yes	Interlock Enable	No
Det Lock	Yes	Delay	0	Inhibit	0
Override Flash	No	Duration	10	CLR > GRN	No
Term Ovlp Asap	No	PC Through Yel	No	Terminate Phase	No
Ped Dark	No	Track Clear Rsrv	No	Dwell Flash	Off
Linked Pmt	0	FL Exit Color	Grn	Exit Options	Off
Exit Timing Plan	0	Reservice	0	Fault Type	Hard

Ring	1	2	3	4
Free During Pmt	No	No	No	No

Timing	Walk	Ped Clr	Min Grn	Yellow	Red
Entrance	0	5	5	4.0	1.0
	Min Grn	**Ext Grn**	**Max Grn**	**Yellow**	**Red**
Track Clear	0	0	0	4.0	1.0
	Min Dwell	**Pmt Ext**	**Max Time**	**Yellow**	**Red**

Dwell / Cycle-Exit	0	0.0	0	4.0	1.0

Preemption Active Out	On	Preempt Act Dwell	No
Other - Priority Preempt	Off	Non-Priority Pmt	Off
Inhibit Extension Time	0.0	Ped Priority Return	Off
Veh Priority Return	Off	Queue Delay	Off
Conditional Delay	Off		

Phase	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Veh Pri Return %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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ECONOLITE

MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Preempt Preempt Filtering
Enable Preempt Filtering &
TSP/SCP (MM) 4-2

Input	Solid	Pulsing
1	...BYPASSED...	...BYPASSED...
2	...BYPASSED...	...BYPASSED...
3	PREEMPTION 3	PREEMPTION 7
4	PREEMPTION 4	PREEMPTION 8
5	PREEMPTION 5	PREEMPTION 9
6	PREEMPTION 6	PREEMPTION 10
7	...BYPASSED...	...BYPASSED...
8	...BYPASSED...	...BYPASSED...
9	...BYPASSED...	...BYPASSED...
10	...BYPASSED...	...BYPASSED...

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MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Preempt TSP/SCP Plan and Split

TSP / SCP Plan (MM) 4-3

TSP/SCP Plan	Enable Option	Signal Type	Det Lock	Delay Time	Max Presence	PMT Enables Reservice	No Delay in TSP	Action SF Inhibit	Reservice Cycles	Bus Heading
1	No	Solid	No	0	0	No	False	0	0	NB
2	No	Solid	No	0	0	No	False	0	0	SB
3	No	Solid	No	0	0	No	False	0	0	EB
4	No	Solid	No	0	0	No	False	0	0	WB
5	No	Solid	No	0	0	No	False	0	0	.
6	No	Solid	No	0	0	No	False	0	0	.

Mode: TSP
Free Default Pattern: 120
Headway Allowance: 100

TSP/SCP Plan	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

TSP / SCP Split Pattern (MM) 4-4

TSP/SCP Split Pattern	Max Type	Phase															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
4	Max Reduction	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255

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MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Time Base Clock/Calendar

Clock/Calendar Data (MM) 5-1

Manual Action Plan:	0
SYNC Reference Time:	03:15
SYNC Reference:	Reference Time
Day Light Savings:	USDLS
Time Reset Input Set Time:	3:30:00
Standard Time From GMT:	-5

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MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Time Base Action Plan
Action Plan (MM) 5-2

Action Plan - 1 - "1"

Pattern	1	Override Sys	No
Timing Plan	1	Sequence	0
Veh Detector Plan	0	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	0	Ped Det Diag Plan	0
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)								

Aux Func (1-3)			

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.					

Action Plan - 2 - "2"

Pattern	2	Override Sys	No
Timing Plan	1	Sequence	0
Veh Detector Plan	0	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	0	Ped Det Diag Plan	0
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2	X	X	X	X	X	X		X								
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)								

Aux Func (1-3)			

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.					

Action Plan - 3 - "3"

Pattern	3	Override Sys	No
Timing Plan	1	Sequence	0
Veh Detector Plan	0	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	0	Ped Det Diag Plan	0
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3	X	X	X	X	X	X		X								
CS Inhibit																
Omit																

Spec Func (1-8)								

Aux Func (1-3)			

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.					

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ECONOLITE

MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Time Base Day Plan/Schedule
Day Plan (MM) 5-3

Day Plan #1 - "1"

Event	Action Plan	Start Time
1	1	06:00
2	2	15:00
3	3	09:00
4	1	19:00

Day Plan #2 - "2"

Event	Action Plan	Start Time
1	4	07:00
2	5	19:00

Schedule (MM) 5-4

Schedule Number - 1

Day Plan No.: 1

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
		X	X	X	X	X	

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**
	X	X	X	X	X	X	X	X	X	X	X
	23	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**		
	X	X	X	X	X	X	X	X	X		

Schedule Number - 2

Day Plan No.: 2

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
	X						X

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**
	X	X	X	X	X	X	X	X	X	X	X
	23	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**		
	X	X	X	X	X	X	X	X	X		

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MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Time Base Exceptions

Exception Day Program (MM) 5-5

Excep Day	Float/Fixed	Mon/Mon	DOW/DOM	WOM/Year	Day Plan

Colorado Springs

ECONOLITE

MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Detectors

Detectors - Pg 1

Veh Det Phase Assignment (MM) 6-1

Vehicle Detector Plan Number - 1

Veh Detector	Assigned Phase	Called Phase	Type
1	1		N
2	2		N
3	4		N
4	4		N
5	5		N
6	6		N
7	8		N
8	8		N
9	9		N
10	10		N
11	4		N
12	3		N
13	13		N
14	14		N
15	15		N
16	16		N

Vehicle Detector Plan Number - 2

Veh Detector	Assigned Phase	Called Phase	Type
1	1		N
2	2		N
3	3		N
4	4		N
5	5		N
6	6		N
7	7		N
8	8		N
9	9		N
10	10		N
11	11		N
12	12		N
13	13		N
14	14		N
15	15		N
16	16		N

Vehicle Detector Plan Number - 3

Veh Detector	Assigned Phase	Called Phase	Type
1	1		N
2	2		N
3	3		N
4	4		N
5	5		N
6	6		N
7	7		N
8	8		N
9	9		N
10	10		N
11	11		N
12	12		N
13	13		N
14	14		N
15	15		N
16	16		N

Vehicle Detector Plan Number - 4

Veh Detector	Assigned Phase	Called Phase	Type
1	1		N
2	2		N
3	3		N
4	4		N
5	5		N
6	6		N
7	7		N
8	8		N
9	9		N
10	10		N
11	11		N
12	12		N
13	13		N
14	14		N
15	15		N
16	16		N

Vehicle Detector Setup (MM) 6-2

Veh Detector	Type	TS2 Detector	Description
1	N-NTCIP	Yes	
2	N-NTCIP	Yes	
3	N-NTCIP	Yes	
4	N-NTCIP	Yes	
5	N-NTCIP	Yes	
6	N-NTCIP	Yes	
7	N-NTCIP	Yes	
8	N-NTCIP	Yes	
9	N-NTCIP	Yes	
10	N-NTCIP	Yes	
11	N-NTCIP	Yes	

12	N-NTCIP	Yes	
13	N-NTCIP	Yes	
14	N-NTCIP	Yes	
15	N-NTCIP	Yes	
16	N-NTCIP	Yes	
17	N-NTCIP	Yes	
18	N-NTCIP	Yes	
19	N-NTCIP	Yes	
20	N-NTCIP	Yes	
21	N-NTCIP	Yes	
22	N-NTCIP	Yes	
23	N-NTCIP	Yes	
24	N-NTCIP	Yes	
25	N-NTCIP	Yes	
26	N-NTCIP	Yes	
27	N-NTCIP	Yes	
28	N-NTCIP	Yes	
29	N-NTCIP	Yes	
30	N-NTCIP	Yes	
31	N-NTCIP	Yes	
32	N-NTCIP	Yes	
33	N-NTCIP	Yes	
34	N-NTCIP	Yes	
35	N-NTCIP	Yes	
36	N-NTCIP	Yes	
37	N-NTCIP	Yes	
38	N-NTCIP	Yes	
39	N-NTCIP	Yes	
40	N-NTCIP	Yes	
41	N-NTCIP	Yes	
42	N-NTCIP	Yes	
43	N-NTCIP	Yes	
44	N-NTCIP	Yes	
45	N-NTCIP	Yes	
46	N-NTCIP	Yes	
47	N-NTCIP	Yes	
48	N-NTCIP	Yes	
49	N-NTCIP	Yes	
50	N-NTCIP	Yes	
51	N-NTCIP	Yes	
52	N-NTCIP	Yes	
53	N-NTCIP	Yes	
54	N-NTCIP	Yes	
55	N-NTCIP	Yes	
56	N-NTCIP	Yes	
57	N-NTCIP	Yes	
58	N-NTCIP	Yes	
59	N-NTCIP	Yes	
60	N-NTCIP	Yes	
61	N-NTCIP	Yes	
62	N-NTCIP	Yes	

63	N-NTCIP	Yes	
64	N-NTCIP	Yes	

Vehicle Detector Plan Number - 1

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
1	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
5	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
9	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	3	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

Vehicle Detector Plan Number - 2

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
1	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	3	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
5	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	7	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
9	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

Vehicle Detector Plan Number - 3

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time /	Queue Lim. /	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay

						Passage Time	Discon. Time						
1	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	3	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
5	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	7	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
9	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

Vehicle Detector Plan Number - 4

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
1	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	3	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
5	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	7	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
9	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

Ped Detector Phase Assignment (MM) 6-3

Mode: NTCIP

Called Phase	Detector
1	1
2	2
3	3
4	4
5	5

Called Phase	Detector
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16

Colorado Springs

ECONOLITE

MOVING TRAFFIC FORWARD

Cobalt - 1 @ 2 - Econolite Type - Cobalt

Detectors

Detectors - Pg 2

Log - Speed Detector Setup (MM) 6-4

NTCIP Log Period: 60 | ECPI Log Period: 0 | Length Unit: Inches

Speed Detector	Local Detector	One/Two Detector	Vehicle Length	Trap length	Enable Log
1	0	1	0	0	No
2	0	1	0	0	No
3	0	1	0	0	No
4	0	1	0	0	No
5	0	1	0	0	No
6	0	1	0	0	No
7	0	1	0	0	No
8	0	1	0	0	No
9	0	1	0	0	No
10	0	1	0	0	No
11	0	1	0	0	No
12	0	1	0	0	No
13	0	1	0	0	No
14	0	1	0	0	No
15	0	1	0	0	No
16	0	1	0	0	No

Vehicle Detector Diagnostics (MM) 6-5

Veh Diagnostic Plan Number - 1

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Veh Diagnostic Plan Number - 2

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Veh Diagnostic Plan Number - 3

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Veh Diagnostic Plan Number - 4

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Pedestrian Detector Diagnostics (MM) 6-6

Ped Diagnostic Plan Number - 1

Det	Counts	Act	Pres	Multiplier

Ped Diagnostic Plan Number - 2

Det	Counts	Act	Pres	Multiplier

Ped Diagnostic Plan Number - 3

Det	Counts	Act	Pres	Multiplier

Ped Diagnostic Plan Number - 4

Det	Counts	Act	Pres	Multiplier

Labeled as James Snow Parkway and Louis St. Laurent

Colorado Springs

ECONOLITE

MOVING TRAFFIC FORWARD

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Configuration Controller Sequence

Phase Ring Sequence and Assignment (MM) 1-1-1

Hardware Alternate Sequence Enable: Yes

Phase Ring Sequence.....(Note: Sequences identical to the prior one are not printed)

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
	B		B		B		B		B							
Sequence 1																
Ring 1	1	2	3	4	9	10	13	14	.	.	.	.	.	.	.	.
Ring 2	5	6	7	8	11	12	15	16	.	.	.	.	.	.	.	.
Sequence 2																
Ring 1	2	1	3	4	10	9	13	14	.	.	.	.	.	.	.	.
Ring 2	5	6	7	8	11	12	15	16	.	.	.	.	.	.	.	.
Sequence 3																
Ring 1	1	2	4	3	9	10	14	13	.	.	.	.	.	.	.	.
Ring 2	5	6	7	8	11	12	15	16	.	.	.	.	.	.	.	.
Sequence 4																
Ring 1	2	1	4	3	10	9	14	13	.	.	.	.	.	.	.	.
Ring 2	5	6	7	8	11	12	15	16	.	.	.	.	.	.	.	.
Sequence 5																
Ring 1	1	2	3	4	9	10	13	14	.	.	.	.	.	.	.	.
Ring 2	6	5	7	8	12	11	15	16	.	.	.	.	.	.	.	.
Sequence 6																
Ring 1	2	1	3	4	10	9	13	14	.	.	.	.	.	.	.	.
Ring 2	6	5	7	8	12	11	15	16	.	.	.	.	.	.	.	.
Sequence 7																
Ring 1	1	2	4	3	9	10	14	13	.	.	.	.	.	.	.	.
Ring 2	6	5	7	8	12	11	15	16	.	.	.	.	.	.	.	.
Sequence 8																
Ring 1	2	1	4	3	10	9	14	13	.	.	.	.	.	.	.	.
Ring 2	6	5	7	8	12	11	15	16	.	.	.	.	.	.	.	.
Sequence 9																
Ring 1	1	2	3	4	9	10	13	14	.	.	.	.	.	.	.	.
Ring 2	5	6	8	7	11	12	16	15	.	.	.	.	.	.	.	.
Sequence 10																
Ring 1	2	1	3	4	10	9	13	14	.	.	.	.	.	.	.	.
Ring 2	5	6	8	7	11	12	16	15	.	.	.	.	.	.	.	.
Sequence 11																
Ring 1	1	2	4	3	9	10	14	13	.	.	.	.	.	.	.	.
Ring 2	5	6	8	7	11	12	16	15	.	.	.	.	.	.	.	.
Sequence 12																
Ring 1	2	1	4	3	10	9	14	13	.	.	.	.	.	.	.	.
Ring 2	5	6	8	7	11	12	16	15	.	.	.	.	.	.	.	.

Sequence 13																
Ring 1	1	2	3	4	9	10	13	14	.	.	.	.	.	.	.	.
Ring 2	6	5	8	7	12	11	16	15	.	.	.	.	.	.	.	.
Sequence 14																
Ring 1	2	1	3	4	10	9	13	14	.	.	.	.	.	.	.	.
Ring 2	6	5	8	7	12	11	16	15	.	.	.	.	.	.	.	.
Sequence 15																
Ring 1	1	2	4	3	9	10	14	13	.	.	.	.	.	.	.	.
Ring 2	6	5	8	7	12	11	16	15	.	.	.	.	.	.	.	.
Sequence 16																
Ring 1	2	1	4	3	10	9	14	13	.	.	.	.	.	.	.	.
Ring 2	6	5	8	7	12	11	16	15	.	.	.	.	.	.	.	.

Phases In Use/Exclusive Ped (MM) 1-2

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Phases In Use		X		X		X										
Exclusive Ped																

Phase Compatibility (MM) 1-1-2

Phase	
n/a	Barrier Mode

Phase and Overlap Descriptions

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Approach	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Movement																
Associated PED																
Overlap	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**P**
Approach	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Movement																

Administration (MM) 1-7-1

Enable Controller/Cabinet Interlock CRC	No
CRC (16 bit)	744F
Enable Automatic Backup to Datakey	No

Backup Prevent (MM) 1-1-3

Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Timing 1		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Phases 2	X		.	.	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.		.	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	X		.	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.		.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	X		.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.		.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	X		.	.	.	.	.	.	.	.
9	.	.	.	.	.	.	.	.		.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.		.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.		.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.		.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.	.		.	.	.
14	.	.	.	.	.	.	.	.	.	.	.	.	.		.	.
15	.	.	.	.	.	.	.	.	.	.	.	.	.	.		.
16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	

Simultaneous Gap (MM) 1-1-4

Phases	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2	.		.	.	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.		.	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.		.	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.		.	.	.	.	.	.	.	.	.	.	.
Phase 6	.	.	.	.	.		.	.	.	.	.	.	.	.	.	.
Must 7	.	.	.	.	.	.		.	.	.	.	.	.	.	.	.
Gap 8	.	.	.	.	.	.	.		.	.	.	.	.	.	.	.
With 9	.	.	.	.	.	.	.	.		.	.	.	.	.	.	.
Phase 10	.	.	.	.	.	.	.	.	.		.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.		.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.		.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.	.		.	.	.
14	.	.	.	.	.	.	.	.	.	.	.	.	.		.	.
15	.	.	.	.	.	.	.	.	.	.	.	.	.	.		.
16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
Disable	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Load Switch Assignments (MM) 1-3

	Phase / Overlap	Type	Dimming				Power Up	Auto		Flash Together
			Red	Yellow	Green	Dark		Red	Yellow	
1	1	V				-	Auto	X		
2	2	V				-	Auto	X		X
3	3	V				-	Auto	X		
4	4	V				-	Auto	X		X
5	5	V				+	Auto	X		
6	6	V				+	Auto	X		X
7	7	V				+	Auto	X		
8	8	V				+	Auto	X		X
9	2	P				-	Auto			

10	4	P				-	Auto			
11	6	P				+	Auto			
12	8	P				+	Auto			
13	1	O				-	Auto	X		
14	2	O				+	Auto	X		X
15	3	O				-	Auto	X		
16	4	O				+	Auto	X		X

Colorado Springs

ECONOLITE

MOVING TRAFFIC FORWARD

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Configuration Port 1 (SDLC)

Port 1 SDLC (MM) 1-4-1

BIU	1	2	3	4	5	6	7	8
Term & Facility	X	X						
Detector Rack	X							

Enable TS2/MMU Type Cabinet: No
Enable MMU Extended Status: Yes
Enable SDLC Stop Time: Yes
Enable 3 Critical RFE's Lockup: Yes

MMU Program (MM) 1-4-2

Channel Can Serve With Channel	
Channel 1	**Channel 2**
1	5
1	6
1	11
2	5
2	6
2	9
2	11
3	7
3	8
3	12
4	7
4	8
4	10
4	12
5	9
6	9
6	11
7	10
8	10
8	12
9	11
10	12

Color Check Enable (MM) 1-4-3

Enable Color Check: No

MMU/LS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Green																
Yellow																
Red																

Secondary Stations/Tests (MM) 1-4-4

ID	1	2	3	4	5	6	7	8	MMU
Term & Facility									

ID	1	2	3	4	5	6	7	8	Diag
Detector Rack									

Enable SDLC Diagnostic Test: No

Colorado Springs

ECONOLITE

MOVING TRAFFIC FORWARD

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Configuration Communications 1 (SDLC)

Ethernet Port Configuration (MM) 1-5-1

DHCP Enable:	No
Controller IP:	10.70.10.51
Subnet Mask:	255.255.255.0
Default Gateway IP:	10.70.10.1
Server IP:	10.70.10.1

NTCIP (MM) 1-5-5

NTCIP Backup Time (Sec):	0
NTCIP UDP Port:	501
Ethernet Priority:	1
Port 2 Priority (Port C50S for 2070):	4
Port 3A Priority (Port C21S for 2070):	2
Port 3B Priority (Port C22S for 2070):	3

Port Configuration (MM) 1-5-2 to 1-5-4

Port	2 (C50S)	3A (C21S)	3B (C22S)
Comm Module	None	Auto	Auto
Protocol	TERMINAL	NTCIP	ECPIP
Enable	No	No	No
Data Rate (BPS)	9600	19.2K	1200
Data, Parity, Stop	8 N 1	8 N 1	8 N 1
Address	0	0	0
Telemetry Response Delay	0.0	0.0	0.9
Duplex - Half or Full	Half	Full	Full
Flow Control	Yes	Yes	Yes
Group Address	0	0	0
Single Flag Enable	Yes	Yes	Yes
RTS to CTS Delay	n/a	n/a	14.0
RTS Turn Off Delay	n/a	n/a	2.0
Dropout Time	10	10	10
Early RTS	n/a	n/a	No
Telemetry Mode	n/a	n/a	FSK
ATCS Railroad	0	n/a	n/a
ATCS Railroad Line	0	n/a	n/a
ATCS Group	0	n/a	n/a
Wayside Device	0	n/a	n/a
ATC Device	0	n/a	n/a
Wayside Subnode	0	n/a	n/a
ATC Subnode	0	n/a	n/a

ECPIP (MM) 1-5-6

Controller Address:	0
Expanded System Detector Address:	0

System Detector Assignment

System Detector	Local Detector

Wireless Configuration (MM) 1-5-7

Wireless Channel Number: 6
Wireless Access Code: 327723274

Colorado Springs

ECONOLITE

MOVING TRAFFIC FORWARD

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Configuration Logging / Display

Event Logging (MM) 1-6-1

Critical RFE's (MMU/TF)	Yes	3 Critical Errors Within 24 Hours	Yes
MMU Flash Faults	Yes	Local Flash Fault	Yes
Non-Critical RFE's (Det/Test)	Yes	Detector Errors	Yes
Coordination Errors	Yes	Controller Download	Yes
Preemption Events	Yes	TSP Events	Yes
Power On/Off	Yes	Low Battery	Yes
Access	Yes	Data Change	Yes
Online / Offline	Yes		

Alarm Event	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Enable Logging	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Display Options (MM) 1-7-2

Key Click Enable:	Yes
Switch to Graphics Mode:	No
LED Mode:	Auto
Display Mode:	Basic
Trans Mode Pop-Up Disable:	No

Sign On (MM) 8-5

Sign On Message Line 1: Solutions that Move the World
Sign On Message Line 2:

Software Modules (MM) 8-7

Application Version: 32.65.00
OS (Boot) Version: 06.05.00

Colorado Springs

ECONOLITE

MOVING TRAFFIC FORWARD

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Logic Processor Page 1

Logic Statement Control (MM) 1-8-1

Logic #	Statement Control
1	E
2	E
3	E
4	E
5	E
6	E
7	E
8	E
9	E
10	E
11	E
12	E

Colorado Springs

ECONOLITE

MOVING TRAFFIC FORWARD

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Logic Processor Page 2

Logic Statements (MM) 1-8-2

Colorado Springs

ECONOLITE

MOVING TRAFFIC FORWARD

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Controller Timing Plan (MM) 2-1

Plan 1 - ""

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Min Green	5	25	5	15	5	25	5	0	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	0	0	7	0	7	0	0	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	0	0	19	0	24	0	0	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	5.0	5.0	5.0	3.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	35	70	35	40	5	70	35	35	35	35	35	35	35	35	35	35
Max2	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	4.2	3.0	3.3	3.0	4.2	3.0	3.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	2.5	1.0	3.7	1.0	2.5	1.0	3.7	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Plan 2 - ""

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Min Green	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	16	0	16	0	16	0	16	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Max2	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Plan 3 - ""

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Min Green	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	16	0	16	0	16	0	16	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Max2	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Plan 4 - ""

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Direction	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Min Green	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Bk Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS Min Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Delay Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk	0	10	0	10	0	10	0	10	0	10	0	10	0	10	0	10
Walk2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Walk Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear	0	16	0	16	0	16	0	16	0	16	0	16	0	16	0	16
Ped Clear 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Clear Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle Ext	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Ext 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max1	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
Max2	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Max3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM Max	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dym Step	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Red Clear	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Red Max	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Act B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sec/Act	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Int	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Time B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cars Wt	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDuc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTReduc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Min Gap	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Colorado Springs

ECONOLITE

MOVING TRAFFIC FORWARD

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Controller Overlaps

Vehicle Overlaps (MM) 2-2

Overlap	Type	Lag Green	Yellow	Red	Adv. Green

Phases

Overlap	Phase	Included	Protect	Ped Protect	Not Overlap	Modifier	Lag X Phases	Lag 2 Phases	Flash Green

PPLT FYA

Overlap	Protected Phase (Left Turn)	Permissive Phase (Opposing Thru)	Flashing Arrow Output	Flashing Arrow Output CH	Delay Start of FYA	Delay Start of Clearance	Action Plan SF Bit Disable	Ped Protected Enable

Guaranteed Minimum Time Data (MM) 2-4

Phase	Min Green	Walk	Ped Clear	Yellow	Red Clear	Overlap Green
A01	5	0	7	3.0	0.0	5
B02	5	0	7	3.0	0.0	5
C03	5	0	7	3.0	0.0	5
D04	5	0	7	3.0	0.0	5
E05	5	0	7	3.0	0.0	5
F06	5	0	7	3.0	0.0	5
G07	5	0	7	3.0	0.0	5
H08	5	0	7	3.0	0.0	5
I09	5	0	7	3.0	0.0	5
J10	5	0	7	3.0	0.0	5
K11	5	0	7	3.0	0.0	5
L12	5	0	7	3.0	0.0	5
M13	5	0	7	3.0	0.0	5
N14	5	0	7	3.0	0.0	5
O15	5	0	7	3.0	0.0	5
P16	5	0	7	3.0	0.0	5

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MOVING TRAFFIC FORWARD

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Controller Pedestrian Overlaps
Vehicle / Pedestrian Overlaps (MM) 2-3

Included	Pedestrian Overlaps

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ECONOLITE

MOVING TRAFFIC FORWARD

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Controller Start / Flash Data (MM) 2-5

Start Up

Phase	Phase Setting
1	.
2	R
3	.
4	.
5	.
6	R
7	.
8	.
9	.
10	.
11	.
12	.
13	.
14	.
15	.
16	.

Overlap
B
F

Flash Thru Mon: Yes
Flash Time: 0
All Red: 0
Power Start Seq: 1
MUTCD Enabled: No
Y->G: n/a

Automatic Flash

Entry
2
6

Exit
2
6

Overlap Exit

A
B
C
D

Flash Thru Mon:	Yes
Exit Flash:	W
Minimum Flash:	8
Mimimum Recall:	No
Cycle Through Phase:	No

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ECONOLITE

MOVING TRAFFIC FORWARD

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Controller Options

Controller Options (MM) 2-6-1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Flashing Grn Ph	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Guar Passage																
Non-Act I																
Non-Act II				X				X								
Dual Entry		X				X										
Cond Service																
Cond Reservice																
Ped Re-Service																
Rest In Walk																
Flashing Walk																
Ped Clr-Yel																
Ped Clr-Red																
IGRN + Veh Ext																

Ped Clear Protect: Off Unit Red Revert: 2.0 MUTCD 3 Seconds Don't Walk: No

Pre-Timed Mode (MM) 2-7

Enable Pre-Timed Mode: No Free Input Disables Pre-Timed: No

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Pre-Timed																

Phase Recall Options (MM) 2-8

Plan # 1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Lock Detector									X	X	X	X	X	X	X	X
Vehicle Recall																
Ped Recall																
Max Recall																
Soft Recall																
No Rest																
AI Calc																

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MOVING TRAFFIC FORWARD

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Coordination Options

Options (MM) 3-1

Manual Pattern	Auto	ECPI Coord	Yes
System Source	TBC	System Format	STD
Splits In	Percent	Offsets In	Percent
Transition	Smooth	Max Select	MAXINH
Dwell / Add Time	0		
Delay Coord Wk-LZ	No	Force Off	Float
Offset Reference	Lead	Use Ped Time	Yes
Ped Recall	No	Ped Reservice	Yes
Local Zero Override	No	FO Added Ini Green	No
Re-sync Count	0	Multisync	No

Auto Perm Minimum Green (Seconds) (MM) 3-4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Minimum Green	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Split Demand (MM) 3-5

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Demand 1																
Demand 2																

Demand	1	2
Detector	0	0
Call Time (Sec)	0	0
Cycle Count	0	0

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ECONOLITE

MOVING TRAFFIC FORWARD

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Coordination Pattern Data
Coordinator Pattern Data (MM) 3-2

Coordinator Pattern # 1

Split Pattern	1	TS2 (Pat-Off)	0-1	Splits In	Percent
Cycle	85	Std (COS)	9	Offsets In	Percent
Offset Value	14%	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	0		
Phase Reservice	No	Action Plan	1		
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Splits (Split Pat 1)	0	67	0	33	0	67	0	0	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	67%	0%	0%

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Funciton Outputs																

Coordinator Pattern # 2

Split Pattern	2	TS2 (Pat-Off)	0-2	Splits In	Percent
Cycle	75	Std (COS)	17	Offsets In	Percent
Offset Value	0%	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	0		
Phase Reservice	No	Action Plan	2		
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Splits (Split Pat 2)	0	60	0	40	0	60	0	0	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	60%	0%	0%

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0	
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0	

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Funciton Outputs																

Coordinator Pattern # 3

Split Pattern	3	TS2 (Pat-Off)	0-3	Splits In	Percent
Cycle	120	Std (COS)	25	Offsets In	Percent
Offset Value	63%	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	0		
Phase Reservice	No	Action Plan	3		
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Splits (Split Pat 3)	0	71	0	29	0	71	0	0	0	0	0	0	0	0	0	0

Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	71%	0%	0%

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Funciton Outputs																

Coordinator Pattern # 4

Split Pattern	4	TS2 (Pat-Off)	1-1	Splits In	Percent
Cycle	75	Std (COS)	33	Offsets In	Percent
Offset Value	0%	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	0		
Phase Reservice	No	Action Plan	4		
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Splits (Split Pat 4)	0	60	0	40	0	60	0	0	0	0	0	0	0	0	0	0
Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	60%	0%	0%

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0	
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0	

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Funciton Outputs																

Coordinator Pattern # 5

Split Pattern	5	TS2 (Pat-Off)	1-2	Splits In	Percent
Cycle	85	Std (COS)	41	Offsets In	Percent
Offset Value	79%	Dwell/Add Time	0		
Actuated Coord	Yes	Timing Plan	1		
Actuated Walk Rest	No	Sequence	0		
Phase Reservice	No	Action Plan	5		
Max Select	None	Force Off	None		

Split Preference Phases

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Splits (Split Pat 5)	0	59	0	41	0	59	0	0	0	0	0	0	0	0	0	0

Pref 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pref 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Ring	1	2	3	4
Ring Split Ext	0	0	0	0
Ring Displacement	-	0	0	0
Split Sum	100%	59%	0%	0%

Misc. Data

Veh Perm 1	0	Veh Perm 2	0	Veh Perm 2 Disp	0
Split Demand Pat 1	0	Split Demand Pat 2	0	Crossing Arterial Pat	0

Split Pattern

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X
Special Funciton Outputs																

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ECONOLITE

MOVING TRAFFIC FORWARD

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Coordination Split Pattern
Split Pattern Data (MM) 3-3

Split Pattern # 1

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Split (percent)	0	67	0	33	0	67	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	100%	67%	0%	0%

Split Pattern # 2

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Split (percent)	0	60	0	40	0	60	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	100%	60%	0%	0%

Split Pattern # 3

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Split (percent)	0	71	0	29	0	71	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	100%	71%	0%	0%

Split Pattern # 4

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Split (percent)	0	60	0	40	0	60	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	100%	60%	0%	0%

Split Pattern # 5

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Description	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Split (percent)	0	59	0	41	0	59	0	0	0	0	0	0	0	0	0	0
Coord Phase		X				X										
Vehicle Recall																
Pedestrian Recall																
Recall to Max. Time																
Omit Phase									X	X	X	X	X	X	X	X

Ring	1	2	3	4
Split Sum	100%	59%	0%	0%

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ECONOLITE

MOVING TRAFFIC FORWARD

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Preempt Plan

Preempt Plan (MM) 4-1

No Enabled Preempts

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MOVING TRAFFIC FORWARD

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Preempt Preempt Filtering
Enable Preempt Filtering & TSP/SCP (MM) 4-2

Input	Solid	Pulsing
1	...BYPASSED...	...BYPASSED...
2	...BYPASSED...	...BYPASSED...
3	PREEMPTION 3	PREEMPTION 7
4	PREEMPTION 4	PREEMPTION 8
5	PREEMPTION 5	PREEMPTION 9
6	PREEMPTION 6	PREEMPTION 10
7	...BYPASSED...	...BYPASSED...
8	...BYPASSED...	...BYPASSED...
9	...BYPASSED...	...BYPASSED...
10	...BYPASSED...	...BYPASSED...

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ECONOLITE

MOVING TRAFFIC FORWARD

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Preempt TSP/SCP Plan and Split

TSP / SCP Plan (MM) 4-3

TSP/SCP Plan	Enable Option	Signal Type	Det Lock	Delay Time	Max Presence	PMT Enables Reservice	No Delay in TSP	Action SF Inhibit	Reservice Cycles	Bus Heading
1	No	Solid	No	0	0	No	False	0	0	NB
2	No	Solid	No	0	0	No	False	0	0	SB
3	No	Solid	No	0	0	No	False	0	0	EB
4	No	Solid	No	0	0	No	False	0	0	WB
5	No	Solid	No	0	0	No	False	0	0	.
6	No	Solid	No	0	0	No	False	0	0	.

Mode: TSP
Free Default Pattern: 120
Headway Allowance: 100

TSP/SCP Plan	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

TSP / SCP Split Pattern (MM) 4-4

TSP/SCP Split Pattern	Max Type	Phase															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
4	Max Reduction	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255	255

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MOVING TRAFFIC FORWARD

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Time Base Clock/Calendar

Clock/Calendar Data (MM) 5-1

Manual Action Plan:	0
SYNC Reference Time:	00:00
SYNC Reference:	Reference Time
Day Light Savings:	USDLS
Time Reset Input Set Time:	3:30:00
Standard Time From GMT:	-5

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MOVING TRAFFIC FORWARD

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Time Base Action Plan
Action Plan (MM) 5-2

Action Plan - 1 - "1"

Pattern	1	Override Sys	No
Timing Plan	1	Sequence	0
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	0	Ped Det Diag Plan	0
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																
Spec Func (1-8)																
Aux Func (1-3)																

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.					

Action Plan - 2 - "2"

Pattern	2	Override Sys	No
Timing Plan	1	Sequence	0
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	0	Ped Det Diag Plan	0
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)								

Aux Func (1-3)			

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.					

Action Plan - 3 - "3"

Pattern	3	Override Sys	No
Timing Plan	1	Sequence	0
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	0	Ped Det Diag Plan	0
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)								

Aux Func (1-3)			

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.					

Action Plan - 4 - "4"

Pattern	4	Override Sys	No
Timing Plan	1	Sequence	0
Veh Detector Plan	1	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	0	Ped Det Diag Plan	0
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)								

Aux Func (1-3)			

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.					

Action Plan - 5 - "5"

Pattern	5	Override Sys	No
Timing Plan	1	Sequence	0
Veh Detector Plan	0	Det Log	None
Flash	No	Red Rest	No
Veh Det Diag Plan	0	Ped Det Diag Plan	0
Dimming Enable	No	Pmt Veh Priority Ret	No
Pmt Ped Priority Ret	No	Pmt Queue Delay	No
Pmt Cond Delay	No		

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Ped Recall																
Walk 2																

Phase	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Veh Ext 2																
Veh Recall																
Max Recall																
Max 2																
Max 3																
CS Inhibit																
Omit																

Spec Func (1-8)								

Aux Func (1-3)			

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 91-100	.	.	.	.	.	.	.	.	.	.					

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ECONOLITE

MOVING TRAFFIC FORWARD

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Time Base Day Plan/Schedule
Day Plan (MM) 5-3

Day Plan #1 - "1"

Event	Action Plan	Start Time
1	1	06:00
2	2	10:00
3	3	15:15
4	4	20:30

Day Plan #2 - "2"

Event	Action Plan	Start Time
1	5	00:01

Schedule (MM) 5-4

Schedule Number - 1

Day Plan No.: 1

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	X	X	X	X	X	X	X	X	X	X	X	X

Day (DOW)	SUN	MON	TUE	WED	THU	FRI	SAT
		X	X	X	X	X	

Day (DOM)	1	2	3	4	5	6	7	8	9	10	11
	X	X	X	X	X	X	X	X	X	X	X
	12	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**
	X	X	X	X	X	X	X	X	X	X	X
	23	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**		
	X	X	X	X	X	X	X	X	X		

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ECONOLITE

MOVING TRAFFIC FORWARD

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Time Base Exceptions

Exception Day Program (MM) 5-5

Excep Day	Float/Fixed	Mon/Mon	DOW/DOM	WOM/Year	Day Plan

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MOVING TRAFFIC FORWARD

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Detectors

Detectors - Pg 1

Veh Det Phase Assignment (MM) 6-1

Vehicle Detector Plan Number - 1

Veh Detector	Assigned Phase	Called Phase	Type
1	2	2	N
2	2	2	N
3	4		N
4	4		N
5	6	6	N
6	6	6	N
7	7		N
9	9		N
10	10		N
11	11		N
12	12		N
13	13		N
14	14		N
15	15		N
16	16		N

Vehicle Detector Plan Number - 2

Veh Detector	Assigned Phase	Called Phase	Type
1	1		N
2	2		N
3	3		N
4	4		N
5	5		N
6	6		N
7	7		N
8	8		N
9	9		N
10	10		N
11	11		N
12	12		N
13	13		N
14	14		N
15	15		N
16	16		N

Vehicle Detector Plan Number - 3

Veh Detector	Assigned Phase	Called Phase	Type

1	1		N
2	2		N
3	3		N
4	4		N
5	5		N
6	6		N
7	7		N
8	8		N
9	9		N
10	10		N
11	11		N
12	12		N
13	13		N
14	14		N
15	15		N
16	16		N

Vehicle Detector Plan Number - 4

Veh Detector	Assigned Phase	Called Phase	Type
1	1		N
2	2		N
3	3		N
4	4		N
5	5		N
6	6		N
7	7		N
8	8		N
9	9		N
10	10		N
11	11		N
12	12		N
13	13		N
14	14		N
15	15		N
16	16		N

Vehicle Detector Setup (MM) 6-2

Veh Detector	Type	TS2 Detector	Description
1	N-NTCIP	Yes	
2	N-NTCIP	Yes	
3	N-NTCIP	Yes	
4	N-NTCIP	Yes	
5	N-NTCIP	Yes	
6	N-NTCIP	Yes	
7	N-NTCIP	Yes	
8	N-NTCIP	Yes	
9	N-NTCIP	Yes	
10	N-NTCIP	Yes	
11	N-NTCIP	Yes	
12	N-NTCIP	Yes	

13	N-NTCIP	Yes	
14	N-NTCIP	Yes	
15	N-NTCIP	Yes	
16	N-NTCIP	Yes	
17	N-NTCIP	Yes	
18	N-NTCIP	Yes	
19	N-NTCIP	Yes	
20	N-NTCIP	Yes	
21	N-NTCIP	Yes	
22	N-NTCIP	Yes	
23	N-NTCIP	Yes	
24	N-NTCIP	Yes	
25	N-NTCIP	Yes	
26	N-NTCIP	Yes	
27	N-NTCIP	Yes	
28	N-NTCIP	Yes	
29	N-NTCIP	Yes	
30	N-NTCIP	Yes	
31	N-NTCIP	Yes	
32	N-NTCIP	Yes	
33	N-NTCIP	Yes	
34	N-NTCIP	Yes	
35	N-NTCIP	Yes	
36	N-NTCIP	Yes	
37	N-NTCIP	Yes	
38	N-NTCIP	Yes	
39	N-NTCIP	Yes	
40	N-NTCIP	Yes	
41	N-NTCIP	Yes	
42	N-NTCIP	Yes	
43	N-NTCIP	Yes	
44	N-NTCIP	Yes	
45	N-NTCIP	Yes	
46	N-NTCIP	Yes	
47	N-NTCIP	Yes	
48	N-NTCIP	Yes	
49	N-NTCIP	Yes	
50	N-NTCIP	Yes	
51	N-NTCIP	Yes	
52	N-NTCIP	Yes	
53	N-NTCIP	Yes	
54	N-NTCIP	Yes	
55	N-NTCIP	Yes	
56	N-NTCIP	Yes	
57	N-NTCIP	Yes	
58	N-NTCIP	Yes	
59	N-NTCIP	Yes	
60	N-NTCIP	Yes	
61	N-NTCIP	Yes	
62	N-NTCIP	Yes	
63	N-NTCIP	Yes	

64	N-NTCIP	Yes	

Vehicle Detector Plan Number - 1

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
1	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
5	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	7	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	0	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
9	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

Vehicle Detector Plan Number - 2

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
1	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	3	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
5	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	7	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
9	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

Vehicle Detector Plan Number - 3

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay

1	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	3	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
5	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	7	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
9	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

Vehicle Detector Plan Number - 4

Veh Detector	Phase	ECPI Log	Call Option	Delay Time	Ext Option	Extend Time / Passage Time	Queue Lim. / Discon. Time	Use Added Initial	Cross Switch Ph	Lock In	NTCIP Vol.	NTCIP Occ.	Pmt Queue Delay
1	1	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
2	2	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
3	3	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
4	4	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
5	5	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
6	6	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
7	7	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
8	8	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
9	9	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
10	10	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
11	11	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
12	12	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
13	13	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
14	14	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
15	15	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No
16	16	No	Yes	0.0	Passage	0.0	0	No	0	None	No	No	No

Ped Detector Phase Assignment (MM) 6-3

Mode: NTCIP

Called Phase	Detector
1	1
2	2
3	3
4	4
5	5
6	6
7	7

Called Phase	Detector
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16

Colorado Springs

ECONOLITE

MOVING TRAFFIC FORWARD

Milton1 - James Snow Parkway @ Britannia Rd - Econolite Type - Cobalt

Detectors

Detectors - Pg 2

Log - Speed Detector Setup (MM) 6-4

NTCIP Log Period: 60 | ECPI Log Period: 0 | Length Unit: Inches

Speed Detector	Local Detector	One/Two Detector	Vehicle Length	Trap length	Enable Log
1	0	1	0	0	No
2	0	1	0	0	No
3	0	1	0	0	No
4	0	1	0	0	No
5	0	1	0	0	No
6	0	1	0	0	No
7	0	1	0	0	No
8	0	1	0	0	No
9	0	1	0	0	No
10	0	1	0	0	No
11	0	1	0	0	No
12	0	1	0	0	No
13	0	1	0	0	No
14	0	1	0	0	No
15	0	1	0	0	No
16	0	1	0	0	No

Vehicle Detector Diagnostics (MM) 6-5

Veh Diagnostic Plan Number - 1

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Veh Diagnostic Plan Number - 2

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Veh Diagnostic Plan Number - 3

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Veh Diagnostic Plan Number - 4

Det	Counts	Act	Pres	Multiplier	Failed Time	Failed Call Delay

Pedestrian Detector Diagnostics (MM) 6-6

Ped Diagnostic Plan Number - 1

Det	Counts	Act	Pres	Multiplier

Ped Diagnostic Plan Number - 2

Det	Counts	Act	Pres	Multiplier

Ped Diagnostic Plan Number - 3

Det	Counts	Act	Pres	Multiplier

Ped Diagnostic Plan Number - 4

Det	Counts	Act	Pres	Multiplier

Labeled as James Snow Parkway and Louis St. Laurent

Trafalgar Road and Derry Road

Pattern 1
Time: 7:00-9:00
Cycle Length: 180
Offset (%): 0%

Direction				
Phase	***1***	***2***	***3***	***4***
%	7	58	10	25
Direction				
Phase	**5**	**6**	**7**	**8**
%	10	55	10	25

Pattern 2
Time: 6:00 - 7:00
Cycle Length: 140
Offset (%): 0%

Direction				
Phase	***1***	***2***	***3***	***4***
%	9	51	9	31
Direction				
Phase	***5***	***6***	***7***	***8***
%	30 Max	30	9	31

Pattern 3
Time: 10:00 - 15:15 & 9:00 - 15:00
Cycle Length: 110
Offset (%): 20%

Direction				
Phase	***1***	***2***	***3***	***4***
%	11	40	10	39
Direction				
Phase	***5***	***6***	***7***	***8***
%	11	40	10	39

Pattern 4
Time: 15:15 - 16:15
Cycle Length:
Offset (%):

Direction				
Phase	***1***	***2***	***3***	***4***
%	11	44	13	32
Direction				
Phase	***5***	***6***	***7***	***8***
%	11	44	10	35

Pattern 5
Time: 15:00 - 16:30
Cycle Length: 140
Offset (%): 0%

Direction				
Phase	***1***	***2***	***3***	***4***
%	10	43	13	34
Direction				
Phase	**5**	**6**	**7**	**8**
%	10	43	13	34

Pattern 6
Time: 16:30-19:00
Cycle Length: 180
Offset (%): 0%

Direction				
Phase	***1***	***2***	***3***	***4***
%	10	47	13	30
Direction				
Phase	**5**	**6**	**7**	**8**
%	10	47	13	30

Date: 03-Jun-17
Intersection: Trafalgar Road & Lowerbase Line

8 Phase Basic Timing Sheet

	1	2	3	4	5	6	7	8	2 Ped	4 Ped	6 Ped	8 Ped
Phases in use	x	x	X	x		x		x				
Direction	SBLT	NB	WBLT	WB	NBLT	SB	EBLT	EB				
Min Green	7	25	7	10		25		10				
Veh Ext.	-	5.0	-	5.0		5.0		5.0				
Yellow	3	5	3	4		5		4				
Red	1	2	1	2		2		2				
Walk	-	-	-	-		-		-				
Don't Walk	-	-	-	-		-		-				
Max 1	15	63	11	42		78		31				
Max 2		65		45		65		45				
Max 3		60		30		60		30				
Veh Recall												
Ped Recall												

Notes:
Use Max 1 during AM Peak (6:00am-9:00am)
Use Max 2 during PM Peak (3:00pm-7:00pm)
Use Max 3 during OFF Peak (9:00am-3:00pm, 7:00pm-6:00am)

APPENDIX

B LEVEL OF SERVICE DEFINITIONS

Levels of Service – Highway Capacity Manual

Signalized Intersections

Level of Service	Stopped Delay per Vehicle (sec)	Expected delay to Minor Street traffic from the Major Street
A	< 10	Most vehicles arrive during the green phase and do not stop; traffic progression is extremely favourable.
B	10.1 - 20.0	More vehicles stop than for LOS A; traffic progression is good.
C	20.1 - 35.0	Individual cycle failures may appear and the number of vehicles stopping is significant; traffic progression is fair.
D	35.1 - 55.0	Individual cycle failures are noticeable and many vehicles stop; traffic progression is unfavourable.
E	55.1 - 80.0	Individual cycle failures are frequent; traffic progression is poor; acceptable delay is at its limit.
F	> 80	Many individual cycle failures; arrival flow rate exceeds capacity; delay is unacceptable to most drivers.

Source: Highway Capacity Manual, HCM2000

HIGHWAY LOS Signalized 12-09-18

Levels of Service – Highway Capacity Manual

Unsignalized Intersection

Level of Service	Average Control Delays (s/veh)	Expected delay to Minor Street traffic from the Major Street
A	0 - 10	Little or no delay.
B	> 10 – 15	Short traffic delay.
C	> 15 – 25	Average traffic delay.
D	> 25 – 35	Long traffic delay.
E	> 35 – 50	Very long traffic delay.
F	> 50	Extreme delay encountered with queuing, which may cause severe congestion affecting other traffic movements in the intersection.

Source: Highway Capacity Manual, HCM 2000

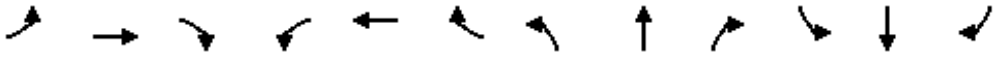
UNSIGNALIZED LOS 12-09-18

APPENDIX

C EXISTING CONDITIONS SYNCHRO OUTPUT REPORTS

Queues
1: Regional Road 25 & Britannia Road

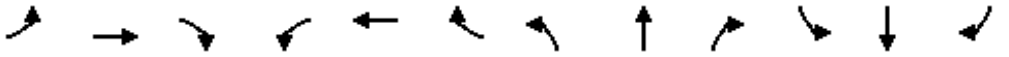
10-23-2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	310	1287	209	417	1056	83	350	1063	479	321	1406	173
v/c Ratio	0.81	0.96	0.34	0.99	0.76	0.15	0.93	0.70	0.68	0.84	0.93	0.28
Control Delay	75.0	62.7	8.3	100.7	46.4	5.6	90.1	41.4	23.2	78.1	54.7	5.5
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	75.0	62.7	8.3	100.7	46.4	5.6	90.1	41.4	23.2	78.1	54.7	5.5
Queue Length 50th (m)	42.0	140.5	4.0	58.0	106.2	0.0	48.4	101.8	53.8	43.9	150.3	0.0
Queue Length 95th (m)	#62.3	#175.2	22.7	#91.4	125.7	9.6	#76.7	120.8	94.2	#66.4	#184.0	15.5
Internal Link Dist (m)		239.5			177.4			308.0			325.9	
Turn Bay Length (m)	142.0		89.0	147.0		118.0	120.0		132.0	120.0		115.0
Base Capacity (vph)	390	1345	608	420	1395	559	378	1511	702	385	1509	623
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	0.79	0.96	0.34	0.99	0.76	0.15	0.93	0.70	0.68	0.83	0.93	0.28

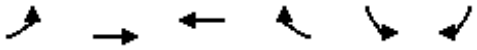
Intersection Summary

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



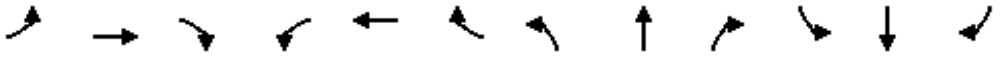
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	310	1287	209	417	1056	83	350	1063	479	321	1406	173
Future Volume (vph)	310	1287	209	417	1056	83	350	1063	479	321	1406	173
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	4.6	4.6	3.0	4.6	4.6
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3340	4520	1601	3340	4520	1601	3404	4391	1570	3471	4391	1484
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3340	4520	1601	3340	4520	1601	3404	4391	1570	3471	4391	1484
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	310	1287	209	417	1056	83	350	1063	479	321	1406	173
RTOR Reduction (vph)	0	0	132	0	0	57	0	0	162	0	0	114
Lane Group Flow (vph)	310	1287	77	417	1056	26	350	1063	317	321	1406	59
Heavy Vehicles (%)	6%	2%	2%	6%	2%	2%	4%	5%	4%	2%	5%	10%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	14.5	38.2	38.2	16.0	39.7	39.7	14.0	44.5	44.5	13.9	44.4	44.4
Effective Green, g (s)	15.5	40.2	40.2	17.0	41.7	41.7	15.0	46.5	46.5	14.9	46.4	46.4
Actuated g/C Ratio	0.11	0.30	0.30	0.13	0.31	0.31	0.11	0.34	0.34	0.11	0.34	0.34
Clearance Time (s)	4.0	7.8	7.8	4.0	7.8	7.8	4.0	6.6	6.6	4.0	6.6	6.6
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	3.2	3.2	3.0	3.2	3.2
Lane Grp Cap (vph)	383	1345	476	420	1396	494	378	1512	540	383	1509	510
v/s Ratio Prot	0.09	c0.28		c0.12	0.23		c0.10	0.24		0.09	c0.32	
v/s Ratio Perm			0.05			0.02			0.20			0.04
v/c Ratio	0.81	0.96	0.16	0.99	0.76	0.05	0.93	0.70	0.59	0.84	0.93	0.12
Uniform Delay, d1	58.3	46.5	35.0	58.9	42.1	32.8	59.4	38.3	36.4	58.9	42.8	30.3
Progression 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
Incremental Delay, d2	11.9	15.4	0.2	41.8	2.5	0.1	28.1	1.5	1.7	14.7	10.8	0.1
Delay (s)	70.2	61.9	35.2	100.8	44.6	32.8	87.6	39.8	38.0	73.6	53.5	30.4
Level of Service	E	E	D	F	D	C	F	D	D	E	D	C
Approach Delay (s)		60.3			59.0			48.2			54.8	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	55.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	89.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



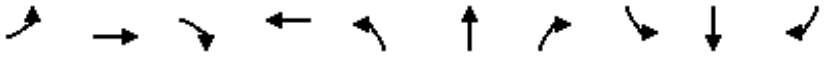
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	186	1932	1426	155	63	200
v/c Ratio	0.56	0.61	0.61	0.18	0.29	0.52
Control Delay	22.6	6.7	12.5	2.3	28.1	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.6	6.7	12.5	2.3	28.1	12.5
Queue Length 50th (m)	5.5	41.3	46.2	0.0	7.0	4.2
Queue Length 95th (m)	24.9	68.1	69.6	7.7	16.5	19.9
Internal Link Dist (m)		1174.8	1361.6			
Turn Bay Length (m)	130.0			85.0	85.0	85.0
Base Capacity (vph)	333	3151	2349	880	825	1002
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	0.56	0.61	0.61	0.18	0.08	0.20

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	186	1932	0	0	1426	155	0	0	0	63	0	200
Future Volume (vph)	186	1932	0	0	1426	155	0	0	0	63	0	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5			4.5	4.5				5.2		5.2
Lane Util. Factor	1.00	*0.80			*0.80	1.00				1.00		1.00
Frt	1.00	1.00			1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1789	4520			4391	1512				1772		1601
Flt Permitted	0.10	1.00			1.00	1.00				0.76		1.00
Satd. Flow (perm)	195	4520			4391	1512				1412		1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	186	1932	0	0	1426	155	0	0	0	63	0	200
RTOR Reduction (vph)	0	0	0	0	0	73	0	0	0	0	0	136
Lane Group Flow (vph)	186	1932	0	0	1426	82	0	0	0	63	0	64
Heavy Vehicles (%)	2%	2%	2%	2%	5%	8%	2%	2%	10%	3%	10%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm				Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	46.8	44.3			33.3	33.3				10.4		10.4
Effective Green, g (s)	47.8	46.3			35.3	35.3				10.4		10.4
Actuated g/C Ratio	0.72	0.70			0.53	0.53				0.16		0.16
Clearance Time (s)	4.0	6.5			6.5	6.5				5.2		5.2
Vehicle Extension (s)	3.0	5.0			5.0	5.0				5.0		5.0
Lane Grp Cap (vph)	332	3151			2334	803				221		250
v/s Ratio Prot	0.07	c0.43			0.32							
v/s Ratio Perm	0.34					0.05				c0.04		0.04
v/c Ratio	0.56	0.61			0.61	0.10				0.29		0.26
Uniform Delay, d1	13.4	5.3			10.8	7.7				24.7		24.6
Progression Factor	1.00	1.00			1.00	1.00				1.00		1.00
Incremental Delay, d2	2.2	0.5			0.7	0.1				1.5		1.1
Delay (s)	15.6	5.8			11.5	7.8				26.2		25.7
Level of Service	B	A			B	A				C		C
Approach Delay (s)		6.7			11.1			0.0			25.9	
Approach LOS		A			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	66.4	Sum of lost time (s)	10.7
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

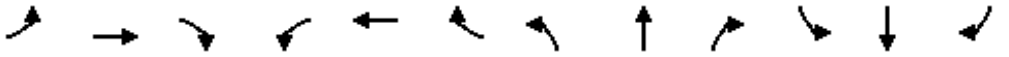


Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	49	2124	14	1085	239	63	240	389	139	279
v/c Ratio	0.18	0.77	0.01	0.47	0.76	0.18	0.61	1.02	0.39	0.70
Control Delay	10.4	18.4	0.0	17.0	47.3	35.9	21.3	87.1	39.6	26.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.4	18.4	0.0	17.0	47.3	35.9	21.3	87.1	39.6	26.9
Queue Length 50th (m)	3.3	117.0	0.0	54.4	38.2	10.7	14.9	~72.6	24.4	21.7
Queue Length 95th (m)	10.0	185.7	0.0	84.9	61.1	22.1	39.0	#118.9	42.4	49.9
Internal Link Dist (m)		1361.6		653.2		218.8			343.3	
Turn Bay Length (m)	85.0		85.0		85.0		85.0	85.0		85.0
Base Capacity (vph)	276	2753	1018	2730	315	713	675	381	721	672
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.77	0.01	0.40	0.76	0.09	0.36	1.02	0.19	0.42

Intersection Summary

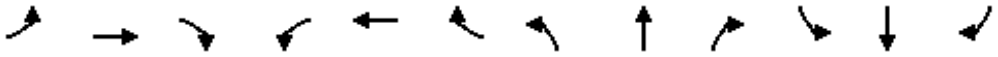
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	2124	14	0	1085	0	239	63	240	389	139	279
Future Volume (vph)	49	2124	14	0	1085	0	239	63	240	389	139	279
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9		4.9		4.5	3.2	5.2	4.5	3.2	5.2
Lane Util. Factor	1.00	*0.80	1.00		*0.80		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1738	4520	1601		4309		1789	1883	1601	1789	1883	1570
Flt Permitted	0.16	1.00	1.00		1.00		0.53	1.00	1.00	0.70	1.00	1.00
Satd. Flow (perm)	295	4520	1601		4309		1000	1883	1601	1317	1883	1570
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	49	2124	14	0	1085	0	239	63	240	389	139	279
RTOR Reduction (vph)	0	0	5	0	0	0	0	0	131	0	0	133
Lane Group Flow (vph)	49	2124	9	0	1085	0	239	63	109	389	139	146
Heavy Vehicles (%)	5%	2%	2%	2%	7%	5%	2%	2%	2%	2%	2%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	61.8	61.8	61.8		53.5		25.3	17.0	17.0	26.1	17.4	17.4
Effective Green, g (s)	62.8	63.8	63.8		55.5		25.3	19.0	17.0	26.1	19.4	17.4
Actuated g/C Ratio	0.60	0.61	0.61		0.53		0.24	0.18	0.16	0.25	0.19	0.17
Clearance Time (s)	4.0	6.9	6.9		6.9		4.5	5.2	5.2	4.5	5.2	5.2
Vehicle Extension (s)	3.0	5.0	5.0		5.0		3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	251	2770	981		2297		305	343	261	369	350	262
v/s Ratio Prot	0.01	c0.47			0.25		0.06	0.03		c0.09	0.07	
v/s Ratio Perm	0.11		0.01				0.13		0.07	c0.18		0.09
v/c Ratio	0.20	0.77	0.01		0.47		0.78	0.18	0.42	1.05	0.40	0.56
Uniform Delay, d1	9.6	14.7	7.8		15.2		35.8	36.0	39.1	38.2	37.2	39.8
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	1.6	0.0		0.3		12.4	0.5	2.3	61.8	1.5	4.3
Delay (s)	10.0	16.3	7.9		15.5		48.1	36.5	41.4	100.0	38.8	44.1
Level of Service	A	B	A		B		D	D	D	F	D	D
Approach Delay (s)		16.1			15.5			43.8			70.1	
Approach LOS		B			B			D			E	

Intersection Summary			
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	104.1	Sum of lost time (s)	15.6
Intersection Capacity Utilization	89.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

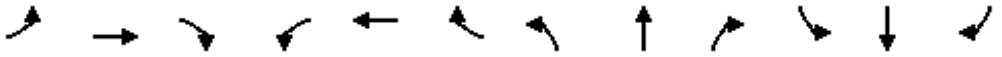


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	419	1772	563	219	868	186	398	1644	277	336	1168	180
v/c Ratio	0.88	1.03	0.72	0.98	0.67	0.31	0.82	1.05	0.43	1.04	0.86	0.31
Control Delay	78.8	70.9	23.2	120.3	46.1	6.3	73.3	80.4	20.0	122.0	53.8	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.8	70.9	23.2	120.3	46.1	6.3	73.3	80.4	20.0	122.0	53.8	8.0
Queue Length 50th (m)	59.2	~217.4	68.0	31.8	88.2	0.0	56.0	~205.7	29.6	~51.7	127.3	2.7
Queue Length 95th (m)	#85.7	#250.6	113.3	#58.1	106.1	17.3	#78.8	#239.2	54.8	#82.5	148.8	20.2
Internal Link Dist (m)		653.2			686.5			2451.0			163.2	
Turn Bay Length (m)	130.0		85.0	85.0		95.0	85.0		85.0	230.0		85.0
Base Capacity (vph)	482	1727	786	223	1292	596	484	1569	641	322	1359	583
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	0.87	1.03	0.72	0.98	0.67	0.31	0.82	1.05	0.43	1.04	0.86	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.



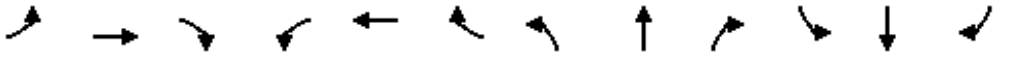
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	419	1772	563	219	868	186	398	1644	277	336	1168	180
Future Volume (vph)	419	1772	563	219	868	186	398	1644	277	336	1168	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.4	5.4	3.0	5.4	5.4
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3248	4520	1601	3471	4309	1555	3471	4520	1601	3471	4520	1555
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3248	4520	1601	3471	4309	1555	3471	4520	1601	3471	4520	1555
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	419	1772	563	219	868	186	398	1644	277	336	1168	180
RTOR Reduction (vph)	0	0	175	0	0	130	0	0	86	0	0	116
Lane Group Flow (vph)	419	1772	388	219	868	56	398	1644	191	336	1168	64
Heavy Vehicles (%)	9%	2%	2%	2%	7%	5%	2%	2%	2%	2%	2%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	19.5	51.5	51.5	8.0	40.0	40.0	18.5	46.6	46.6	12.0	40.1	40.1
Effective Green, g (s)	20.5	53.5	53.5	9.0	42.0	42.0	19.5	48.6	48.6	13.0	42.1	42.1
Actuated g/C Ratio	0.15	0.38	0.38	0.06	0.30	0.30	0.14	0.35	0.35	0.09	0.30	0.30
Clearance Time (s)	4.0	6.5	6.5	4.0	6.5	6.5	4.0	7.4	7.4	4.0	7.4	7.4
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	5.0	5.0
Lane Grp Cap (vph)	475	1727	611	223	1292	466	483	1569	555	322	1359	467
v/s Ratio Prot	c0.13	c0.39		c0.06	0.20		0.11	c0.36		c0.10	0.26	
v/s Ratio Perm			0.24			0.04			0.12			0.04
v/c Ratio	0.88	1.03	0.64	0.98	0.67	0.12	0.82	1.05	0.34	1.04	0.86	0.14
Uniform Delay, d1	58.6	43.2	35.3	65.4	43.0	35.6	58.6	45.7	33.9	63.5	46.2	35.7
Progression 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
Incremental Delay, d2	17.3	28.6	3.0	54.9	1.8	0.2	10.9	36.4	0.4	61.9	6.2	0.3
Delay (s)	75.8	71.8	38.3	120.3	44.8	35.8	69.5	82.1	34.3	125.4	52.4	36.0
Level of Service	E	E	D	F	D	D	E	F	C	F	D	D
Approach Delay (s)		65.6			56.5			74.2			65.2	
Approach LOS		E			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	66.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.9
Intersection Capacity Utilization	96.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	395	1978	12	1	954	120	67	480	17	95	251
v/c Ratio	0.96	0.78	0.01	0.01	0.59	0.18	0.16	0.80	0.17	0.15	0.37
Control Delay	58.8	21.0	0.0	10.0	27.3	4.8	25.0	39.2	29.2	23.9	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.8	21.0	0.0	10.0	27.3	4.8	25.0	39.2	29.2	23.9	5.0
Queue Length 50th (m)	54.2	119.7	0.0	0.1	63.5	0.0	8.8	75.8	2.3	12.3	0.0
Queue Length 95th (m)	#123.2	183.3	0.0	0.8	81.5	11.1	20.1	125.0	8.3	25.4	16.6
Internal Link Dist (m)		686.5			658.0			300.4		386.3	
Turn Bay Length (m)	125.0		85.0	135.0		85.0	122.0				85.0
Base Capacity (vph)	411	2557	924	194	1896	765	504	702	121	730	762
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.77	0.01	0.01	0.50	0.16	0.13	0.68	0.14	0.13	0.33

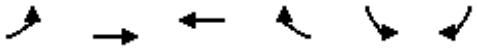
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	395	1978	12	1	954	120	67	297	183	17	95	251
Future Volume (vph)	395	1978	12	1	954	120	67	297	183	17	95	251
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.5	3.5		4.5	3.5	5.5
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1674	4520	1585	1789	4350	1601	1789	1713		1789	1830	1601
Flt Permitted	0.15	1.00	1.00	0.10	1.00	1.00	0.69	1.00		0.17	1.00	1.00
Satd. Flow (perm)	273	4520	1585	194	4350	1601	1297	1713		312	1830	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	395	1978	12	1	954	120	67	297	183	17	95	251
RTOR Reduction (vph)	0	0	5	0	0	73	0	21	0	0	0	174
Lane Group Flow (vph)	395	1978	7	1	954	47	67	459	0	17	95	77
Heavy Vehicles (%)	9%	2%	3%	2%	6%	2%	2%	8%	2%	2%	5%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	58.5	53.5	53.5	38.9	37.9	37.9	31.4	31.4		31.4	31.4	31.4
Effective Green, g (s)	59.5	55.5	55.5	40.9	39.9	39.9	32.4	33.4		32.4	33.4	31.4
Actuated g/C Ratio	0.58	0.54	0.54	0.40	0.39	0.39	0.32	0.33		0.32	0.33	0.31
Clearance Time (s)	4.0	6.5	6.5	4.0	6.5	6.5	5.5	5.5		5.5	5.5	5.5
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	5.0	5.0		5.0	5.0	5.0
Lane Grp Cap (vph)	401	2461	863	109	1703	626	412	561		99	599	493
v/s Ratio Prot	c0.17	0.44		0.00	0.22			c0.27			0.05	
v/s Ratio Perm	c0.41		0.00	0.00		0.03	0.05			0.05		0.05
v/c Ratio	0.99	0.80	0.01	0.01	0.56	0.08	0.16	0.82		0.17	0.16	0.16
Uniform Delay, d1	23.8	18.8	10.6	20.1	24.2	19.4	25.0	31.5		25.1	24.3	25.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	40.6	2.1	0.0	0.0	0.5	0.1	0.4	10.2		1.7	0.3	0.3
Delay (s)	64.5	20.9	10.6	20.1	24.7	19.5	25.4	41.7		26.8	24.5	25.9
Level of Service	E	C	B	C	C	B	C	D		C	C	C
Approach Delay (s)		28.1			24.1			39.7			25.6	
Approach LOS		C			C			D			C	

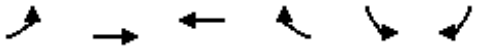
Intersection Summary			
HCM 2000 Control Delay	28.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	101.9	Sum of lost time (s)	11.0
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	373	1805	998	474	363	78
v/c Ratio	0.84	0.61	0.54	0.54	0.41	0.17
Control Delay	30.0	11.0	19.3	4.4	23.2	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	11.0	19.3	4.4	23.2	6.6
Queue Length 50th (m)	22.6	51.7	37.3	0.0	20.3	0.0
Queue Length 95th (m)	#66.2	64.5	49.0	17.1	31.2	8.8
Internal Link Dist (m)		658.0	685.0		264.0	
Turn Bay Length (m)	125.0			85.0		
Base Capacity (vph)	442	2938	1836	876	892	469
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	0.84	0.61	0.54	0.54	0.41	0.17

Intersection Summary

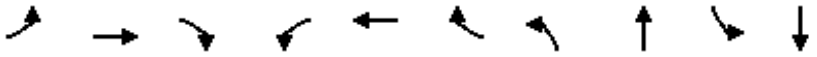
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	373	1805	998	474	363	78
Future Volume (vph)	373	1805	998	474	363	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.5	6.5	6.5	5.5	5.5
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1789	5142	5142	1601	3471	1601
Flt Permitted	0.19	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	358	5142	5142	1601	3471	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	373	1805	998	474	363	78
RTOR Reduction (vph)	0	0	0	305	0	58
Lane Group Flow (vph)	373	1805	998	169	363	20
Turn Type	pm+pt	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases	2			6	4	4
Actuated Green, G (s)	40.0	40.0	25.0	25.0	18.0	18.0
Effective Green, g (s)	40.0	40.0	25.0	25.0	18.0	18.0
Actuated g/C Ratio	0.57	0.57	0.36	0.36	0.26	0.26
Clearance Time (s)	4.0	6.5	6.5	6.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	429	2938	1836	571	892	411
v/s Ratio Prot	c0.14	0.35	0.19			
v/s Ratio Perm	c0.36			0.11	c0.10	0.01
v/c Ratio	0.87	0.61	0.54	0.30	0.41	0.05
Uniform Delay, d1	10.8	9.9	17.9	16.2	21.6	19.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	16.9	0.4	0.3	0.3	1.4	0.2
Delay (s)	27.7	10.3	18.3	16.5	22.9	19.8
Level of Service	C	B	B	B	C	B
Approach Delay (s)		13.3	17.7		22.4	
Approach LOS		B	B		C	

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

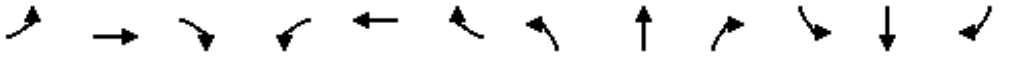
c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	135	1912	120	69	1203	498	268	383	357	161
v/c Ratio	0.56	0.90	0.16	0.38	0.65	0.51	0.89	0.52	0.72	0.51
Control Delay	23.5	36.7	7.8	19.4	28.5	4.3	78.5	43.1	56.2	49.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.5	36.7	7.8	19.4	28.5	4.3	78.5	43.1	56.2	49.2
Queue Length 50th (m)	13.7	165.7	4.2	6.7	86.9	0.9	59.9	40.7	39.9	33.6
Queue Length 95th (m)	29.5	#231.3	16.2	15.3	118.0	21.7	#117.2	56.9	58.2	54.4
Internal Link Dist (m)		685.0			1030.1			436.1		413.0
Turn Bay Length (m)	85.0		85.0	85.0		85.0	85.0		85.0	
Base Capacity (vph)	260	2114	739	183	1886	976	300	1251	580	618
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.90	0.16	0.38	0.64	0.51	0.89	0.31	0.62	0.26

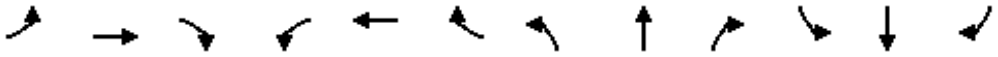
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	1912	120	69	1203	498	268	361	22	357	161	0
Future Volume (vph)	135	1912	120	69	1203	498	268	361	22	357	161	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.5	3.2		4.5	3.2	
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	0.95		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1789	4520	1484	1706	4309	1601	1690	3548		3471	1812	
Flt Permitted	0.10	1.00	1.00	0.08	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	192	4520	1484	146	4309	1601	1690	3548		3471	1812	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	135	1912	120	69	1203	498	268	361	22	357	161	0
RTOR Reduction (vph)	0	0	46	0	0	278	0	4	0	0	0	0
Lane Group Flow (vph)	135	1912	74	69	1203	220	268	379	0	357	161	0
Heavy Vehicles (%)	2%	2%	10%	7%	7%	2%	8%	2%	2%	2%	6%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6						4
Actuated Green, G (s)	60.5	51.6	51.6	53.7	48.2	48.2	20.4	21.8		16.4	17.8	
Effective Green, g (s)	62.1	53.6	53.6	55.7	50.2	50.2	20.4	23.8		16.4	19.8	
Actuated g/C Ratio	0.54	0.46	0.46	0.48	0.43	0.43	0.18	0.21		0.14	0.17	
Clearance Time (s)	4.0	6.5	6.5	4.0	6.5	6.5	4.5	5.2		4.5	5.2	
Vehicle Extension (s)	2.5	5.0	5.0	2.5	5.0	5.0	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	240	2097	688	158	1872	695	298	731		492	310	
v/s Ratio Prot	c0.05	c0.42		0.02	0.28		c0.16	c0.11		0.10	0.09	
v/s Ratio Perm	0.25		0.05	0.19		0.14						
v/c Ratio	0.56	0.91	0.11	0.44	0.64	0.32	0.90	0.52		0.73	0.52	
Uniform Delay, d1	17.3	28.8	17.5	24.1	25.6	21.4	46.5	40.8		47.4	43.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.4	6.9	0.1	1.4	1.0	0.6	27.6	1.2		5.3	2.9	
Delay (s)	19.7	35.6	17.6	25.5	26.7	22.0	74.2	42.0		52.7	46.4	
Level of Service	B	D	B	C	C	C	E	D		D	D	
Approach Delay (s)		33.6			25.3			55.2			50.7	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	35.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	115.5	Sum of lost time (s)	15.2
Intersection Capacity Utilization	80.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	137	1660	491	254	1164	255	517	1731	505	624	1875	119
v/c Ratio	0.70	1.21	0.74	1.10	0.86	0.42	1.09	1.19	0.82	1.05	1.17	0.20
Control Delay	81.5	140.7	25.3	145.0	51.6	10.3	119.4	133.0	43.0	104.1	124.0	9.0
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	81.5	140.7	25.3	145.0	51.6	10.3	119.4	133.0	43.0	104.1	124.0	9.0
Queue Length 50th (m)	18.8	~224.0	52.9	~39.4	121.7	8.9	~79.4	~231.5	96.7	~93.2	~248.2	3.9
Queue Length 95th (m)	#32.5	#257.5	96.7	#66.8	143.5	31.2	#114.2	#265.0	#148.1	#129.7	#281.3	17.1
Internal Link Dist (m)		309.3			173.0			421.7			476.7	
Turn Bay Length (m)	50.0		70.0	90.0		70.0	165.0		70.0	140.0		70.0
Base Capacity (vph)	195	1376	662	231	1350	608	476	1453	616	593	1597	600
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	0.70	1.21	0.74	1.10	0.86	0.42	1.09	1.19	0.82	1.05	1.17	0.20

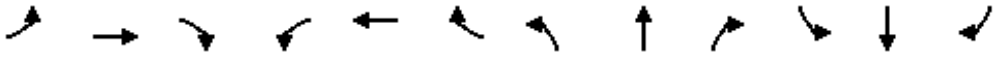
Intersection Summary

~ 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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	137	1660	491	254	1164	255	517	1731	505	624	1875	119
Future Volume (vph)	137	1660	491	254	1164	255	517	1731	505	624	1875	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3219	4520	1541	3471	4350	1498	3219	4350	1601	3340	4391	1484
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3219	4520	1541	3471	4350	1498	3219	4350	1601	3340	4391	1484
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	137	1660	491	254	1164	255	517	1731	505	624	1875	119
RTOR Reduction (vph)	0	0	193	0	0	143	0	0	82	0	0	61
Lane Group Flow (vph)	137	1660	298	254	1164	112	517	1731	423	624	1875	58
Heavy Vehicles (%)	10%	2%	6%	2%	6%	9%	10%	6%	2%	6%	5%	10%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	7.2	39.1	39.1	8.0	39.9	39.9	19.0	43.1	43.1	23.0	47.1	47.1
Effective Green, g (s)	8.2	41.1	41.1	9.0	41.9	41.9	20.0	45.1	45.1	24.0	49.1	49.1
Actuated g/C Ratio	0.06	0.30	0.30	0.07	0.31	0.31	0.15	0.33	0.33	0.18	0.36	0.36
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	195	1376	469	231	1350	464	476	1453	534	593	1597	539
v/s Ratio Prot	0.04	c0.37		c0.07	0.27		c0.16	0.40		c0.19	c0.43	
v/s Ratio Perm			0.19			0.07			0.26			0.04
v/c Ratio	0.70	1.21	0.63	1.10	0.86	0.24	1.09	1.19	0.79	1.05	1.17	0.11
Uniform Delay, d1	62.2	47.0	40.5	63.0	43.8	34.7	57.5	45.0	40.7	55.5	42.9	28.4
Progression 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
Incremental Delay, d2	10.9	100.0	3.2	88.4	6.1	0.4	66.5	93.2	9.0	51.5	85.3	0.2
Delay (s)	73.1	146.9	43.6	151.4	49.9	35.1	124.0	138.2	49.7	107.0	128.3	28.6
Level of Service	E	F	D	F	D	D	F	F	D	F	F	C
Approach Delay (s)		120.3			63.1			119.3			118.7	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	109.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	15.8
Intersection Capacity Utilization	105.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

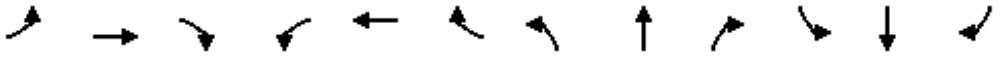


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	393	1157	389	267	698	153	207	1813	228	166	1027	231
v/c Ratio	0.72	0.88	0.56	0.79	0.64	0.26	0.63	1.08	0.33	0.85	0.71	0.35
Control Delay	65.0	51.2	22.0	79.7	46.1	6.6	70.7	88.8	13.5	101.1	45.9	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.0	51.2	22.0	79.7	46.1	6.6	70.7	88.8	13.5	101.1	45.9	5.7
Queue Length 50th (m)	56.0	160.0	47.1	39.2	89.3	0.0	29.8	~245.6	16.1	24.8	109.6	0.0
Queue Length 95th (m)	70.7	189.1	79.2	#58.6	116.5	16.5	43.5	#278.6	37.0	#45.8	128.9	18.6
Internal Link Dist (m)		214.6			322.8			302.9			114.0	
Turn Bay Length (m)	85.0		140.0	85.0		85.0	115.0		85.0	85.0		85.0
Base Capacity (vph)	726	1382	726	347	1096	596	340	1681	685	195	1444	666
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	0.54	0.84	0.54	0.77	0.64	0.26	0.61	1.08	0.33	0.85	0.71	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.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	393	1157	389	267	698	153	207	1813	228	166	1027	231
Future Volume (vph)	393	1157	389	267	698	153	207	1813	228	166	1027	231
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.8	3.8	3.0	3.8	3.8	3.0	5.4	5.4	3.0	5.4	5.4
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3437	3579	1601	3471	3579	1601	3219	4520	1601	3471	4433	1570
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3437	3579	1601	3471	3579	1601	3219	4520	1601	3471	4433	1570
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	393	1157	389	267	698	153	207	1813	228	166	1027	231
RTOR Reduction (vph)	0	0	111	0	0	106	0	0	90	0	0	156
Lane Group Flow (vph)	393	1157	278	267	698	47	207	1813	138	166	1027	75
Heavy Vehicles (%)	3%	2%	2%	2%	2%	2%	10%	2%	2%	2%	4%	4%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	21.5	50.1	50.1	12.9	41.5	41.5	13.6	50.9	50.9	7.0	44.3	44.3
Effective Green, g (s)	22.5	52.1	52.1	13.9	43.5	43.5	14.6	52.9	52.9	8.0	46.3	46.3
Actuated g/C Ratio	0.16	0.37	0.37	0.10	0.31	0.31	0.10	0.37	0.37	0.06	0.33	0.33
Clearance Time (s)	4.0	5.8	5.8	4.0	5.8	5.8	4.0	7.4	7.4	4.0	7.4	7.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	544	1312	586	339	1095	490	330	1682	596	195	1444	511
v/s Ratio Prot	c0.11	c0.32		c0.08	0.20		0.06	c0.40		c0.05	0.23	
v/s Ratio Perm			0.17			0.03			0.09			0.05
v/c Ratio	0.72	0.88	0.47	0.79	0.64	0.10	0.63	1.08	0.23	0.85	0.71	0.15
Uniform Delay, d1	56.8	42.1	34.5	62.7	42.5	35.2	61.1	44.6	30.6	66.5	42.0	33.9
Progression 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
Incremental Delay, d2	4.7	7.3	0.6	11.5	1.2	0.1	5.2	46.3	0.4	28.2	2.1	0.3
Delay (s)	61.5	49.4	35.1	74.1	43.7	35.3	66.3	90.9	31.0	94.7	44.1	34.2
Level of Service	E	D	D	E	D	D	E	F	C	F	D	C
Approach Delay (s)		49.0			49.8			82.5			48.4	
Approach LOS		D			D			F			D	

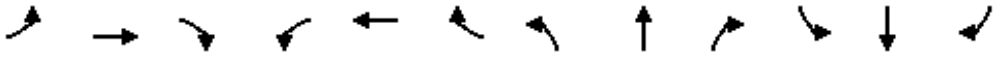
Intersection Summary			
HCM 2000 Control Delay	60.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	142.1	Sum of lost time (s)	15.2
Intersection Capacity Utilization	93.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	262	41	663	231	47	32	2016	71	180	1745	25
v/c Ratio	0.56	0.06	1.08	0.49	0.08	0.21	1.00	0.10	1.00	0.78	0.03
Control Delay	35.4	25.0	90.1	33.3	9.2	13.6	51.4	6.0	92.4	26.4	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.4	25.0	90.1	33.3	9.2	13.6	51.4	6.0	92.4	26.4	0.3
Queue Length 50th (m)	45.6	5.9	~143.5	39.0	0.7	2.8	~176.5	1.2	~23.8	132.7	0.0
Queue Length 95th (m)	72.2	13.5	#212.8	62.8	8.6	6.9	#221.7	9.0	#68.1	156.6	0.6
Internal Link Dist (m)		483.8			361.2		451.9			2451.0	
Turn Bay Length (m)	85.0		85.0	85.0		85.0		85.0	85.0		85.0
Base Capacity (vph)	464	640	614	467	582	151	2013	747	180	2247	826
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.06	1.08	0.49	0.08	0.21	1.00	0.10	1.00	0.78	0.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

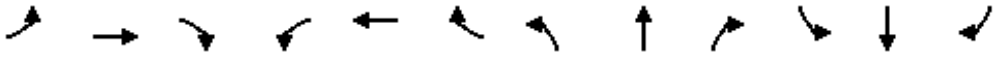
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	262	41	663	231	5	42	32	2016	71	180	1745	25
Future Volume (vph)	262	41	663	231	5	42	32	2016	71	180	1745	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6		4.5	7.6	7.6	4.5	7.6	7.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	1883	1601	1789	1631		1789	4520	1601	1789	4520	1601
Flt Permitted	0.73	1.00	1.00	0.73	1.00		0.08	1.00	1.00	0.07	1.00	1.00
Satd. Flow (perm)	1368	1883	1601	1376	1631		148	4520	1601	138	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	262	41	663	231	5	42	32	2016	71	180	1745	25
RTOR Reduction (vph)	0	0	71	0	28	0	0	0	33	0	0	13
Lane Group Flow (vph)	262	41	592	231	19	0	32	2016	38	180	1745	12
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	37.4	37.4	37.4	37.4	37.4		53.8	50.8	50.8	61.6	54.7	54.7
Effective Green, g (s)	37.4	37.4	37.4	37.4	37.4		53.8	50.8	50.8	61.6	54.7	54.7
Actuated g/C Ratio	0.33	0.33	0.33	0.33	0.33		0.48	0.45	0.45	0.55	0.49	0.49
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6		4.5	7.6	7.6	4.5	7.6	7.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	457	629	535	460	545		115	2053	727	177	2211	783
v/s Ratio Prot		0.02			0.01		0.01	0.45		c0.06	0.39	
v/s Ratio Perm	0.19		c0.37	0.17			0.13		0.02	c0.50		0.01
v/c Ratio	0.57	0.07	1.11	0.50	0.03		0.28	0.98	0.05	1.02	0.79	0.02
Uniform Delay, d1	30.6	25.3	37.2	29.8	25.0		19.0	30.0	17.0	31.1	23.8	14.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.7	0.0	71.7	0.9	0.0		1.3	16.0	0.1	72.1	3.0	0.0
Delay (s)	32.4	25.4	108.9	30.6	25.1		20.3	46.1	17.2	103.2	26.7	14.7
Level of Service	C	C	F	C	C		C	D	B	F	C	B
Approach Delay (s)		84.6			29.7			44.7			33.6	
Approach LOS		F			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	47.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	111.8	Sum of lost time (s)	16.7
Intersection Capacity Utilization	101.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

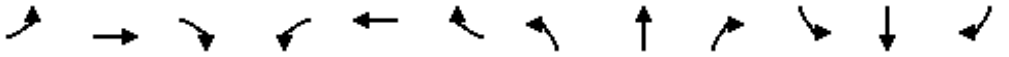


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	46	2142	368	211	1296	749	464	1772	890	218	1032	66
v/c Ratio	0.23	1.24	0.50	0.64	0.68	0.82	1.26	1.20	1.11	1.08	0.82	0.12
Control Delay	63.5	149.7	15.2	68.3	33.5	31.4	186.3	134.3	97.2	145.6	51.2	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.5	149.7	15.2	68.3	33.5	31.4	186.3	134.3	97.2	145.6	51.2	0.5
Queue Length 50th (m)	6.1	~294.7	29.6	28.4	117.5	147.5	~79.8	~237.6	~260.4	~33.4	107.1	0.0
Queue Length 95th (m)	12.7	#326.9	58.2	41.6	137.4	211.4	#113.5	#271.1	#338.5	#59.3	127.5	0.0
Internal Link Dist (m)		888.5			759.7			657.0			690.8	
Turn Bay Length (m)	130.0		110.0	300.0		70.0	110.0		70.0	130.0		85.0
Base Capacity (vph)	201	1727	742	330	1894	915	367	1482	803	201	1256	548
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	0.23	1.24	0.50	0.64	0.68	0.82	1.26	1.20	1.11	1.08	0.82	0.12

Intersection Summary

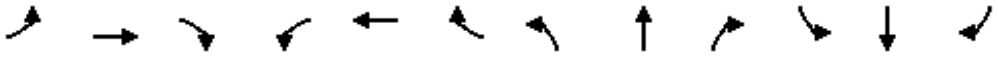
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	2142	368	211	1296	749	464	1772	890	218	1032	66
Future Volume (vph)	46	2142	368	211	1296	749	464	1772	890	218	1032	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.8	5.8	3.0	5.8	2.0	3.0	4.6	2.0	3.0	4.6	4.6
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3404	4520	1601	3437	4350	1601	3309	4350	1601	3404	4350	1484
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3404	4520	1601	3437	4350	1601	3309	4350	1601	3404	4350	1484
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	46	2142	368	211	1296	749	464	1772	890	218	1032	66
RTOR Reduction (vph)	0	0	130	0	0	47	0	0	40	0	0	47
Lane Group Flow (vph)	46	2142	238	211	1296	702	464	1772	850	218	1032	19
Heavy Vehicles (%)	4%	2%	2%	3%	6%	2%	7%	6%	2%	4%	6%	10%
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6	7	3	8	1	7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	5.6	50.4	50.4	12.0	56.8	63.8	14.0	44.0	56.0	7.0	37.0	37.0
Effective Green, g (s)	6.6	52.4	52.4	13.0	58.8	67.8	15.0	46.0	60.0	8.0	39.0	39.0
Actuated g/C Ratio	0.05	0.39	0.39	0.10	0.43	0.50	0.11	0.34	0.44	0.06	0.29	0.29
Clearance Time (s)	4.0	7.8	7.8	4.0	7.8	4.0	4.0	6.6	4.0	4.0	6.6	6.6
Vehicle Extension (s)	5.0	3.0	3.0	5.0	3.0	4.0	4.0	5.0	5.0	4.0	5.0	5.0
Lane Grp Cap (vph)	165	1744	617	329	1883	799	365	1473	707	200	1249	426
v/s Ratio Prot	0.01	c0.47		0.06	0.30	0.06	c0.14	c0.41	c0.12	0.06	0.24	
v/s Ratio Perm			0.15			0.38			0.41			0.01
v/c Ratio	0.28	1.23	0.39	0.64	0.69	0.88	1.27	1.20	1.20	1.09	0.83	0.04
Uniform Delay, d1	62.3	41.7	30.1	59.2	31.1	30.3	60.4	44.9	37.9	63.9	45.2	34.9
Progression 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
Incremental Delay, d2	1.9	108.0	0.4	5.7	1.1	11.1	141.9	98.1	104.4	89.7	5.2	0.1
Delay (s)	64.2	149.7	30.5	64.9	32.2	41.4	202.3	143.0	142.3	153.6	50.4	35.0
Level of Service	E	F	C	E	C	D	F	F	F	F	D	D
Approach Delay (s)		131.0			38.3			151.6			66.7	
Approach LOS		F			D			F			E	

Intersection Summary			
HCM 2000 Control Delay	106.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.25		
Actuated Cycle Length (s)	135.8	Sum of lost time (s)	16.4
Intersection Capacity Utilization	114.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

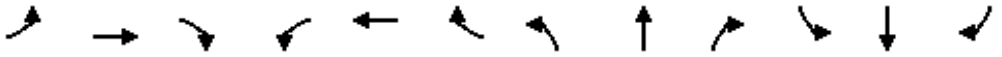


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	124	193	145	373	22	77	1	1868	253	358	2807	130
v/c Ratio	0.39	0.54	0.58	1.14	0.05	0.28	0.01	0.84	0.28	1.04	0.94	0.12
Control Delay	41.0	57.5	19.8	134.6	46.5	2.7	7.0	30.4	5.0	95.0	25.2	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.0	57.5	19.8	134.6	46.5	2.7	7.0	30.4	5.0	95.0	25.2	2.2
Queue Length 50th (m)	23.7	23.1	1.8	~86.9	2.4	0.0	0.1	153.3	6.4	~75.9	209.0	0.9
Queue Length 95th (m)	40.5	35.2	21.5	#152.7	6.4	0.7	0.6	178.0	19.8	#134.2	#326.3	8.5
Internal Link Dist (m)		1074.9			770.5			396.6			272.1	
Turn Bay Length (m)	85.0		85.0	120.0		85.0	170.0		70.0	170.0		70.0
Base Capacity (vph)	319	357	252	327	448	285	154	2216	900	345	2996	1040
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	0.39	0.54	0.58	1.14	0.05	0.27	0.01	0.84	0.28	1.04	0.94	0.13

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.

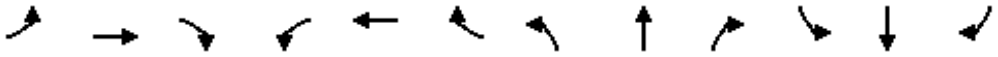


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	124	193	145	373	22	77	1	1868	253	358	2807	130
Future Volume (vph)	124	193	145	373	22	77	1	1868	253	358	2807	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.4	7.4	3.0	5.4	7.4	3.0	3.6	3.6	3.0	3.6	3.6
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	3579	1526	1789	3544	1484	1755	4433	1601	1722	4433	1484
Flt Permitted	0.69	1.00	1.00	0.61	1.00	1.00	0.06	1.00	1.00	0.06	1.00	1.00
Satd. Flow (perm)	1297	3579	1526	1151	3544	1484	119	4433	1601	111	4433	1484
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	124	193	145	373	22	77	1	1868	253	358	2807	130
RTOR Reduction (vph)	0	0	124	0	0	70	0	0	98	0	0	41
Lane Group Flow (vph)	124	193	21	373	22	7	1	1868	155	358	2807	89
Heavy Vehicles (%)	2%	2%	7%	2%	3%	10%	4%	4%	2%	6%	4%	10%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	8		3	4		5	2		1	6	
Permitted Phases	8		8	4		4	2		2	6		6
Actuated Green, G (s)	23.9	11.5	11.5	22.6	10.6	10.6	62.3	61.2	61.2	84.2	79.1	79.1
Effective Green, g (s)	25.9	13.5	11.5	24.6	12.6	10.6	64.3	63.2	63.2	85.2	81.1	81.1
Actuated g/C Ratio	0.21	0.11	0.09	0.20	0.10	0.09	0.52	0.51	0.51	0.68	0.65	0.65
Clearance Time (s)	4.5	7.4	7.4	4.0	7.4	7.4	4.0	5.6	5.6	4.0	5.6	5.6
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	322	387	140	293	358	126	88	2246	811	334	2883	965
v/s Ratio Prot	0.04	0.05		c0.13	0.01		0.00	0.42		c0.17	0.63	
v/s Ratio Perm	0.04		0.01	c0.12		0.00	0.01		0.10	c0.56		0.06
v/c Ratio	0.39	0.50	0.15	1.27	0.06	0.05	0.01	0.83	0.19	1.07	0.97	0.09
Uniform Delay, d1	42.1	52.4	52.1	48.8	50.7	52.4	28.2	26.2	16.8	42.1	20.8	8.1
Progression 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
Incremental Delay, d2	0.8	2.1	1.0	146.8	0.2	0.4	0.1	3.8	0.5	69.7	11.6	0.2
Delay (s)	42.8	54.5	53.1	195.6	50.9	52.8	28.3	30.0	17.3	111.7	32.4	8.3
Level of Service	D	D	D	F	D	D	C	C	B	F	C	A
Approach Delay (s)		50.9			165.6			28.5			40.1	
Approach LOS		D			F			C			D	

Intersection Summary			
HCM 2000 Control Delay	46.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	124.7	Sum of lost time (s)	15.5
Intersection Capacity Utilization	101.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Queues
1: Regional Road 25 & Britannia Road

10-23-2024

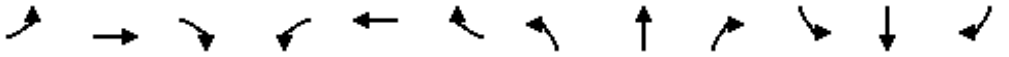


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	303	975	279	483	1159	287	245	1607	611	285	988	341
v/c Ratio	0.81	0.76	0.48	1.04	0.84	0.47	0.66	0.95	0.80	1.01	0.64	0.46
Control Delay	75.1	48.2	16.6	108.2	49.9	18.1	66.4	54.3	29.5	115.7	39.0	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.1	48.2	16.6	108.2	49.9	18.1	66.4	54.3	29.5	115.7	39.0	10.1
Queue Length 50th (m)	41.1	98.5	19.9	~71.7	119.9	24.7	32.5	172.9	87.6	~40.2	92.7	13.4
Queue Length 95th (m)	#61.4	117.3	46.3	#105.9	140.7	51.3	46.5	#210.7	140.0	#69.4	110.6	39.0
Internal Link Dist (m)		239.5			177.4			308.0			325.9	
Turn Bay Length (m)	142.0		89.0	147.0		118.0	120.0		132.0	120.0		115.0
Base Capacity (vph)	383	1312	593	464	1399	610	400	1685	767	283	1555	736
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	0.79	0.74	0.47	1.04	0.83	0.47	0.61	0.95	0.80	1.01	0.64	0.46

Intersection Summary

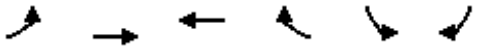
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	303	975	279	483	1159	287	245	1607	611	285	988	341
Future Volume (vph)	303	975	279	483	1159	287	245	1607	611	285	988	341
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	4.6	4.6	3.0	4.6	4.6
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3340	4520	1601	3471	4520	1601	3471	4476	1601	3471	4433	1601
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3340	4520	1601	3471	4520	1601	3471	4476	1601	3471	4433	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	303	975	279	483	1159	287	245	1607	611	285	988	341
RTOR Reduction (vph)	0	0	129	0	0	115	0	0	165	0	0	174
Lane Group Flow (vph)	303	975	150	483	1159	172	245	1607	446	285	988	167
Heavy Vehicles (%)	6%	2%	2%	2%	2%	2%	2%	3%	2%	2%	4%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	14.1	36.3	36.3	17.0	39.2	39.2	13.5	48.6	48.6	10.0	45.1	45.1
Effective Green, g (s)	15.1	38.3	38.3	18.0	41.2	41.2	14.5	50.6	50.6	11.0	47.1	47.1
Actuated g/C Ratio	0.11	0.29	0.29	0.13	0.31	0.31	0.11	0.38	0.38	0.08	0.35	0.35
Clearance Time (s)	4.0	7.8	7.8	4.0	7.8	7.8	4.0	6.6	6.6	4.0	6.6	6.6
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	3.2	3.2	3.0	3.2	3.2
Lane Grp Cap (vph)	375	1289	456	465	1386	491	374	1686	603	284	1554	561
v/s Ratio Prot	0.09	0.22		c0.14	c0.26		c0.07	c0.36		c0.08	0.22	
v/s Ratio Perm			0.09			0.11			0.28			0.10
v/c Ratio	0.81	0.76	0.33	1.04	0.84	0.35	0.66	0.95	0.74	1.00	0.64	0.30
Uniform Delay, d1	58.2	43.7	37.9	58.2	43.4	36.2	57.5	40.7	36.2	61.7	36.4	31.6
Progression 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
Incremental Delay, d2	12.1	2.7	0.6	52.1	4.7	0.6	4.1	12.6	4.9	54.3	0.9	0.3
Delay (s)	70.2	46.5	38.4	110.3	48.2	36.7	61.6	53.3	41.1	115.9	37.3	31.9
Level of Service	E	D	D	F	D	D	E	D	D	F	D	C
Approach Delay (s)		49.7			62.0			51.1			50.1	
Approach LOS		D			E			D			D	

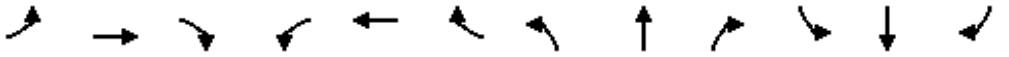
Intersection Summary			
HCM 2000 Control Delay	53.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	134.3	Sum of lost time (s)	16.4
Intersection Capacity Utilization	87.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	286	1602	2012	75	128	93
v/c Ratio	0.91	0.51	0.82	0.08	0.51	0.22
Control Delay	60.6	6.6	19.7	2.2	37.2	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.6	6.6	19.7	2.2	37.2	1.9
Queue Length 50th (m)	27.5	39.3	98.6	0.0	17.9	0.0
Queue Length 95th (m)	#78.7	63.0	141.6	4.8	33.8	1.8
Internal Link Dist (m)		1174.8	1361.6			
Turn Bay Length (m)	130.0			85.0	85.0	85.0
Base Capacity (vph)	315	3144	2444	907	687	856
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	0.91	0.51	0.82	0.08	0.19	0.11

Intersection Summary

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



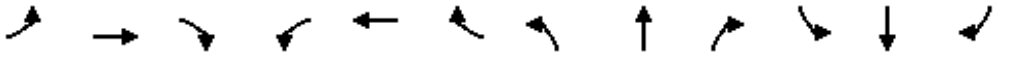
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	286	1602	0	0	2012	75	0	0	0	128	0	93
Future Volume (vph)	286	1602	0	0	2012	75	0	0	0	128	0	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5			4.5	4.5				5.2		5.2
Lane Util. Factor	1.00	*0.80			*0.80	1.00				1.00		1.00
Frt	1.00	1.00			1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1789	4476			4520	1601				1789		1601
Flt Permitted	0.08	1.00			1.00	1.00				0.76		1.00
Satd. Flow (perm)	157	4476			4520	1601				1426		1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	286	1602	0	0	2012	75	0	0	0	128	0	93
RTOR Reduction (vph)	0	0	0	0	0	34	0	0	0	0	0	77
Lane Group Flow (vph)	286	1602	0	0	2012	41	0	0	0	128	0	16
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm				Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	57.1	54.6			41.6	41.6				14.2		14.2
Effective Green, g (s)	58.1	56.6			43.6	43.6				14.2		14.2
Actuated g/C Ratio	0.72	0.70			0.54	0.54				0.18		0.18
Clearance Time (s)	4.0	6.5			6.5	6.5				5.2		5.2
Vehicle Extension (s)	3.0	5.0			5.0	5.0				5.0		5.0
Lane Grp Cap (vph)	316	3147			2448	867				251		282
v/s Ratio Prot	c0.11	0.36			0.45							
v/s Ratio Perm	c0.54					0.03				c0.09		0.01
v/c Ratio	0.91	0.51			0.82	0.05				0.51		0.06
Uniform Delay, d1	24.4	5.5			15.2	8.7				30.0		27.6
Progression Factor	1.00	1.00			1.00	1.00				1.00		1.00
Incremental Delay, d2	27.7	0.3			2.6	0.0				3.4		0.2
Delay (s)	52.0	5.8			17.9	8.7				33.4		27.8
Level of Service	D	A			B	A				C		C
Approach Delay (s)		12.8			17.6			0.0			31.0	
Approach LOS		B			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	80.5	Sum of lost time (s)	10.7
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	332	1232	280	2074	110	62	112	284	230	107
v/c Ratio	0.96	0.41	0.24	0.94	0.64	0.18	0.29	0.90	0.64	0.27
Control Delay	80.1	11.0	1.6	42.3	59.7	47.3	5.2	80.1	59.1	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.1	11.0	1.6	42.3	59.7	47.3	5.2	80.1	59.1	4.4
Queue Length 50th (m)	72.2	56.6	0.0	211.5	23.6	14.2	0.0	67.8	57.6	0.0
Queue Length 95th (m)	#146.0	82.6	10.2	#289.5	39.2	26.7	9.0	#98.7	84.3	7.6
Internal Link Dist (m)		1361.6		653.2		218.8			343.3	
Turn Bay Length (m)	85.0		85.0		85.0		85.0	85.0		85.0
Base Capacity (vph)	347	2990	1171	2217	171	540	537	314	554	548
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.41	0.24	0.94	0.64	0.11	0.21	0.90	0.42	0.20

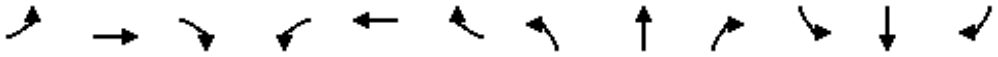
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	332	1232	280	0	2074	0	110	62	112	284	230	107
Future Volume (vph)	332	1232	280	0	2074	0	110	62	112	284	230	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9		4.9		4.5	3.2	5.2	4.5	3.2	5.2
Lane Util. Factor	1.00	*0.80	1.00		*0.80		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	4433	1601		4520		1789	1883	1601	1789	1883	1601
Flt Permitted	0.06	1.00	1.00		1.00		0.30	1.00	1.00	0.66	1.00	1.00
Satd. Flow (perm)	109	4433	1601		4520		557	1883	1601	1250	1883	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	332	1232	280	0	2074	0	110	62	112	284	230	107
RTOR Reduction (vph)	0	0	91	0	0	0	0	0	93	0	0	88
Lane Group Flow (vph)	332	1232	189	0	2074	0	110	62	19	284	230	19
Heavy Vehicles (%)	2%	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	89.9	89.9	89.9		64.9		28.7	23.0	23.0	30.7	24.0	24.0
Effective Green, g (s)	90.9	91.9	91.9		66.9		28.7	25.0	23.0	30.7	26.0	24.0
Actuated g/C Ratio	0.67	0.67	0.67		0.49		0.21	0.18	0.17	0.23	0.19	0.18
Clearance Time (s)	4.0	6.9	6.9		6.9		4.5	5.2	5.2	4.5	5.2	5.2
Vehicle Extension (s)	3.0	5.0	5.0		5.0		3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	344	2991	1080		2220		168	345	270	308	359	282
v/s Ratio Prot	c0.16	0.28			0.46		0.03	0.03		c0.05	0.12	
v/s Ratio Perm	c0.49		0.12				0.11		0.01	c0.16		0.01
v/c Ratio	0.97	0.41	0.17		0.93		0.65	0.18	0.07	0.92	0.64	0.07
Uniform Delay, d1	46.8	10.0	8.2		32.6		47.8	46.9	47.6	51.1	50.8	46.8
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	38.9	0.2	0.2		8.4		8.8	0.5	0.2	31.7	5.3	0.2
Delay (s)	85.7	10.2	8.3		40.9		56.7	47.5	47.8	82.8	56.1	47.0
Level of Service	F	B	A		D		E	D	D	F	E	D
Approach Delay (s)		23.5			40.9			51.2			66.7	
Approach LOS		C			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	38.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	136.2	Sum of lost time (s)	15.6
Intersection Capacity Utilization	96.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

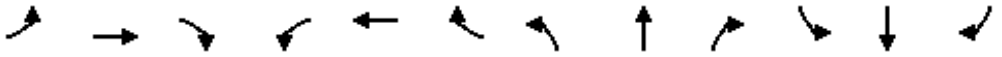


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	323	1003	302	408	1634	210	462	1533	91	257	1603	486
v/c Ratio	1.03	0.77	0.48	0.84	1.06	0.32	1.05	0.91	0.14	0.91	1.09	0.75
Control Delay	119.4	49.8	14.2	74.8	83.7	10.1	113.6	51.0	2.4	98.3	95.0	32.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	119.4	49.8	14.2	74.8	83.7	10.1	113.6	51.0	2.4	98.3	95.0	32.7
Queue Length 50th (m)	~49.0	106.2	17.1	57.3	~206.0	8.8	~71.4	167.1	0.0	37.0	~207.1	74.9
Queue Length 95th (m)	#79.5	125.7	44.2	#79.9	#239.5	27.6	#105.5	191.6	5.8	#62.3	#240.6	118.7
Internal Link Dist (m)		653.2			686.5			2451.0			163.2	
Turn Bay Length (m)	130.0		85.0	85.0		95.0	85.0		85.0	230.0		85.0
Base Capacity (vph)	314	1311	624	495	1546	655	441	1682	671	282	1475	652
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	1.03	0.77	0.48	0.82	1.06	0.32	1.05	0.91	0.14	0.91	1.09	0.75

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.



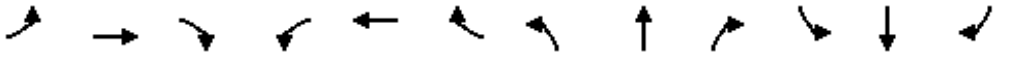
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	323	1003	302	408	1634	210	462	1533	91	257	1603	486
Future Volume (vph)	323	1003	302	408	1634	210	462	1533	91	257	1603	486
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.4	5.4	3.0	5.4	5.4
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3471	4476	1601	3471	4520	1601	3471	4520	1601	3471	4520	1601
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3471	4476	1601	3471	4520	1601	3471	4520	1601	3471	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	323	1003	302	408	1634	210	462	1533	91	257	1603	486
RTOR Reduction (vph)	0	0	156	0	0	107	0	0	57	0	0	130
Lane Group Flow (vph)	323	1003	146	408	1634	103	462	1533	34	257	1603	356
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	11.7	39.0	39.0	18.6	45.9	45.9	16.8	50.1	50.1	10.4	43.7	43.7
Effective Green, g (s)	12.7	41.0	41.0	19.6	47.9	47.9	17.8	52.1	52.1	11.4	45.7	45.7
Actuated g/C Ratio	0.09	0.29	0.29	0.14	0.34	0.34	0.13	0.37	0.37	0.08	0.33	0.33
Clearance Time (s)	4.0	6.5	6.5	4.0	6.5	6.5	4.0	7.4	7.4	4.0	7.4	7.4
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	5.0	5.0
Lane Grp Cap (vph)	314	1310	468	485	1546	547	441	1682	595	282	1475	522
v/s Ratio Prot	c0.09	0.22		c0.12	c0.36		c0.13	0.34		0.07	c0.35	
v/s Ratio Perm			0.09			0.06			0.02			0.22
v/c Ratio	1.03	0.77	0.31	0.84	1.06	0.19	1.05	0.91	0.06	0.91	1.09	0.68
Uniform Delay, d1	63.6	45.1	38.5	58.7	46.0	32.4	61.1	41.8	28.2	63.8	47.1	40.9
Progression 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
Incremental Delay, d2	58.4	3.2	0.8	12.5	39.6	0.3	55.9	7.9	0.0	31.4	50.8	4.7
Delay (s)	122.0	48.3	39.3	71.1	85.6	32.7	117.0	49.6	28.2	95.2	97.9	45.6
Level of Service	F	D	D	E	F	C	F	D	C	F	F	D
Approach Delay (s)		61.3			78.1			63.6			86.8	
Approach LOS		E			E			E			F	

Intersection Summary			
HCM 2000 Control Delay	73.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.9
Intersection Capacity Utilization	99.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	176	1124	50	169	1800	187	32	93	189	255	420
v/c Ratio	0.80	0.54	0.07	0.63	0.85	0.22	0.12	0.15	0.46	0.45	0.77
Control Delay	45.8	19.5	2.4	22.6	28.3	3.4	21.9	18.8	28.0	26.1	28.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.8	19.5	2.4	22.6	28.3	3.4	21.9	18.8	28.0	26.1	28.2
Queue Length 50th (m)	16.0	59.2	0.0	13.1	119.2	0.0	3.9	10.1	26.1	34.7	44.7
Queue Length 95th (m)	#56.7	83.7	4.1	#31.1	#175.5	12.0	10.3	20.2	44.6	55.0	78.6
Internal Link Dist (m)		686.5			658.0			300.4		386.3	
Turn Bay Length (m)	125.0		85.0	135.0		85.0	122.0				85.0
Base Capacity (vph)	219	2071	743	269	2112	847	365	796	549	750	687
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.54	0.07	0.63	0.85	0.22	0.09	0.12	0.34	0.34	0.61

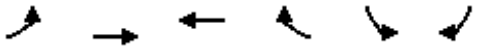
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	176	1124	50	169	1800	187	32	79	14	189	255	420
Future Volume (vph)	176	1124	50	169	1800	187	32	79	14	189	255	420
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.5	3.5		4.5	3.5	5.5
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1659	4350	1484	1789	4520	1601	1789	1841		1789	1746	1484
Flt Permitted	0.09	1.00	1.00	0.15	1.00	1.00	0.46	1.00		0.70	1.00	1.00
Satd. Flow (perm)	164	4350	1484	279	4520	1601	873	1841		1312	1746	1484
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	176	1124	50	169	1800	187	32	79	14	189	255	420
RTOR Reduction (vph)	0	0	26	0	0	100	0	7	0	0	0	96
Lane Group Flow (vph)	176	1124	24	169	1800	87	32	86	0	189	255	324
Heavy Vehicles (%)	10%	6%	10%	2%	2%	2%	2%	2%	2%	2%	10%	10%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	48.3	41.6	41.6	46.7	40.8	40.8	28.0	28.0		28.0	28.0	28.0
Effective Green, g (s)	50.3	43.6	43.6	48.7	42.8	42.8	29.0	30.0		29.0	30.0	28.0
Actuated g/C Ratio	0.55	0.48	0.48	0.53	0.47	0.47	0.32	0.33		0.32	0.33	0.31
Clearance Time (s)	4.0	6.5	6.5	4.0	6.5	6.5	5.5	5.5		5.5	5.5	5.5
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	5.0	5.0		5.0	5.0	5.0
Lane Grp Cap (vph)	215	2072	707	262	2114	748	276	603		415	572	454
v/s Ratio Prot	c0.07	0.26		0.05	c0.40			0.05			0.15	
v/s Ratio Perm	0.38		0.02	0.29		0.05	0.04			0.14		c0.22
v/c Ratio	0.82	0.54	0.03	0.65	0.85	0.12	0.12	0.14		0.46	0.45	0.71
Uniform Delay, d1	19.3	16.9	12.7	12.3	21.5	13.7	22.2	21.7		24.9	24.2	28.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	20.9	0.4	0.0	5.4	3.7	0.1	0.4	0.2		1.7	1.2	6.5
Delay (s)	40.2	17.3	12.8	17.7	25.2	13.8	22.6	21.9		26.6	25.4	34.6
Level of Service	D	B	B	B	C	B	C	C		C	C	C
Approach Delay (s)		20.1			23.6			22.1			30.1	
Approach LOS		C			C			C			C	

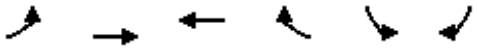
Intersection Summary			
HCM 2000 Control Delay	23.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	91.5	Sum of lost time (s)	11.0
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	131	1197	1822	415	438	334
v/c Ratio	0.48	0.44	0.87	0.46	0.41	0.53
Control Delay	12.7	8.7	22.8	3.5	17.8	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.7	8.7	22.8	3.5	17.8	11.1
Queue Length 50th (m)	6.3	25.3	66.5	0.0	19.6	11.8
Queue Length 95th (m)	12.9	33.5	#97.2	14.2	30.5	31.8
Internal Link Dist (m)		658.0	685.0		264.0	
Turn Bay Length (m)	125.0			85.0		
Base Capacity (vph)	273	2934	2089	896	1080	631
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	0.48	0.41	0.87	0.46	0.41	0.53

Intersection Summary

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



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	131	1197	1822	415	438	334
Future Volume (vph)	131	1197	1822	415	438	334
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1789	5142	5142	1601	3471	1601
Flt Permitted	0.14	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	268	5142	5142	1601	3471	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	131	1197	1822	415	438	334
RTOR Reduction (vph)	0	0	0	249	0	134
Lane Group Flow (vph)	131	1197	1822	166	438	200
Turn Type	pm+pt	NA	NA	Perm	Perm	Perm
Protected Phases	7	4	8			
Permitted Phases	4			8	6	6
Actuated Green, G (s)	32.0	32.0	23.6	23.6	18.1	18.1
Effective Green, g (s)	32.0	32.0	23.6	23.6	18.1	18.1
Actuated g/C Ratio	0.54	0.54	0.40	0.40	0.31	0.31
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	245	2784	2053	639	1063	490
v/s Ratio Prot	0.04	c0.23	c0.35			
v/s Ratio Perm	0.25			0.10	c0.13	0.12
v/c Ratio	0.53	0.43	0.89	0.26	0.41	0.41
Uniform Delay, d1	10.9	8.1	16.5	11.9	16.3	16.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2	0.1	5.1	0.2	1.2	2.5
Delay (s)	13.2	8.2	21.6	12.1	17.5	18.8
Level of Service	B	A	C	B	B	B
Approach Delay (s)		8.7	19.8		18.0	
Approach LOS		A	B		B	

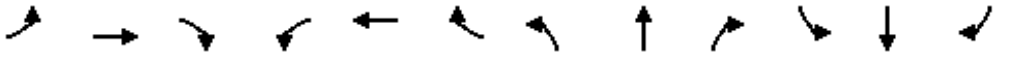
Intersection Summary			
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	59.1	Sum of lost time (s)	13.5
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	17	1450	168	15	2029	490	106	213	296	356	102
v/c Ratio	0.10	0.68	0.20	0.08	0.88	0.50	0.76	0.24	0.87	0.70	0.21
Control Delay	14.4	25.1	3.8	14.2	32.6	8.1	86.5	32.6	76.8	45.4	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.4	25.1	3.8	14.2	32.6	8.1	86.5	32.6	76.8	45.4	7.4
Queue Length 50th (m)	1.6	87.0	0.1	1.4	144.5	14.8	22.0	17.6	31.8	66.6	0.0
Queue Length 95th (m)	5.7	153.2	12.8	5.2	#263.7	54.4	#61.8	30.3	#69.7	108.5	12.7
Internal Link Dist (m)		685.0			1030.1			436.1		413.0	
Turn Bay Length (m)	85.0		85.0	85.0		85.0	85.0		85.0		85.0
Base Capacity (vph)	177	2127	856	186	2294	983	139	1233	341	693	627
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.68	0.20	0.08	0.88	0.50	0.76	0.17	0.87	0.51	0.16

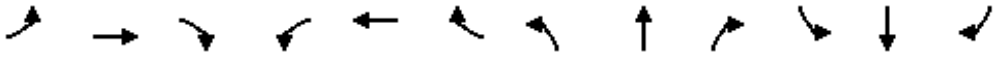
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	1450	168	15	2029	490	106	189	24	296	356	102
Future Volume (vph)	17	1450	168	15	2029	490	106	189	24	296	356	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.5	3.2		4.5	3.2	5.2
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	0.95		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1659	4192	1526	1690	4520	1601	1772	3518		3471	1883	1601
Flt Permitted	0.07	1.00	1.00	0.08	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	124	4192	1526	138	4520	1601	1772	3518		3471	1883	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	17	1450	168	15	2029	490	106	189	24	296	356	102
RTOR Reduction (vph)	0	0	84	0	0	175	0	8	0	0	0	77
Lane Group Flow (vph)	17	1450	84	15	2029	315	106	205	0	296	356	25
Heavy Vehicles (%)	10%	10%	7%	8%	2%	2%	3%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6						4
Actuated Green, G (s)	58.0	55.5	55.5	58.0	55.5	55.5	8.9	26.4		11.1	28.6	28.6
Effective Green, g (s)	60.0	57.5	57.5	60.0	57.5	57.5	8.9	28.4		11.1	30.6	28.6
Actuated g/C Ratio	0.52	0.50	0.50	0.52	0.50	0.50	0.08	0.25		0.10	0.26	0.25
Clearance Time (s)	4.0	6.5	6.5	4.0	6.5	6.5	4.5	5.2		4.5	5.2	5.2
Vehicle Extension (s)	2.5	5.0	5.0	2.5	5.0	5.0	3.0	5.0		3.0	5.0	5.0
Lane Grp Cap (vph)	110	2083	758	118	2246	795	136	863		333	498	395
v/s Ratio Prot	c0.00	0.35		0.00	c0.45		0.06	0.06		c0.09	c0.19	
v/s Ratio Perm	0.08		0.06	0.06		0.20						0.02
v/c Ratio	0.15	0.70	0.11	0.13	0.90	0.40	0.78	0.24		0.89	0.71	0.06
Uniform Delay, d1	23.3	22.4	15.5	16.4	26.6	18.2	52.4	35.0		51.7	38.6	33.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	1.3	0.1	0.4	5.9	0.7	24.0	0.3		23.7	6.0	0.1
Delay (s)	23.8	23.7	15.6	16.7	32.5	18.9	76.5	35.3		75.4	44.6	33.5
Level of Service	C	C	B	B	C	B	E	D		E	D	C
Approach Delay (s)		22.9			29.8			49.0			55.2	
Approach LOS		C			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	32.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	115.7	Sum of lost time (s)	15.2
Intersection Capacity Utilization	74.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

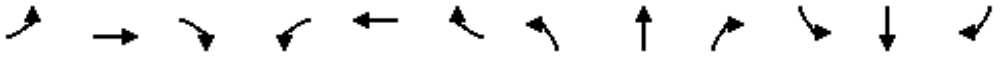


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	67	1181	571	411	1909	717	524	1752	280	278	1507	157
v/c Ratio	0.44	0.87	0.87	0.96	1.07	0.82	1.04	1.03	0.40	0.97	1.06	0.27
Control Delay	76.5	55.7	42.4	95.9	83.1	35.0	110.5	73.7	15.5	110.8	88.0	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.5	55.7	42.4	95.9	83.1	35.0	110.5	73.7	15.5	110.8	88.0	7.1
Queue Length 50th (m)	9.8	133.9	97.7	61.3	~258.6	155.1	~83.7	~223.7	24.0	41.7	~197.3	1.4
Queue Length 95th (m)	18.0	155.7	#164.5	#93.1	#291.1	217.1	#119.6	#256.9	47.8	#70.7	#231.1	17.4
Internal Link Dist (m)		309.3			173.0			421.7			476.7	
Turn Bay Length (m)	50.0		70.0	90.0		70.0	165.0		70.0	140.0		70.0
Base Capacity (vph)	154	1362	655	430	1791	875	502	1701	705	287	1424	592
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	0.44	0.87	0.87	0.96	1.07	0.82	1.04	1.03	0.40	0.97	1.06	0.27

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.



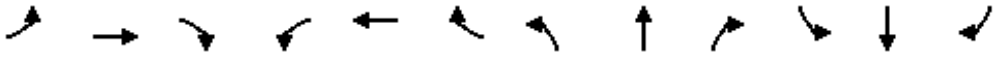
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	1181	571	411	1909	717	524	1752	280	278	1507	157
Future Volume (vph)	67	1181	571	411	1909	717	524	1752	280	278	1507	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	2.0	3.0	4.9	4.9	3.0	4.9	4.9
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3437	4476	1601	3471	4520	1601	3471	4476	1601	3471	4476	1541
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3437	4476	1601	3471	4520	1601	3471	4476	1601	3471	4476	1541
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	67	1181	571	411	1909	717	524	1752	280	278	1507	157
RTOR Reduction (vph)	0	0	168	0	0	47	0	0	98	0	0	103
Lane Group Flow (vph)	67	1181	403	411	1909	670	524	1752	182	278	1507	54
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%	2%	3%	2%	2%	3%	6%
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	4.4	42.8	42.8	17.0	55.4	66.4	20.0	53.1	53.1	11.0	44.1	44.1
Effective Green, g (s)	5.4	44.8	44.8	18.0	57.4	70.4	21.0	55.1	55.1	12.0	46.1	46.1
Actuated g/C Ratio	0.04	0.31	0.31	0.12	0.39	0.48	0.14	0.38	0.38	0.08	0.32	0.32
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	4.0	4.0	6.9	6.9	4.0	6.9	6.9
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	127	1376	492	428	1780	773	500	1692	605	285	1416	487
v/s Ratio Prot	0.02	0.26		c0.12	c0.42	0.08	c0.15	c0.39		0.08	0.34	
v/s Ratio Perm			0.25			0.34			0.11			0.04
v/c Ratio	0.53	0.86	0.82	0.96	1.07	0.87	1.05	1.04	0.30	0.98	1.06	0.11
Uniform Delay, d1	68.9	47.5	46.7	63.5	44.1	33.5	62.3	45.3	31.8	66.7	49.8	35.3
Progression 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
Incremental Delay, d2	3.9	5.7	10.8	33.3	43.8	10.1	53.4	31.6	1.3	46.1	43.1	0.5
Delay (s)	72.8	53.2	57.5	96.8	87.9	43.6	115.7	76.9	33.1	112.8	92.9	35.8
Level of Service	E	D	E	F	F	D	F	E	C	F	F	D
Approach Delay (s)		55.3			78.6			80.1			91.1	
Approach LOS		E			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	77.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	145.7	Sum of lost time (s)	15.8
Intersection Capacity Utilization	100.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Queues

11: James Snow Parkway S & Louis St. Laurent Avenue

10-23-2024

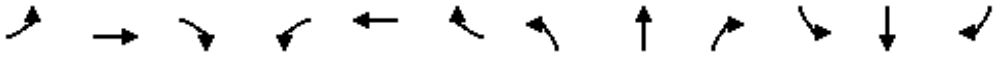


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	216	920	216	333	1334	133	337	1527	202	229	1798	229
v/c Ratio	0.51	0.74	0.34	0.71	1.04	0.20	1.64	0.98	0.31	1.12	1.15	0.36
Control Delay	60.6	43.2	15.6	65.1	78.3	6.6	348.4	62.1	12.3	154.0	116.6	15.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.6	43.2	15.6	65.1	78.3	6.6	348.4	62.1	12.3	154.0	116.6	15.5
Queue Length 50th (m)	27.3	113.5	17.6	42.6	~202.3	1.7	~63.8	158.9	10.3	~34.0	~222.2	16.3
Queue Length 95th (m)	43.0	140.2	38.0	63.9	#245.3	15.2	#105.0	#232.1	32.0	#68.2	#298.9	42.2
Internal Link Dist (m)		214.6			322.8			302.9			114.0	
Turn Bay Length (m)	85.0		140.0	85.0		85.0	115.0		85.0	85.0		85.0
Base Capacity (vph)	756	1439	716	537	1283	652	205	1560	645	205	1560	641
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	0.29	0.64	0.30	0.62	1.04	0.20	1.64	0.98	0.31	1.12	1.15	0.36

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.



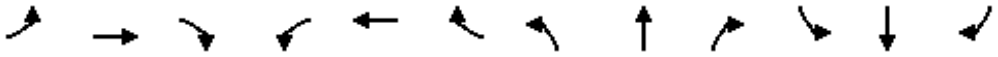
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	216	920	216	333	1334	133	337	1527	202	229	1798	229
Future Volume (vph)	216	920	216	333	1334	133	337	1527	202	229	1798	229
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.8	3.8	3.0	3.8	3.8	3.0	5.4	5.4	3.0	5.4	5.4
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3404	3579	1601	3471	3579	1601	3471	4520	1601	3471	4520	1601
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3404	3579	1601	3471	3579	1601	3471	4520	1601	3471	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	216	920	216	333	1334	133	337	1527	202	229	1798	229
RTOR Reduction (vph)	0	0	79	0	0	79	0	0	93	0	0	89
Lane Group Flow (vph)	216	920	137	333	1334	54	337	1527	109	229	1798	140
Heavy Vehicles (%)	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	15.8	45.0	45.0	17.3	46.5	46.5	7.0	44.7	44.7	7.0	44.7	44.7
Effective Green, g (s)	16.8	47.0	47.0	18.3	48.5	48.5	8.0	46.7	46.7	8.0	46.7	46.7
Actuated g/C Ratio	0.12	0.35	0.35	0.14	0.36	0.36	0.06	0.35	0.35	0.06	0.35	0.35
Clearance Time (s)	4.0	5.8	5.8	4.0	5.8	5.8	4.0	7.4	7.4	4.0	7.4	7.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	422	1244	556	469	1283	574	205	1561	553	205	1561	553
v/s Ratio Prot	0.06	0.26		c0.10	c0.37		c0.10	0.34		0.07	c0.40	
v/s Ratio Perm			0.09			0.03			0.07			0.09
v/c Ratio	0.51	0.74	0.25	0.71	1.04	0.09	1.64	0.98	0.20	1.12	1.15	0.25
Uniform Delay, d1	55.4	38.7	31.5	55.9	43.3	28.8	63.6	43.7	31.1	63.6	44.2	31.7
Progression 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
Incremental Delay, d2	1.1	2.3	0.2	5.0	36.1	0.1	310.7	17.8	0.4	97.8	76.2	0.5
Delay (s)	56.4	41.1	31.7	60.9	79.4	28.8	374.3	61.6	31.4	161.4	120.4	32.2
Level of Service	E	D	C	E	E	C	F	E	C	F	F	C
Approach Delay (s)		42.0			72.3			109.6			115.6	
Approach LOS		D			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	90.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	135.2	Sum of lost time (s)	15.2
Intersection Capacity Utilization	108.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	137	13	314	96	213	219	1770	244	67	1786	461
v/c Ratio	0.80	0.04	0.75	0.35	0.50	0.79	0.71	0.25	0.31	0.81	0.46
Control Delay	61.5	24.2	29.1	30.0	15.7	37.8	16.8	2.5	9.9	21.7	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.5	24.2	29.1	30.0	15.7	37.8	16.8	2.5	9.9	21.7	3.5
Queue Length 50th (m)	19.6	1.6	26.0	12.4	10.8	15.5	79.1	0.0	2.7	87.5	1.4
Queue Length 95th (m)	38.5	5.7	52.1	24.7	28.4	#60.6	126.9	11.5	8.8	#140.9	18.1
Internal Link Dist (m)		483.8			361.2		451.9			2451.0	
Turn Bay Length (m)	85.0		85.0	85.0		85.0		85.0	85.0		85.0
Base Capacity (vph)	411	887	822	665	843	276	2499	994	214	2218	1010
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.01	0.38	0.14	0.25	0.79	0.71	0.25	0.31	0.81	0.46

Intersection Summary

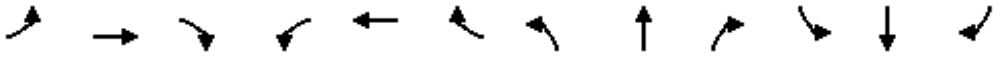
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	137	13	314	96	34	179	219	1770	244	67	1786	461
Future Volume (vph)	137	13	314	96	34	179	219	1770	244	67	1786	461
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6		4.5	7.6	7.6	4.5	7.6	7.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	1883	1601	1789	1646		1789	4520	1601	1789	4520	1601
Flt Permitted	0.46	1.00	1.00	0.75	1.00		0.09	1.00	1.00	0.10	1.00	1.00
Satd. Flow (perm)	872	1883	1601	1411	1646		173	4520	1601	190	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	137	13	314	96	34	179	219	1770	244	67	1786	461
RTOR Reduction (vph)	0	0	102	0	103	0	0	0	111	0	0	222
Lane Group Flow (vph)	137	13	212	96	110	0	219	1770	133	67	1786	239
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	15.5	15.5	15.5	15.5	15.5		51.4	43.6	43.6	43.6	39.7	39.7
Effective Green, g (s)	15.5	15.5	15.5	15.5	15.5		51.4	43.6	43.6	43.6	39.7	39.7
Actuated g/C Ratio	0.19	0.19	0.19	0.19	0.19		0.64	0.55	0.55	0.55	0.50	0.50
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6		4.5	7.6	7.6	4.5	7.6	7.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	169	366	311	274	320		269	2472	875	182	2251	797
v/s Ratio Prot		0.01			0.07		c0.08	0.39		0.02	0.40	
v/s Ratio Perm	c0.16		0.13	0.07			c0.44		0.08	0.18		0.15
v/c Ratio	0.81	0.04	0.68	0.35	0.34		0.81	0.72	0.15	0.37	0.79	0.30
Uniform Delay, d1	30.7	26.0	29.8	27.7	27.7		17.3	13.4	8.9	10.0	16.6	11.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	24.6	0.0	6.0	0.8	0.6		17.0	1.8	0.4	1.3	3.0	1.0
Delay (s)	55.3	26.1	35.8	28.5	28.4		34.3	15.3	9.3	11.3	19.6	12.8
Level of Service	E	C	D	C	C		C	B	A	B	B	B
Approach Delay (s)		41.3			28.4			16.5			18.0	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	79.7	Sum of lost time (s)	16.7
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

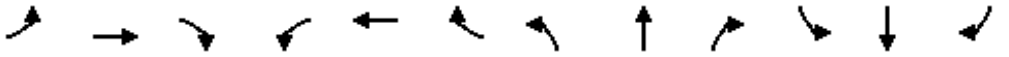


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	140	1308	464	414	2205	643	361	1287	380	338	1608	116
v/c Ratio	0.79	0.84	0.69	0.87	1.14	0.80	1.26	0.94	0.59	1.01	1.12	0.19
Control Delay	96.7	50.0	30.3	79.8	107.2	32.7	192.7	62.6	20.5	115.3	109.9	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	96.7	50.0	30.3	79.8	107.2	32.7	192.7	62.6	20.5	115.3	109.9	5.3
Queue Length 50th (m)	20.8	144.3	71.8	60.8	~306.5	114.4	~66.7	150.2	36.6	~51.4	~221.2	0.0
Queue Length 95th (m)	#38.1	166.5	112.9	#87.0	#337.8	169.6	#98.6	#183.0	70.5	#83.6	#254.7	11.8
Internal Link Dist (m)		888.5			759.7			657.0			690.8	
Turn Bay Length (m)	130.0		110.0	300.0		70.0	110.0		70.0	130.0		85.0
Base Capacity (vph)	177	1549	671	478	1938	803	287	1370	647	335	1432	598
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	0.79	0.84	0.69	0.87	1.14	0.80	1.26	0.94	0.59	1.01	1.12	0.19

Intersection Summary

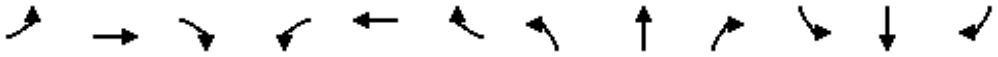
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	1308	464	414	2205	643	361	1287	380	338	1608	116
Future Volume (vph)	140	1308	464	414	2205	643	361	1287	380	338	1608	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	4.6	4.6	3.0	4.6	4.6
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3219	4476	1601	3471	4520	1601	3471	4476	1601	3471	4476	1601
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3219	4476	1601	3471	4520	1601	3471	4476	1601	3471	4476	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	140	1308	464	414	2205	643	361	1287	380	338	1608	116
RTOR Reduction (vph)	0	0	118	0	0	117	0	0	157	0	0	79
Lane Group Flow (vph)	140	1308	346	414	2205	526	361	1287	223	338	1608	37
Heavy Vehicles (%)	10%	3%	2%	2%	2%	2%	2%	3%	2%	2%	3%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	7.0	48.2	48.2	19.0	60.2	60.2	11.0	42.4	42.4	13.0	44.4	44.4
Effective Green, g (s)	8.0	50.2	50.2	20.0	62.2	62.2	12.0	44.4	44.4	14.0	46.4	46.4
Actuated g/C Ratio	0.06	0.35	0.35	0.14	0.43	0.43	0.08	0.31	0.31	0.10	0.32	0.32
Clearance Time (s)	4.0	7.8	7.8	4.0	7.8	7.8	4.0	6.6	6.6	4.0	6.6	6.6
Vehicle Extension (s)	5.0	3.0	3.0	5.0	3.0	3.0	4.0	5.0	5.0	4.0	5.0	5.0
Lane Grp Cap (vph)	177	1549	554	478	1938	686	287	1370	490	335	1432	512
v/s Ratio Prot	0.04	0.29		c0.12	c0.49		c0.10	0.29		0.10	c0.36	
v/s Ratio Perm			0.22			0.33			0.14			0.02
v/c Ratio	0.79	0.84	0.63	0.87	1.14	0.77	1.26	0.94	0.46	1.01	1.12	0.07
Uniform Delay, d1	67.7	43.8	39.5	61.2	41.4	35.2	66.5	49.0	40.6	65.5	49.3	34.3
Progression 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
Incremental Delay, d2	23.7	4.4	2.2	16.3	68.9	5.1	141.2	12.9	1.4	51.4	65.1	0.1
Delay (s)	91.3	48.2	41.8	77.5	110.3	40.4	207.7	61.9	42.0	116.9	114.4	34.4
Level of Service	F	D	D	E	F	D	F	E	D	F	F	C
Approach Delay (s)		49.8			92.4			84.1			110.3	
Approach LOS		D			F			F			F	

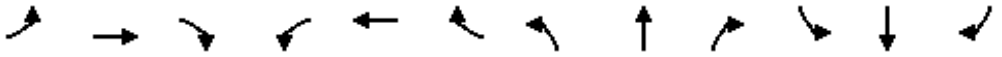
Intersection Summary			
HCM 2000 Control Delay	85.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	105.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	86	61	14	296	168	379	160	2484	310	196	1875	85
v/c Ratio	0.38	0.16	0.06	0.95	0.35	0.81	0.65	0.92	0.24	0.88	0.71	0.09
Control Delay	39.2	45.6	0.4	81.3	44.9	45.4	31.9	27.1	1.0	63.9	18.9	0.8
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	39.2	45.6	0.4	81.3	44.9	45.4	31.9	27.1	1.0	63.9	18.9	0.8
Queue Length 50th (m)	14.7	6.3	0.0	57.3	17.4	63.3	16.4	194.1	0.0	26.2	120.5	0.0
Queue Length 95th (m)	27.8	12.7	0.0	#112.5	27.7	#110.1	37.7	#233.0	6.8	#69.0	143.7	2.5
Internal Link Dist (m)		1074.9			770.5			396.6			272.1	
Turn Bay Length (m)	85.0		85.0	120.0		85.0	170.0		70.0	170.0		70.0
Base Capacity (vph)	228	392	249	310	507	468	278	2700	1268	222	2635	986
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	0.38	0.16	0.06	0.95	0.33	0.81	0.58	0.92	0.24	0.88	0.71	0.09

Intersection Summary

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

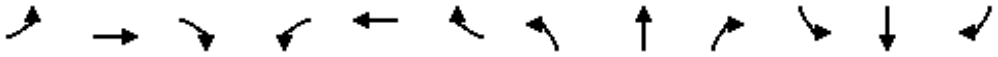


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	61	14	296	168	379	160	2484	310	196	1875	85
Future Volume (vph)	86	61	14	296	168	379	160	2484	310	196	1875	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.4	7.4	3.0	5.4	4.0	3.0	3.6	2.0	3.0	3.6	3.6
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	3510	1601	1789	3579	1601	1789	4520	1601	1789	4520	1601
Flt Permitted	0.65	1.00	1.00	0.53	1.00	1.00	0.06	1.00	1.00	0.06	1.00	1.00
Satd. Flow (perm)	1216	3510	1601	1005	3579	1601	119	4520	1601	122	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	86	61	14	296	168	379	160	2484	310	196	1875	85
RTOR Reduction (vph)	0	0	13	0	0	56	0	0	93	0	0	36
Lane Group Flow (vph)	86	61	1	296	168	323	160	2484	217	196	1875	49
Heavy Vehicles (%)	2%	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	Perm
Protected Phases	7	8		3	4	1	5	2	3	1	6	
Permitted Phases	8		8	4		4	2		2	6		6
Actuated Green, G (s)	11.9	7.8	7.8	21.8	13.2	21.2	71.8	62.2	72.2	68.6	60.6	60.6
Effective Green, g (s)	13.9	9.8	7.8	22.8	15.2	21.2	73.8	64.2	76.2	70.6	62.6	62.6
Actuated g/C Ratio	0.13	0.09	0.07	0.21	0.14	0.19	0.68	0.59	0.70	0.65	0.57	0.57
Clearance Time (s)	4.5	7.4	7.4	4.0	7.4	4.0	4.0	5.6	4.0	4.0	5.6	5.6
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	3.0	3.0	5.0	5.0
Lane Grp Cap (vph)	181	315	114	289	499	311	242	2662	1119	216	2595	919
v/s Ratio Prot	0.02	0.02		c0.10	0.05	c0.08	c0.06	c0.55	0.02	0.07	0.41	
v/s Ratio Perm	0.04		0.00	c0.11		0.13	0.38		0.11	0.51		0.03
v/c Ratio	0.48	0.19	0.01	1.02	0.34	1.04	0.66	0.93	0.19	0.91	0.72	0.05
Uniform Delay, d1	43.6	45.9	47.0	42.0	42.3	43.9	24.0	20.4	5.7	33.4	16.9	10.2
Progression 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
Incremental Delay, d2	2.0	0.6	0.1	59.3	0.8	61.1	6.6	7.5	0.1	36.5	1.8	0.1
Delay (s)	45.5	46.6	47.1	101.3	43.2	105.0	30.6	28.0	5.8	69.9	18.7	10.3
Level of Service	D	D	D	F	D	F	C	C	A	E	B	B
Approach Delay (s)		46.1			91.4			25.8			23.0	
Approach LOS		D			F			C			C	

Intersection Summary			
HCM 2000 Control Delay	34.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	109.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	98.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Queues
1: Regional Road 25 & Britannia Road

10-23-2024



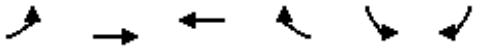
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	264	1094	178	355	898	71	298	904	408	273	1196	148
v/c Ratio	0.67	0.83	0.30	0.84	0.66	0.13	0.74	0.61	0.57	0.69	0.81	0.25
Control Delay	64.5	50.0	6.3	73.9	43.3	3.8	68.6	38.1	15.0	65.9	44.7	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.5	50.0	6.3	73.9	43.3	3.8	68.6	38.1	15.0	65.9	44.7	5.8
Queue Length 50th (m)	35.0	114.0	0.0	48.4	88.4	0.0	40.1	82.7	27.9	36.4	119.4	0.0
Queue Length 95th (m)	49.4	134.6	16.8	#72.3	106.4	6.8	55.8	99.5	60.7	51.2	140.3	14.4
Internal Link Dist (m)		239.5			177.4			308.0			325.9	
Turn Bay Length (m)	142.0		89.0	147.0		118.0	120.0		132.0	120.0		115.0
Base Capacity (vph)	436	1363	607	436	1377	553	419	1567	733	427	1567	625
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	0.61	0.80	0.29	0.81	0.65	0.13	0.71	0.58	0.56	0.64	0.76	0.24

Intersection Summary

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

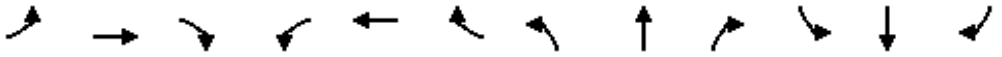
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	264	1094	178	355	898	71	298	904	408	273	1196	148
Future Volume (vph)	264	1094	178	355	898	71	298	904	408	273	1196	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	4.6	4.6	3.0	4.6	4.6
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3340	4520	1601	3340	4520	1601	3404	4391	1570	3471	4391	1484
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3340	4520	1601	3340	4520	1601	3404	4391	1570	3471	4391	1484
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	264	1094	178	355	898	71	298	904	408	273	1196	148
RTOR Reduction (vph)	0	0	126	0	0	50	0	0	178	0	0	98
Lane Group Flow (vph)	264	1094	52	355	898	21	298	904	230	273	1196	50
Heavy Vehicles (%)	6%	2%	2%	6%	2%	2%	4%	5%	4%	2%	5%	10%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	14.5	36.1	36.1	15.6	37.2	37.2	14.4	42.3	42.3	14.0	41.9	41.9
Effective Green, g (s)	15.5	38.1	38.1	16.6	39.2	39.2	15.4	44.3	44.3	15.0	43.9	43.9
Actuated g/C Ratio	0.12	0.29	0.29	0.13	0.30	0.30	0.12	0.34	0.34	0.12	0.34	0.34
Clearance Time (s)	4.0	7.8	7.8	4.0	7.8	7.8	4.0	6.6	6.6	4.0	6.6	6.6
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	3.2	3.2	3.0	3.2	3.2
Lane Grp Cap (vph)	397	1320	467	425	1358	481	402	1491	533	399	1478	499
v/s Ratio Prot	0.08	c0.24		c0.11	0.20		c0.09	0.21		0.08	c0.27	
v/s Ratio Perm			0.03			0.01			0.15			0.03
v/c Ratio	0.66	0.83	0.11	0.84	0.66	0.04	0.74	0.61	0.43	0.68	0.81	0.10
Uniform Delay, d1	55.0	43.1	33.8	55.6	39.8	32.3	55.6	35.8	33.3	55.4	39.4	29.7
Progression 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
Incremental Delay, d2	4.2	4.7	0.1	13.3	1.3	0.1	7.2	0.7	0.6	4.8	3.4	0.1
Delay (s)	59.1	47.8	33.9	68.8	41.1	32.4	62.8	36.5	33.9	60.2	42.8	29.8
Level of Service	E	D	C	E	D	C	E	D	C	E	D	C
Approach Delay (s)		48.1			48.1			40.7			44.6	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	45.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	130.4	Sum of lost time (s)	16.4
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



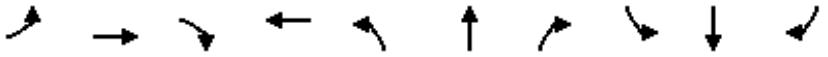
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	159	1643	1213	132	54	170
v/c Ratio	0.41	0.52	0.53	0.15	0.25	0.45
Control Delay	13.1	5.6	11.3	2.3	27.7	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.1	5.6	11.3	2.3	27.7	9.7
Queue Length 50th (m)	4.4	30.7	36.1	0.0	6.0	1.0
Queue Length 95th (m)	10.3	47.3	52.6	6.8	14.9	15.3
Internal Link Dist (m)		1174.8	1361.6			
Turn Bay Length (m)	130.0			85.0	85.0	85.0
Base Capacity (vph)	389	3138	2448	901	860	1038
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	0.41	0.52	0.50	0.15	0.06	0.16

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	159	1643	0	0	1213	132	0	0	0	54	0	170
Future Volume (vph)	159	1643	0	0	1213	132	0	0	0	54	0	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5			4.5	4.5				5.2		5.2
Lane Util. Factor	1.00	*0.80			*0.80	1.00				1.00		1.00
Frt	1.00	1.00			1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1789	4520			4391	1512				1772		1601
Flt Permitted	0.15	1.00			1.00	1.00				0.76		1.00
Satd. Flow (perm)	279	4520			4391	1512				1412		1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	159	1643	0	0	1213	132	0	0	0	54	0	170
RTOR Reduction (vph)	0	0	0	0	0	63	0	0	0	0	0	136
Lane Group Flow (vph)	159	1643	0	0	1213	69	0	0	0	54	0	34
Heavy Vehicles (%)	2%	2%	2%	2%	5%	8%	2%	2%	10%	3%	10%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm				Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	45.0	42.5			31.4	31.4				9.8		9.8
Effective Green, g (s)	46.0	44.5			33.4	33.4				9.8		9.8
Actuated g/C Ratio	0.72	0.70			0.52	0.52				0.15		0.15
Clearance Time (s)	4.0	6.5			6.5	6.5				5.2		5.2
Vehicle Extension (s)	3.0	5.0			5.0	5.0				5.0		5.0
Lane Grp Cap (vph)	391	3142			2291	789				216		245
v/s Ratio Prot	0.05	c0.36			0.28							
v/s Ratio Perm	0.24					0.05				c0.04		0.02
v/c Ratio	0.41	0.52			0.53	0.09				0.25		0.14
Uniform Delay, d1	9.3	4.7			10.1	7.7				23.9		23.4
Progression Factor	1.00	1.00			1.00	1.00				1.00		1.00
Incremental Delay, d2	0.7	0.3			0.4	0.1				1.3		0.5
Delay (s)	10.0	5.0			10.5	7.8				25.1		24.0
Level of Service	B	A			B	A				C		C
Approach Delay (s)		5.4			10.3			0.0			24.3	
Approach LOS		A			B			A			C	

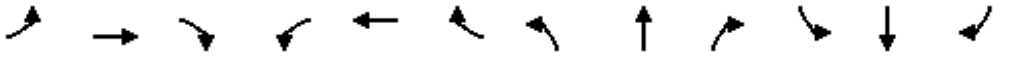
Intersection Summary			
HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	64.0	Sum of lost time (s)	10.7
Intersection Capacity Utilization	52.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	42	1806	12	923	204	54	204	331	119	238
v/c Ratio	0.13	0.66	0.01	0.39	0.61	0.19	0.59	0.85	0.38	0.60
Control Delay	8.7	14.5	0.0	14.4	36.4	37.6	18.6	52.1	40.3	15.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.7	14.5	0.0	14.4	36.4	37.6	18.6	52.1	40.3	15.4
Queue Length 50th (m)	2.7	84.2	0.0	42.6	30.8	9.1	8.3	54.3	20.5	6.3
Queue Length 95th (m)	7.6	118.9	0.0	61.1	49.8	19.7	29.2	#88.4	36.7	28.3
Internal Link Dist (m)		1361.6		653.2		218.8			343.3	
Turn Bay Length (m)	85.0		85.0		85.0		85.0	85.0		85.0
Base Capacity (vph)	330	2758	1020	2761	338	748	700	390	769	732
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.65	0.01	0.33	0.60	0.07	0.29	0.85	0.15	0.33

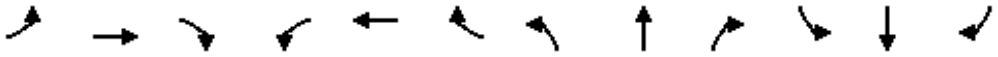
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	1806	12	0	923	0	204	54	204	331	119	238
Future Volume (vph)	42	1806	12	0	923	0	204	54	204	331	119	238
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9		4.9		4.5	3.2	5.2	4.5	3.2	5.2
Lane Util. Factor	1.00	*0.80	1.00		*0.80		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1738	4520	1601		4309		1789	1883	1601	1789	1883	1570
Flt Permitted	0.21	1.00	1.00		1.00		0.60	1.00	1.00	0.67	1.00	1.00
Satd. Flow (perm)	387	4520	1601		4309		1123	1883	1601	1254	1883	1570
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	42	1806	12	0	923	0	204	54	204	331	119	238
RTOR Reduction (vph)	0	0	5	0	0	0	0	0	136	0	0	172
Lane Group Flow (vph)	42	1806	7	0	923	0	204	54	68	331	119	66
Heavy Vehicles (%)	5%	2%	2%	2%	7%	5%	2%	2%	2%	2%	2%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	59.2	59.2	59.2		52.0		23.0	13.1	13.1	25.2	14.2	14.2
Effective Green, g (s)	60.2	61.2	61.2		54.0		23.0	15.1	13.1	25.2	16.2	14.2
Actuated g/C Ratio	0.60	0.61	0.61		0.54		0.23	0.15	0.13	0.25	0.16	0.14
Clearance Time (s)	4.0	6.9	6.9		6.9		4.5	5.2	5.2	4.5	5.2	5.2
Vehicle Extension (s)	3.0	5.0	5.0		5.0		3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	290	2769	980		2329		324	284	209	375	305	223
v/s Ratio Prot	0.01	c0.40			0.21		0.06	0.03		c0.10	0.06	
v/s Ratio Perm	0.08		0.00				0.08		0.04	c0.13		0.04
v/c Ratio	0.14	0.65	0.01		0.40		0.63	0.19	0.33	0.88	0.39	0.29
Uniform Delay, d1	8.7	12.5	7.5		13.4		33.4	37.1	39.4	35.0	37.4	38.4
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.8	0.0		0.2		3.8	0.7	1.9	20.9	1.7	1.5
Delay (s)	8.9	13.2	7.5		13.7		37.2	37.7	41.3	55.9	39.2	39.9
Level of Service	A	B	A		B		D	D	D	E	D	D
Approach Delay (s)		13.1			13.7			39.1			47.5	
Approach LOS		B			B			D			D	

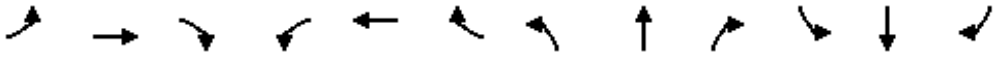
Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	99.9	Sum of lost time (s)	15.6
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	357	1507	479	187	738	159	339	1398	236	286	993	153
v/c Ratio	0.78	0.87	0.60	0.83	0.55	0.26	0.67	0.90	0.37	0.88	0.75	0.27
Control Delay	70.6	46.1	16.5	93.2	42.5	3.9	64.1	52.6	15.9	89.6	48.9	6.5
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	70.6	46.1	16.5	93.2	42.5	3.9	64.1	52.6	15.9	89.6	48.9	6.5
Queue Length 50th (m)	49.4	160.0	41.2	26.9	72.3	0.0	46.8	152.0	19.4	41.0	102.8	0.0
Queue Length 95th (m)	66.7	183.7	77.7	#47.2	88.4	10.7	63.4	175.3	41.6	#65.9	121.8	15.7
Internal Link Dist (m)		653.2			686.5			2451.0			163.2	
Turn Bay Length (m)	130.0		85.0	85.0		95.0	85.0		85.0	230.0		85.0
Base Capacity (vph)	485	1738	792	224	1331	608	503	1579	646	324	1368	577
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	0.74	0.87	0.60	0.83	0.55	0.26	0.67	0.89	0.37	0.88	0.73	0.27

Intersection Summary

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



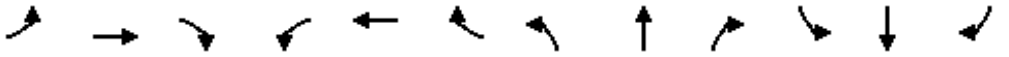
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	357	1507	479	187	738	159	339	1398	236	286	993	153
Future Volume (vph)	357	1507	479	187	738	159	339	1398	236	286	993	153
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.4	5.4	3.0	5.4	5.4
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3248	4520	1601	3471	4309	1555	3471	4520	1601	3471	4520	1555
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3248	4520	1601	3471	4309	1555	3471	4520	1601	3471	4520	1555
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	357	1507	479	187	738	159	339	1398	236	286	993	153
RTOR Reduction (vph)	0	0	177	0	0	110	0	0	89	0	0	108
Lane Group Flow (vph)	357	1507	302	187	738	49	339	1398	147	286	993	45
Heavy Vehicles (%)	9%	2%	2%	2%	7%	5%	2%	2%	2%	2%	2%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	18.5	51.5	51.5	8.0	41.0	41.0	19.2	45.7	45.7	12.0	38.5	38.5
Effective Green, g (s)	19.5	53.5	53.5	9.0	43.0	43.0	20.2	47.7	47.7	13.0	40.5	40.5
Actuated g/C Ratio	0.14	0.38	0.38	0.06	0.31	0.31	0.15	0.34	0.34	0.09	0.29	0.29
Clearance Time (s)	4.0	6.5	6.5	4.0	6.5	6.5	4.0	7.4	7.4	4.0	7.4	7.4
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	5.0	5.0
Lane Grp Cap (vph)	455	1738	615	224	1332	480	504	1549	549	324	1316	452
v/s Ratio Prot	c0.11	c0.33		c0.05	0.17		0.10	c0.31		c0.08	0.22	
v/s Ratio Perm			0.19			0.03			0.09			0.03
v/c Ratio	0.78	0.87	0.49	0.83	0.55	0.10	0.67	0.90	0.27	0.88	0.75	0.10
Uniform Delay, d1	57.8	39.5	32.5	64.3	40.1	34.3	56.3	43.5	33.1	62.3	44.8	36.0
Progression 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
Incremental Delay, d2	8.6	5.3	1.3	22.7	0.9	0.2	3.5	7.7	0.3	23.4	3.0	0.2
Delay (s)	66.4	44.8	33.8	87.0	40.9	34.5	59.8	51.2	33.3	85.7	47.8	36.2
Level of Service	E	D	C	F	D	C	E	D	C	F	D	D
Approach Delay (s)		45.8			47.9			50.5			54.1	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	49.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	139.1	Sum of lost time (s)	15.9
Intersection Capacity Utilization	84.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	336	1682	11	1	811	102	57	409	15	81	214
v/c Ratio	0.73	0.66	0.01	0.00	0.51	0.16	0.14	0.71	0.11	0.14	0.34
Control Delay	23.1	16.6	0.0	10.0	24.5	5.1	23.9	32.3	25.4	22.9	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.1	16.6	0.0	10.0	24.5	5.1	23.9	32.3	25.4	22.9	5.1
Queue Length 50th (m)	26.7	74.5	0.0	0.1	45.4	0.0	7.1	57.7	1.9	9.9	0.0
Queue Length 95th (m)	#73.6	140.5	0.0	0.8	68.2	10.0	17.5	101.1	7.1	22.3	15.6
Internal Link Dist (m)		686.5			658.0			300.4		386.3	
Turn Bay Length (m)	125.0		85.0	135.0		85.0	122.0				85.0
Base Capacity (vph)	488	2767	995	214	2087	822	575	780	197	815	800
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.61	0.01	0.00	0.39	0.12	0.10	0.52	0.08	0.10	0.27

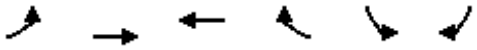
Intersection Summary

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



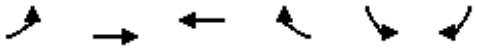
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	336	1682	11	1	811	102	57	253	156	15	81	214
Future Volume (vph)	336	1682	11	1	811	102	57	253	156	15	81	214
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.5	3.5		4.5	3.5	5.5
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1674	4520	1585	1789	4350	1601	1789	1713		1789	1830	1601
Flt Permitted	0.21	1.00	1.00	0.11	1.00	1.00	0.70	1.00		0.24	1.00	1.00
Satd. Flow (perm)	365	4520	1585	215	4350	1601	1327	1713		454	1830	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	336	1682	11	1	811	102	57	253	156	15	81	214
RTOR Reduction (vph)	0	0	5	0	0	62	0	21	0	0	0	151
Lane Group Flow (vph)	336	1682	6	1	811	40	57	388	0	15	81	63
Heavy Vehicles (%)	9%	2%	3%	2%	6%	2%	2%	8%	2%	2%	5%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	53.5	48.6	48.6	35.0	34.1	34.1	27.2	27.2		27.2	27.2	27.2
Effective Green, g (s)	54.5	50.6	50.6	37.0	36.1	36.1	28.2	29.2		28.2	29.2	27.2
Actuated g/C Ratio	0.59	0.55	0.55	0.40	0.39	0.39	0.30	0.31		0.30	0.31	0.29
Clearance Time (s)	4.0	6.5	6.5	4.0	6.5	6.5	5.5	5.5		5.5	5.5	5.5
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	5.0	5.0		5.0	5.0	5.0
Lane Grp Cap (vph)	446	2467	865	118	1694	623	403	539		138	576	469
v/s Ratio Prot	c0.13	0.37		0.00	0.19			c0.23			0.04	
v/s Ratio Perm	c0.31		0.00	0.00		0.02	0.04			0.03		0.04
v/c Ratio	0.75	0.68	0.01	0.01	0.48	0.06	0.14	0.72		0.11	0.14	0.13
Uniform Delay, d1	11.9	15.2	9.6	17.1	21.2	17.7	23.4	28.1		23.2	22.8	24.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.1	0.9	0.0	0.0	0.3	0.1	0.3	5.7		0.7	0.2	0.3
Delay (s)	18.9	16.1	9.6	17.1	21.5	17.8	23.8	33.8		23.9	23.0	24.4
Level of Service	B	B	A	B	C	B	C	C		C	C	C
Approach Delay (s)		16.5			21.1			32.6			24.0	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	92.7	Sum of lost time (s)	11.0
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	318	1535	849	403	309	67
v/c Ratio	0.66	0.52	0.46	0.48	0.35	0.15
Control Delay	13.9	10.0	18.3	4.2	22.5	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.9	10.0	18.3	4.2	22.5	6.9
Queue Length 50th (m)	17.6	40.6	30.6	0.0	16.9	0.0
Queue Length 95th (m)	30.7	51.3	40.9	16.0	26.8	8.3
Internal Link Dist (m)		658.0	685.0		264.0	
Turn Bay Length (m)	125.0			85.0		
Base Capacity (vph)	488	2947	1842	831	895	462
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	0.52	0.46	0.48	0.35	0.15

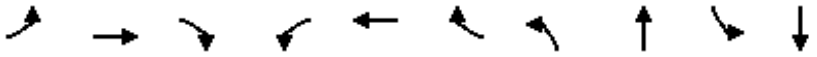
Intersection Summary



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	318	1535	849	403	309	67
Future Volume (vph)	318	1535	849	403	309	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.5	6.5	6.5	5.5	5.5
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1789	5142	5142	1601	3471	1601
Flt Permitted	0.24	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	461	5142	5142	1601	3471	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	318	1535	849	403	309	67
RTOR Reduction (vph)	0	0	0	259	0	50
Lane Group Flow (vph)	318	1535	849	144	309	17
Turn Type	pm+pt	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases	2			6	4	4
Actuated Green, G (s)	39.8	39.8	25.0	25.0	18.0	18.0
Effective Green, g (s)	39.8	39.8	25.0	25.0	18.0	18.0
Actuated g/C Ratio	0.57	0.57	0.36	0.36	0.26	0.26
Clearance Time (s)	4.0	6.5	6.5	6.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	468	2931	1841	573	895	412
v/s Ratio Prot	c0.11	0.30	0.17			
v/s Ratio Perm	c0.28			0.09	c0.09	0.01
v/c Ratio	0.68	0.52	0.46	0.25	0.35	0.04
Uniform Delay, d1	8.6	9.2	17.2	15.8	21.1	19.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.9	0.2	0.2	0.2	1.1	0.2
Delay (s)	12.5	9.4	17.4	16.0	22.2	19.6
Level of Service	B	A	B	B	C	B
Approach Delay (s)		9.9	17.0		21.7	
Approach LOS		A	B		C	

Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	69.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	60.6%	ICU Level of Service	B
Analysis Period (min)	15		

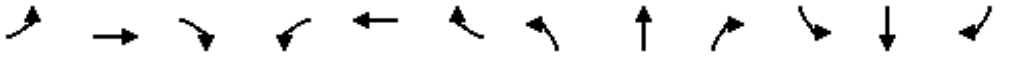
c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	115	1626	102	59	1023	424	228	326	304	137
v/c Ratio	0.41	0.75	0.14	0.31	0.53	0.45	0.78	0.46	0.66	0.48
Control Delay	16.4	27.6	6.0	16.2	23.7	3.6	63.7	41.2	53.4	48.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.4	27.6	6.0	16.2	23.7	3.6	63.7	41.2	53.4	48.8
Queue Length 50th (m)	11.1	123.6	1.9	5.5	66.5	0.0	48.5	33.1	33.6	28.2
Queue Length 95th (m)	21.7	158.3	12.0	12.7	88.3	17.7	#89.0	48.4	48.6	47.3
Internal Link Dist (m)		685.0			1030.1			436.1		413.0
Turn Bay Length (m)	85.0		85.0	85.0		85.0	85.0		85.0	
Base Capacity (vph)	287	2170	757	192	2034	979	318	1344	583	648
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.75	0.13	0.31	0.50	0.43	0.72	0.24	0.52	0.21

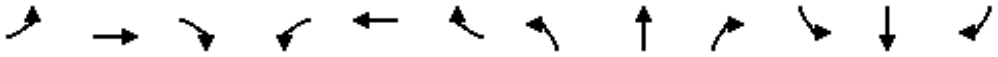
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	1626	102	59	1023	424	228	307	19	304	137	0
Future Volume (vph)	115	1626	102	59	1023	424	228	307	19	304	137	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.5	3.2		4.5	3.2	
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	0.95		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1789	4520	1484	1706	4309	1601	1690	3547		3471	1812	
Flt Permitted	0.16	1.00	1.00	0.08	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	296	4520	1484	146	4309	1601	1690	3547		3471	1812	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	115	1626	102	59	1023	424	228	307	19	304	137	0
RTOR Reduction (vph)	0	0	45	0	0	232	0	4	0	0	0	0
Lane Group Flow (vph)	115	1626	57	59	1023	192	228	322	0	304	137	0
Heavy Vehicles (%)	2%	2%	10%	7%	7%	2%	8%	2%	2%	2%	6%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6						4
Actuated Green, G (s)	58.3	50.6	50.6	53.7	48.3	48.3	19.1	20.0		14.6	15.5	
Effective Green, g (s)	60.3	52.6	52.6	55.7	50.3	50.3	19.1	22.0		14.6	17.5	
Actuated g/C Ratio	0.54	0.47	0.47	0.50	0.45	0.45	0.17	0.20		0.13	0.16	
Clearance Time (s)	4.0	6.5	6.5	4.0	6.5	6.5	4.5	5.2		4.5	5.2	
Vehicle Extension (s)	2.5	5.0	5.0	2.5	5.0	5.0	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	278	2145	704	163	1956	726	291	704		457	286	
v/s Ratio Prot	c0.03	c0.36		0.02	0.24		c0.13	c0.09		0.09	0.08	
v/s Ratio Perm	0.19		0.04	0.16		0.12						
v/c Ratio	0.41	0.76	0.08	0.36	0.52	0.27	0.78	0.46		0.67	0.48	
Uniform Delay, d1	14.0	23.9	15.9	18.6	21.7	18.8	43.9	39.1		45.8	42.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	1.9	0.1	1.0	0.5	0.4	12.9	1.0		3.6	2.6	
Delay (s)	14.7	25.8	16.0	19.6	22.1	19.2	56.8	40.1		49.4	45.1	
Level of Service	B	C	B	B	C	B	E	D		D	D	
Approach Delay (s)		24.5			21.2			47.0			48.1	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	110.8	Sum of lost time (s)	15.2
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

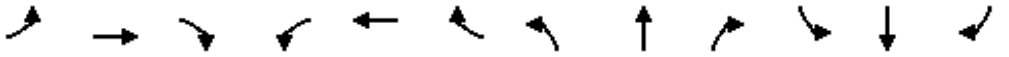


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	117	1411	418	216	990	217	440	1472	430	531	1594	102
v/c Ratio	0.53	1.00	0.63	0.94	0.73	0.36	1.03	0.97	0.66	1.02	0.98	0.17
Control Delay	69.9	70.5	18.2	106.7	45.6	7.0	106.8	60.3	30.2	100.9	59.6	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.9	70.5	18.2	106.7	45.6	7.0	106.8	60.3	30.2	100.9	59.6	6.7
Queue Length 50th (m)	15.8	~157.1	33.2	30.0	98.6	1.9	~64.2	160.3	66.4	~77.3	173.6	1.0
Queue Length 95th (m)	25.9	#196.5	69.3	#54.5	117.5	20.2	#97.3	#198.0	103.7	#112.4	#213.3	12.8
Internal Link Dist (m)		309.3			173.0			421.7			476.7	
Turn Bay Length (m)	50.0		70.0	90.0		70.0	165.0		70.0	140.0		70.0
Base Capacity (vph)	226	1409	664	231	1348	606	429	1517	649	519	1629	611
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	0.52	1.00	0.63	0.94	0.73	0.36	1.03	0.97	0.66	1.02	0.98	0.17

Intersection Summary

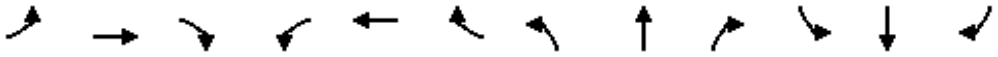
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	117	1411	418	216	990	217	440	1472	430	531	1594	102
Future Volume (vph)	117	1411	418	216	990	217	440	1472	430	531	1594	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3219	4520	1541	3471	4350	1498	3219	4350	1601	3340	4391	1484
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3219	4520	1541	3471	4350	1498	3219	4350	1601	3340	4391	1484
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	117	1411	418	216	990	217	440	1472	430	531	1594	102
RTOR Reduction (vph)	0	0	184	0	0	143	0	0	91	0	0	60
Lane Group Flow (vph)	117	1411	234	216	990	74	440	1472	339	531	1594	42
Heavy Vehicles (%)	10%	2%	6%	2%	6%	9%	10%	6%	2%	6%	5%	10%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	8.3	40.1	40.1	8.0	39.8	39.8	17.0	45.1	45.1	20.0	48.1	48.1
Effective Green, g (s)	9.3	42.1	42.1	9.0	41.8	41.8	18.0	47.1	47.1	21.0	50.1	50.1
Actuated g/C Ratio	0.07	0.31	0.31	0.07	0.31	0.31	0.13	0.35	0.35	0.16	0.37	0.37
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	221	1409	480	231	1346	463	429	1517	558	519	1629	550
v/s Ratio Prot	0.04	c0.31		c0.06	0.23		0.14	0.34		c0.16	c0.36	
v/s Ratio Perm			0.15			0.05			0.21			0.03
v/c Ratio	0.53	1.00	0.49	0.94	0.74	0.16	1.03	0.97	0.61	1.02	0.98	0.08
Uniform Delay, d1	60.7	46.5	37.7	62.7	41.7	33.8	58.5	43.3	36.3	57.0	41.9	27.5
Progression 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
Incremental Delay, d2	2.3	24.3	1.1	41.3	2.3	0.2	50.2	16.7	2.8	45.5	17.4	0.1
Delay (s)	63.0	70.8	38.7	104.0	43.9	34.1	108.7	60.0	39.1	102.5	59.3	27.6
Level of Service	E	E	D	F	D	C	F	E	D	F	E	C
Approach Delay (s)		63.4			51.5			65.3			68.2	
Approach LOS		E			D			E			E	

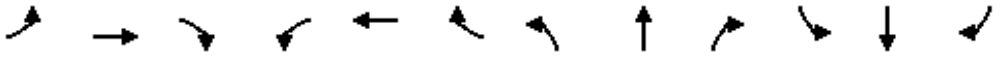
Intersection Summary			
HCM 2000 Control Delay	63.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	15.8
Intersection Capacity Utilization	91.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	335	984	331	227	594	131	176	1542	194	142	873	197
v/c Ratio	0.67	0.82	0.51	0.63	0.57	0.23	0.58	0.86	0.27	0.79	0.56	0.29
Control Delay	62.4	47.6	20.4	67.9	43.3	4.2	69.0	44.6	9.8	94.5	38.1	5.5
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	62.4	47.6	20.4	67.9	43.3	4.2	69.0	44.6	9.8	94.5	38.1	5.5
Queue Length 50th (m)	45.4	128.7	35.8	30.8	71.0	0.0	24.1	161.5	8.4	20.1	80.6	0.0
Queue Length 95th (m)	62.0	154.3	64.0	46.5	94.5	10.4	38.2	#200.3	26.5	#40.6	104.1	17.1
Internal Link Dist (m)		214.6			322.8			302.9			114.0	
Turn Bay Length (m)	85.0		140.0	85.0		85.0	115.0		85.0	85.0		85.0
Base Capacity (vph)	760	1411	729	396	1103	599	308	1792	722	179	1570	683
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	0.44	0.70	0.45	0.57	0.54	0.22	0.57	0.86	0.27	0.79	0.56	0.29

Intersection Summary

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



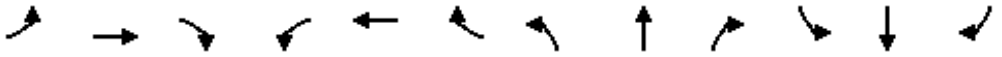
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	335	984	331	227	594	131	176	1542	194	142	873	197
Future Volume (vph)	335	984	331	227	594	131	176	1542	194	142	873	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.8	3.8	3.0	3.8	3.8	3.0	5.4	5.4	3.0	5.4	5.4
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3437	3579	1601	3471	3579	1601	3219	4520	1601	3471	4433	1570
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3437	3579	1601	3471	3579	1601	3219	4520	1601	3471	4433	1570
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	335	984	331	227	594	131	176	1542	194	142	873	197
RTOR Reduction (vph)	0	0	107	0	0	93	0	0	87	0	0	127
Lane Group Flow (vph)	335	984	224	227	594	38	176	1542	107	142	873	70
Heavy Vehicles (%)	3%	2%	2%	2%	2%	2%	10%	2%	2%	2%	4%	4%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	19.0	43.8	43.8	13.1	37.9	37.9	11.8	52.0	52.0	6.0	46.2	46.2
Effective Green, g (s)	20.0	45.8	45.8	14.1	39.9	39.9	12.8	54.0	54.0	7.0	48.2	48.2
Actuated g/C Ratio	0.15	0.34	0.34	0.10	0.29	0.29	0.09	0.40	0.40	0.05	0.35	0.35
Clearance Time (s)	4.0	5.8	5.8	4.0	5.8	5.8	4.0	7.4	7.4	4.0	7.4	7.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	505	1204	538	359	1049	469	302	1793	635	178	1569	556
v/s Ratio Prot	c0.10	c0.27		0.07	0.17		c0.05	c0.34		c0.04	0.20	
v/s Ratio Perm			0.14			0.02			0.07			0.04
v/c Ratio	0.66	0.82	0.42	0.63	0.57	0.08	0.58	0.86	0.17	0.80	0.56	0.13
Uniform Delay, d1	54.9	41.3	34.8	58.5	40.8	34.8	59.1	37.6	26.5	63.8	35.4	29.7
Progression 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
Incremental Delay, d2	3.3	4.4	0.5	3.6	0.7	0.1	4.4	4.9	0.3	21.5	0.7	0.2
Delay (s)	58.1	45.7	35.3	62.1	41.5	34.9	63.5	42.5	26.8	85.3	36.1	29.9
Level of Service	E	D	D	E	D	C	E	D	C	F	D	C
Approach Delay (s)		46.2			45.5			42.8			40.9	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	43.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	136.1	Sum of lost time (s)	15.2
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	223	35	564	197	41	28	1714	61	153	1484	22
v/c Ratio	0.49	0.06	0.94	0.43	0.07	0.17	0.85	0.08	0.78	0.65	0.03
Control Delay	32.8	24.3	52.2	31.3	9.5	13.0	32.4	5.3	47.8	22.6	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.8	24.3	52.2	31.3	9.5	13.0	32.4	5.3	47.8	22.6	0.0
Queue Length 50th (m)	36.9	4.9	93.9	31.9	0.7	2.5	137.5	0.1	17.1	105.1	0.0
Queue Length 95th (m)	59.7	11.9	#158.4	52.2	7.9	6.4	162.3	7.6	#51.0	125.2	0.0
Internal Link Dist (m)		483.8			361.2		451.9			2451.0	
Turn Bay Length (m)	85.0		85.0	85.0		85.0		85.0	85.0		85.0
Base Capacity (vph)	495	678	650	498	612	163	2010	745	195	2285	839
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.05	0.87	0.40	0.07	0.17	0.85	0.08	0.78	0.65	0.03

Intersection Summary

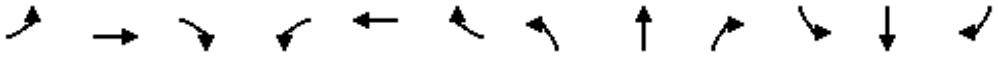
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	223	35	564	197	5	36	28	1714	61	153	1484	22
Future Volume (vph)	223	35	564	197	5	36	28	1714	61	153	1484	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6		4.5	7.6	7.6	4.5	7.6	7.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	1883	1601	1789	1635		1789	4520	1601	1789	4520	1601
Flt Permitted	0.73	1.00	1.00	0.73	1.00		0.09	1.00	1.00	0.07	1.00	1.00
Satd. Flow (perm)	1376	1883	1601	1383	1635		167	4520	1601	140	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	223	35	564	197	5	36	28	1714	61	153	1484	22
RTOR Reduction (vph)	0	0	78	0	24	0	0	0	33	0	0	11
Lane Group Flow (vph)	223	35	486	197	17	0	28	1714	28	153	1484	11
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	35.0	35.0	35.0	35.0	35.0		52.3	49.4	49.4	61.4	54.0	54.0
Effective Green, g (s)	35.0	35.0	35.0	35.0	35.0		52.3	49.4	49.4	61.4	54.0	54.0
Actuated g/C Ratio	0.32	0.32	0.32	0.32	0.32		0.48	0.45	0.45	0.57	0.50	0.50
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6		4.5	7.6	7.6	4.5	7.6	7.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	443	606	515	445	526		123	2056	728	193	2247	796
v/s Ratio Prot		0.02			0.01		0.01	c0.38		c0.05	0.33	
v/s Ratio Perm	0.16		c0.30	0.14			0.10		0.02	0.39		0.01
v/c Ratio	0.50	0.06	0.94	0.44	0.03		0.23	0.83	0.04	0.79	0.66	0.01
Uniform Delay, d1	29.8	25.4	35.8	29.1	25.2		16.2	26.0	16.4	22.7	20.4	13.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	0.0	26.1	0.7	0.0		0.9	4.2	0.1	19.6	1.5	0.0
Delay (s)	30.7	25.5	62.0	29.8	25.2		17.2	30.1	16.5	42.3	22.0	13.9
Level of Service	C	C	E	C	C		B	C	B	D	C	B
Approach Delay (s)		51.9			29.0			29.5			23.7	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	108.6	Sum of lost time (s)	16.7
Intersection Capacity Utilization	88.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	40	1821	313	180	1102	637	395	1507	757	186	878	57
v/c Ratio	0.20	1.05	0.42	0.55	0.58	0.70	1.08	1.02	0.94	0.93	0.70	0.10
Control Delay	63.0	78.0	10.5	64.9	30.9	24.4	124.2	71.5	51.4	109.2	46.3	0.4
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	63.0	78.0	10.5	64.9	30.9	24.4	124.2	71.5	51.4	109.2	46.3	0.4
Queue Length 50th (m)	5.3	~220.6	15.6	23.9	93.9	107.8	~60.2	~176.5	175.4	25.9	87.0	0.0
Queue Length 95th (m)	11.4	#253.8	39.1	36.2	111.2	154.5	#92.4	#210.2	#261.6	#48.8	105.0	0.0
Internal Link Dist (m)		888.5			759.7			657.0			690.8	
Turn Bay Length (m)	130.0		110.0	300.0		70.0	110.0		70.0	130.0		85.0
Base Capacity (vph)	201	1727	749	330	1894	915	367	1482	803	201	1256	548
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	0.20	1.05	0.42	0.55	0.58	0.70	1.08	1.02	0.94	0.93	0.70	0.10

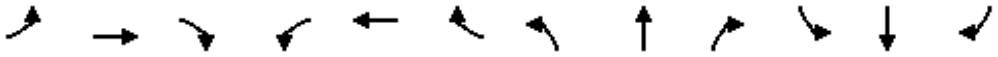
Intersection Summary

~ 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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	1821	313	180	1102	637	395	1507	757	186	878	57
Future Volume (vph)	40	1821	313	180	1102	637	395	1507	757	186	878	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.8	5.8	3.0	5.8	2.0	3.0	4.6	2.0	3.0	4.6	4.6
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3404	4520	1601	3437	4350	1601	3309	4350	1601	3404	4350	1484
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3404	4520	1601	3437	4350	1601	3309	4350	1601	3404	4350	1484
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	40	1821	313	180	1102	637	395	1507	757	186	878	57
RTOR Reduction (vph)	0	0	137	0	0	47	0	0	40	0	0	41
Lane Group Flow (vph)	40	1821	176	180	1102	590	395	1507	717	186	878	16
Heavy Vehicles (%)	4%	2%	2%	3%	6%	2%	7%	6%	2%	4%	6%	10%
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6	7	3	8	1	7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	5.6	50.4	50.4	12.0	56.8	63.8	14.0	44.0	56.0	7.0	37.0	37.0
Effective Green, g (s)	6.6	52.4	52.4	13.0	58.8	67.8	15.0	46.0	60.0	8.0	39.0	39.0
Actuated g/C Ratio	0.05	0.39	0.39	0.10	0.43	0.50	0.11	0.34	0.44	0.06	0.29	0.29
Clearance Time (s)	4.0	7.8	7.8	4.0	7.8	4.0	4.0	6.6	4.0	4.0	6.6	6.6
Vehicle Extension (s)	5.0	3.0	3.0	5.0	3.0	4.0	4.0	5.0	5.0	4.0	5.0	5.0
Lane Grp Cap (vph)	165	1744	617	329	1883	799	365	1473	707	200	1249	426
v/s Ratio Prot	0.01	c0.40		0.05	0.25	0.05	c0.12	c0.35	c0.10	0.05	0.20	
v/s Ratio Perm			0.11			0.32			0.34			0.01
v/c Ratio	0.24	1.04	0.29	0.55	0.59	0.74	1.08	1.02	1.01	0.93	0.70	0.04
Uniform Delay, d1	62.2	41.7	28.8	58.6	29.2	27.0	60.4	44.9	37.9	63.6	43.2	34.9
Progression 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
Incremental Delay, d2	1.6	34.1	0.3	3.3	0.5	3.8	70.9	29.5	37.6	44.6	2.3	0.1
Delay (s)	63.8	75.8	29.0	61.8	29.7	30.8	131.3	74.4	75.5	108.2	45.5	35.0
Level of Service	E	E	C	E	C	C	F	E	E	F	D	C
Approach Delay (s)		68.8			33.1			83.1			55.4	
Approach LOS		E			C			F			E	

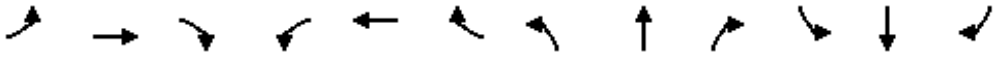
Intersection Summary			
HCM 2000 Control Delay	63.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	135.8	Sum of lost time (s)	16.4
Intersection Capacity Utilization	99.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	106	165	124	318	19	66	1	1588	216	305	2386	111
v/c Ratio	0.31	0.46	0.43	0.87	0.04	0.21	0.01	0.76	0.25	0.90	0.83	0.11
Control Delay	37.0	55.0	7.0	64.5	43.2	1.5	8.0	28.8	4.5	62.0	20.0	0.8
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	37.0	55.0	7.0	64.5	43.2	1.5	8.0	28.8	4.5	62.0	20.0	0.8
Queue Length 50th (m)	19.3	19.6	0.0	65.8	2.0	0.0	0.1	126.3	3.3	54.7	154.7	0.0
Queue Length 95th (m)	34.1	30.8	6.3	#108.7	5.5	0.0	0.6	147.8	16.3	#101.3	228.5	2.9
Internal Link Dist (m)		1074.9			770.5			396.6			272.1	
Turn Bay Length (m)	85.0		85.0	120.0		85.0	170.0		70.0	170.0		70.0
Base Capacity (vph)	337	362	288	365	563	328	156	2097	857	363	2864	1013
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	0.31	0.46	0.43	0.87	0.03	0.20	0.01	0.76	0.25	0.84	0.83	0.11

Intersection Summary

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

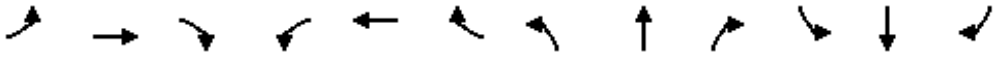


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	165	124	318	19	66	1	1588	216	305	2386	111
Future Volume (vph)	106	165	124	318	19	66	1	1588	216	305	2386	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.4	7.4	3.0	5.4	7.4	3.0	3.6	3.6	3.0	3.6	3.6
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	3579	1526	1789	3544	1484	1755	4433	1601	1722	4433	1484
Flt Permitted	0.74	1.00	1.00	0.56	1.00	1.00	0.07	1.00	1.00	0.07	1.00	1.00
Satd. Flow (perm)	1402	3579	1526	1061	3544	1484	127	4433	1601	118	4433	1484
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	106	165	124	318	19	66	1	1588	216	305	2386	111
RTOR Reduction (vph)	0	0	112	0	0	59	0	0	99	0	0	42
Lane Group Flow (vph)	106	165	12	318	19	7	1	1588	117	305	2386	69
Heavy Vehicles (%)	2%	2%	7%	2%	3%	10%	4%	4%	2%	6%	4%	10%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	8		3	4		5	2		1	6	
Permitted Phases	8		8	4		4	2		2	6		6
Actuated Green, G (s)	24.4	11.6	11.6	28.3	13.3	13.3	58.3	57.2	57.2	79.6	74.5	74.5
Effective Green, g (s)	26.4	13.6	11.6	30.3	15.3	13.3	60.3	59.2	59.2	80.6	76.5	76.5
Actuated g/C Ratio	0.21	0.11	0.09	0.25	0.12	0.11	0.49	0.48	0.48	0.65	0.62	0.62
Clearance Time (s)	4.5	7.4	7.4	4.0	7.4	7.4	4.0	5.6	5.6	4.0	5.6	5.6
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	343	395	143	355	440	160	89	2130	769	329	2752	921
v/s Ratio Prot	0.03	0.05		c0.12	0.01		0.00	0.36		c0.15	0.54	
v/s Ratio Perm	0.03		0.01	c0.10		0.00	0.01		0.07	c0.46		0.05
v/c Ratio	0.31	0.42	0.08	0.90	0.04	0.04	0.01	0.75	0.15	0.93	0.87	0.07
Uniform Delay, d1	40.4	51.1	50.9	43.2	47.5	49.3	21.6	25.9	17.9	38.7	19.2	9.3
Progression 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
Incremental Delay, d2	0.5	1.5	0.5	23.8	0.1	0.2	0.1	2.4	0.4	31.1	4.0	0.2
Delay (s)	40.9	52.6	51.5	67.0	47.6	49.5	21.6	28.3	18.4	69.9	23.2	9.4
Level of Service	D	D	D	E	D	D	C	C	B	E	C	A
Approach Delay (s)		49.1			63.2			27.1			27.7	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	123.2	Sum of lost time (s)	15.5
Intersection Capacity Utilization	90.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Queues
1: Regional Road 25 & Britannia Road

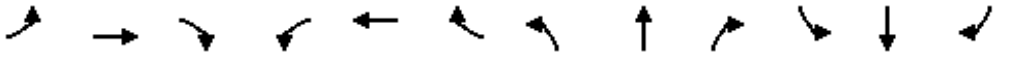
10-23-2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	258	829	238	411	986	244	209	1366	520	243	840	290
v/c Ratio	0.65	0.67	0.41	0.83	0.73	0.40	0.61	0.83	0.68	0.76	0.53	0.38
Control Delay	63.8	45.1	10.4	70.3	45.0	11.8	65.1	43.6	19.9	74.5	35.1	4.9
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	63.8	45.1	10.4	70.3	45.0	11.8	65.1	43.6	19.9	74.5	35.1	4.9
Queue Length 50th (m)	34.0	80.3	7.8	55.6	97.2	11.2	27.7	138.3	52.0	33.1	74.5	0.0
Queue Length 95th (m)	48.4	97.4	29.0	#80.1	116.3	33.1	41.0	161.5	94.1	#52.4	90.6	18.9
Internal Link Dist (m)		239.5			177.4			308.0			325.9	
Turn Bay Length (m)	142.0		89.0	147.0		118.0	120.0		132.0	120.0		115.0
Base Capacity (vph)	438	1363	621	509	1433	634	370	1682	782	322	1611	766
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	0.59	0.61	0.38	0.81	0.69	0.38	0.56	0.81	0.66	0.75	0.52	0.38

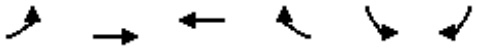
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	258	829	238	411	986	244	209	1366	520	243	840	290
Future Volume (vph)	258	829	238	411	986	244	209	1366	520	243	840	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	4.6	4.6	3.0	4.6	4.6
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3340	4520	1601	3471	4520	1601	3471	4476	1601	3471	4433	1601
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3340	4520	1601	3471	4520	1601	3471	4476	1601	3471	4433	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	258	829	238	411	986	244	209	1366	520	243	840	290
RTOR Reduction (vph)	0	0	144	0	0	131	0	0	184	0	0	186
Lane Group Flow (vph)	258	829	94	411	986	113	209	1366	336	243	840	104
Heavy Vehicles (%)	6%	2%	2%	2%	2%	2%	2%	3%	2%	2%	4%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	14.3	33.4	33.4	17.5	36.6	36.6	11.8	45.5	45.5	11.0	44.7	44.7
Effective Green, g (s)	15.3	35.4	35.4	18.5	38.6	38.6	12.8	47.5	47.5	12.0	46.7	46.7
Actuated g/C Ratio	0.12	0.27	0.27	0.14	0.30	0.30	0.10	0.37	0.37	0.09	0.36	0.36
Clearance Time (s)	4.0	7.8	7.8	4.0	7.8	7.8	4.0	6.6	6.6	4.0	6.6	6.6
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	3.2	3.2	3.0	3.2	3.2
Lane Grp Cap (vph)	393	1232	436	494	1344	476	342	1637	585	320	1594	576
v/s Ratio Prot	0.08	0.18		c0.12	c0.22		0.06	c0.31		c0.07	0.19	
v/s Ratio Perm			0.06			0.07			0.21			0.07
v/c Ratio	0.66	0.67	0.22	0.83	0.73	0.24	0.61	0.83	0.57	0.76	0.53	0.18
Uniform Delay, d1	54.7	42.0	36.5	54.1	41.0	34.5	56.1	37.6	33.0	57.5	32.8	28.5
Progression 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
Incremental Delay, d2	3.9	1.6	0.3	11.4	2.3	0.4	3.2	3.9	1.4	9.9	0.3	0.2
Delay (s)	58.7	43.6	36.8	65.6	43.2	34.8	59.3	41.4	34.5	67.4	33.2	28.6
Level of Service	E	D	D	E	D	C	E	D	C	E	C	C
Approach Delay (s)		45.3			47.6			41.5			38.3	
Approach LOS		D			D			D			D	

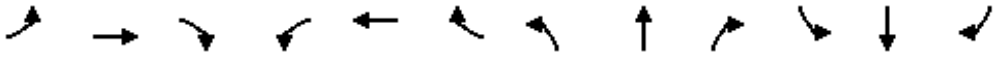
Intersection Summary			
HCM 2000 Control Delay	43.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	129.8	Sum of lost time (s)	16.4
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	244	1362	1711	64	109	80
v/c Ratio	0.76	0.43	0.69	0.07	0.46	0.20
Control Delay	40.8	5.5	15.4	1.5	36.4	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	5.5	15.4	1.5	36.4	1.1
Queue Length 50th (m)	19.7	28.9	72.3	0.0	15.0	0.0
Queue Length 95th (m)	#59.1	46.2	103.1	3.4	29.4	0.0
Internal Link Dist (m)		1174.8	1361.6			
Turn Bay Length (m)	130.0			85.0	85.0	85.0
Base Capacity (vph)	320	3187	2477	918	697	866
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	0.76	0.43	0.69	0.07	0.16	0.09

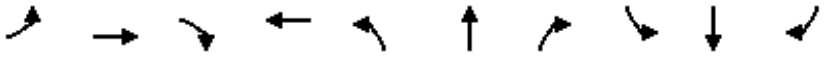
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	244	1362	0	0	1711	64	0	0	0	109	0	80
Future Volume (vph)	244	1362	0	0	1711	64	0	0	0	109	0	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5			4.5	4.5				5.2		5.2
Lane Util. Factor	1.00	*0.80			*0.80	1.00				1.00		1.00
Frt	1.00	1.00			1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1789	4476			4520	1601				1789		1601
Flt Permitted	0.08	1.00			1.00	1.00				0.76		1.00
Satd. Flow (perm)	157	4476			4520	1601				1426		1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	244	1362	0	0	1711	64	0	0	0	109	0	80
RTOR Reduction (vph)	0	0	0	0	0	29	0	0	0	0	0	67
Lane Group Flow (vph)	244	1362	0	0	1711	35	0	0	0	109	0	13
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm				Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	57.1	54.6			41.6	41.6				13.2		13.2
Effective Green, g (s)	58.1	56.6			43.6	43.6				13.2		13.2
Actuated g/C Ratio	0.73	0.71			0.55	0.55				0.17		0.17
Clearance Time (s)	4.0	6.5			6.5	6.5				5.2		5.2
Vehicle Extension (s)	3.0	5.0			5.0	5.0				5.0		5.0
Lane Grp Cap (vph)	320	3186			2478	878				236		265
v/s Ratio Prot	c0.10	0.30			0.38							
v/s Ratio Perm	c0.46					0.02				c0.08		0.01
v/c Ratio	0.76	0.43			0.69	0.04				0.46		0.05
Uniform Delay, d1	19.3	4.7			13.0	8.3				29.9		27.9
Progression Factor	1.00	1.00			1.00	1.00				1.00		1.00
Incremental Delay, d2	10.3	0.2			1.1	0.0				3.0		0.2
Delay (s)	29.6	4.9			14.1	8.3				32.9		28.0
Level of Service	C	A			B	A				C		C
Approach Delay (s)		8.7			13.9			0.0			30.9	
Approach LOS		A			B			A			C	

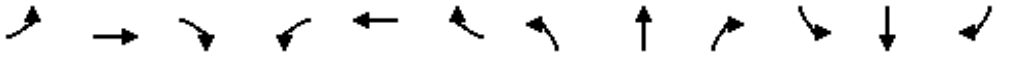
Intersection Summary			
HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	79.5	Sum of lost time (s)	10.7
Intersection Capacity Utilization	63.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	283	1048	238	1763	94	53	96	242	196	91
v/c Ratio	0.79	0.35	0.20	0.79	0.50	0.17	0.27	0.78	0.60	0.25
Control Delay	51.9	9.5	1.5	32.1	49.9	48.2	3.8	63.8	58.6	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.9	9.5	1.5	32.1	49.9	48.2	3.8	63.8	58.6	2.9
Queue Length 50th (m)	53.9	43.3	0.0	157.5	19.8	12.1	0.0	55.7	48.0	0.0
Queue Length 95th (m)	#103.2	62.5	9.0	201.7	34.5	24.2	4.3	81.8	72.5	3.0
Internal Link Dist (m)		1361.6		653.2		218.8			343.3	
Turn Bay Length (m)	85.0		85.0		85.0		85.0	85.0		85.0
Base Capacity (vph)	370	3023	1167	2223	188	556	549	311	570	560
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.35	0.20	0.79	0.50	0.10	0.17	0.78	0.34	0.16

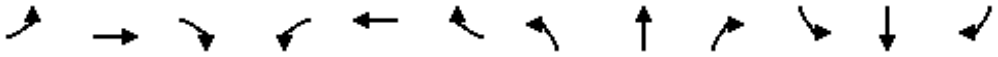
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	283	1048	238	0	1763	0	94	53	96	242	196	91
Future Volume (vph)	283	1048	238	0	1763	0	94	53	96	242	196	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9		4.9		4.5	3.2	5.2	4.5	3.2	5.2
Lane Util. Factor	1.00	*0.80	1.00		*0.80		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	4433	1601		4520		1789	1883	1601	1789	1883	1601
Flt Permitted	0.06	1.00	1.00		1.00		0.34	1.00	1.00	0.68	1.00	1.00
Satd. Flow (perm)	112	4433	1601		4520		645	1883	1601	1286	1883	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	283	1048	238	0	1763	0	94	53	96	242	196	91
RTOR Reduction (vph)	0	0	76	0	0	0	0	0	82	0	0	77
Lane Group Flow (vph)	283	1048	162	0	1763	0	94	53	14	242	196	14
Heavy Vehicles (%)	2%	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	88.2	88.2	88.2		63.1		26.4	19.9	19.9	28.4	20.9	20.9
Effective Green, g (s)	89.2	90.2	90.2		65.1		26.4	21.9	19.9	28.4	22.9	20.9
Actuated g/C Ratio	0.67	0.68	0.68		0.49		0.20	0.17	0.15	0.21	0.17	0.16
Clearance Time (s)	4.0	6.9	6.9		6.9		4.5	5.2	5.2	4.5	5.2	5.2
Vehicle Extension (s)	3.0	5.0	5.0		5.0		3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	355	3024	1092		2225		185	311	240	304	326	253
v/s Ratio Prot	c0.13	0.24			0.39		0.02	0.03		c0.05	0.10	
v/s Ratio Perm	c0.40		0.10				0.08		0.01	c0.13		0.01
v/c Ratio	0.80	0.35	0.15		0.79		0.51	0.17	0.06	0.80	0.60	0.06
Uniform Delay, d1	39.9	8.7	7.4		27.9		45.0	47.4	48.1	48.4	50.4	47.3
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.8	0.1	0.1		2.3		2.2	0.5	0.2	13.4	4.5	0.2
Delay (s)	51.6	8.9	7.6		30.2		47.2	47.9	48.4	61.9	55.0	47.5
Level of Service	D	A	A		C		D	D	D	E	D	D
Approach Delay (s)		16.4			30.2			47.8			56.8	
Approach LOS		B			C			D			E	

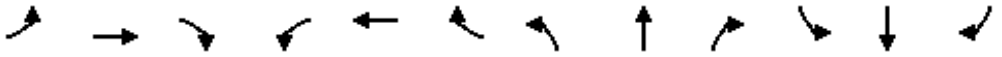
Intersection Summary			
HCM 2000 Control Delay	29.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	132.2	Sum of lost time (s)	15.6
Intersection Capacity Utilization	85.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	275	853	257	347	1389	179	393	1304	78	219	1363	414
v/c Ratio	0.88	0.64	0.40	0.75	0.90	0.27	0.89	0.78	0.12	0.78	0.92	0.63
Control Delay	89.8	45.3	9.0	69.0	52.6	7.2	82.8	42.7	1.3	81.8	56.8	25.1
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	89.8	45.3	9.0	69.0	52.6	7.2	82.8	42.7	1.3	81.8	56.8	25.1
Queue Length 50th (m)	39.4	86.6	6.2	47.8	151.8	2.9	56.0	132.0	0.0	31.1	151.6	51.5
Queue Length 95th (m)	#63.5	104.0	28.2	64.4	175.1	19.2	#83.2	153.0	2.8	#49.3	#183.4	88.0
Internal Link Dist (m)		653.2			686.5			2451.0			163.2	
Turn Bay Length (m)	130.0		85.0	85.0		95.0	85.0		85.0	230.0		85.0
Base Capacity (vph)	314	1339	637	495	1546	655	441	1682	671	282	1475	654
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	0.88	0.64	0.40	0.70	0.90	0.27	0.89	0.78	0.12	0.78	0.92	0.63

Intersection Summary

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



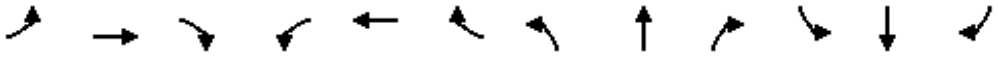
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	275	853	257	347	1389	179	393	1304	78	219	1363	414
Future Volume (vph)	275	853	257	347	1389	179	393	1304	78	219	1363	414
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.4	5.4	3.0	5.4	5.4
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3471	4476	1601	3471	4520	1601	3471	4520	1601	3471	4520	1601
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3471	4476	1601	3471	4520	1601	3471	4520	1601	3471	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	275	853	257	347	1389	179	393	1304	78	219	1363	414
RTOR Reduction (vph)	0	0	158	0	0	107	0	0	49	0	0	132
Lane Group Flow (vph)	275	853	99	347	1389	72	393	1304	29	219	1363	282
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	11.7	39.9	39.9	17.7	45.9	45.9	16.8	50.1	50.1	10.4	43.7	43.7
Effective Green, g (s)	12.7	41.9	41.9	18.7	47.9	47.9	17.8	52.1	52.1	11.4	45.7	45.7
Actuated g/C Ratio	0.09	0.30	0.30	0.13	0.34	0.34	0.13	0.37	0.37	0.08	0.33	0.33
Clearance Time (s)	4.0	6.5	6.5	4.0	6.5	6.5	4.0	7.4	7.4	4.0	7.4	7.4
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	5.0	5.0
Lane Grp Cap (vph)	314	1339	479	463	1546	547	441	1682	595	282	1475	522
v/s Ratio Prot	c0.08	0.19		c0.10	c0.31		c0.11	0.29		0.06	c0.30	
v/s Ratio Perm			0.06			0.04			0.02			0.18
v/c Ratio	0.88	0.64	0.21	0.75	0.90	0.13	0.89	0.78	0.05	0.78	0.92	0.54
Uniform Delay, d1	62.9	42.5	36.6	58.4	43.7	31.7	60.1	38.8	28.1	63.1	45.5	38.6
Progression 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
Incremental Delay, d2	22.8	1.4	0.4	6.6	7.8	0.2	19.7	2.3	0.0	12.6	10.5	2.0
Delay (s)	85.6	43.9	37.1	64.9	51.6	31.9	79.8	41.1	28.1	75.6	55.9	40.6
Level of Service	F	D	D	E	D	C	E	D	C	E	E	D
Approach Delay (s)		50.9			52.1			49.1			54.9	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	51.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.9
Intersection Capacity Utilization	87.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	150	956	43	144	1530	159	28	80	161	217	357
v/c Ratio	0.66	0.45	0.06	0.43	0.70	0.19	0.10	0.14	0.42	0.41	0.70
Control Delay	29.5	16.4	1.8	12.9	20.7	3.4	22.2	19.5	27.7	25.9	23.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.5	16.4	1.8	12.9	20.7	3.4	22.2	19.5	27.7	25.9	23.9
Queue Length 50th (m)	9.3	40.7	0.0	8.8	77.7	0.0	3.4	8.5	21.7	28.8	32.4
Queue Length 95th (m)	#43.7	68.3	2.8	22.7	125.0	11.0	9.2	17.7	37.7	46.6	60.5
Internal Link Dist (m)		686.5			658.0			300.4		386.3	
Turn Bay Length (m)	125.0		85.0	135.0		85.0	122.0				85.0
Base Capacity (vph)	226	2261	805	333	2328	901	434	864	604	815	734
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.42	0.05	0.43	0.66	0.18	0.06	0.09	0.27	0.27	0.49

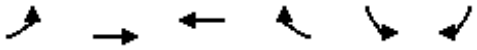
Intersection Summary

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



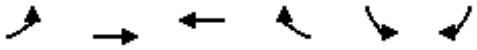
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	956	43	144	1530	159	28	68	12	161	217	357
Future Volume (vph)	150	956	43	144	1530	159	28	68	12	161	217	357
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.5	3.5		4.5	3.5	5.5
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1659	4350	1484	1789	4520	1601	1789	1841		1789	1746	1484
Flt Permitted	0.10	1.00	1.00	0.20	1.00	1.00	0.51	1.00		0.70	1.00	1.00
Satd. Flow (perm)	172	4350	1484	384	4520	1601	954	1841		1328	1746	1484
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	150	956	43	144	1530	159	28	68	12	161	217	357
RTOR Reduction (vph)	0	0	22	0	0	82	0	7	0	0	0	99
Lane Group Flow (vph)	150	956	21	144	1530	77	28	73	0	161	217	258
Heavy Vehicles (%)	10%	6%	10%	2%	2%	2%	2%	2%	2%	2%	10%	10%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	45.6	39.5	39.5	44.8	39.1	39.1	23.8	23.8		23.8	23.8	23.8
Effective Green, g (s)	47.6	41.5	41.5	46.8	41.1	41.1	24.8	25.8		24.8	25.8	23.8
Actuated g/C Ratio	0.56	0.49	0.49	0.55	0.48	0.48	0.29	0.30		0.29	0.30	0.28
Clearance Time (s)	4.0	6.5	6.5	4.0	6.5	6.5	5.5	5.5		5.5	5.5	5.5
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	5.0	5.0		5.0	5.0	5.0
Lane Grp Cap (vph)	220	2123	724	322	2185	774	278	558		387	529	415
v/s Ratio Prot	c0.06	0.22		0.04	c0.34			0.04			0.12	
v/s Ratio Perm	0.32		0.01	0.21		0.05	0.03			0.12		c0.17
v/c Ratio	0.68	0.45	0.03	0.45	0.70	0.10	0.10	0.13		0.42	0.41	0.62
Uniform Delay, d1	13.2	14.3	11.3	9.8	17.1	11.9	22.0	21.5		24.3	23.5	26.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	8.4	0.2	0.0	1.0	1.1	0.1	0.3	0.2		1.5	1.1	4.1
Delay (s)	21.7	14.5	11.3	10.8	18.2	12.0	22.3	21.7		25.8	24.6	30.7
Level of Service	C	B	B	B	B	B	C	C		C	C	C
Approach Delay (s)		15.3			17.1			21.8			27.8	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	112	1018	1549	353	373	284
v/c Ratio	0.38	0.39	0.79	0.43	0.33	0.42
Control Delay	10.7	8.7	19.9	3.6	16.6	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.7	8.7	19.9	3.6	16.6	7.1
Queue Length 50th (m)	5.4	21.1	53.9	0.0	16.1	5.2
Queue Length 95th (m)	11.5	28.4	70.1	13.5	25.6	20.4
Internal Link Dist (m)		658.0	685.0		264.0	
Turn Bay Length (m)	125.0			85.0		
Base Capacity (vph)	293	2959	2049	850	1137	670
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	0.38	0.34	0.76	0.42	0.33	0.42

Intersection Summary



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	112	1018	1549	353	373	284
Future Volume (vph)	112	1018	1549	353	373	284
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1789	5142	5142	1601	3471	1601
Flt Permitted	0.15	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	288	5142	5142	1601	3471	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	112	1018	1549	353	373	284
RTOR Reduction (vph)	0	0	0	221	0	147
Lane Group Flow (vph)	112	1018	1549	132	373	137
Turn Type	pm+pt	NA	NA	Perm	Perm	Perm
Protected Phases	7	4	8			
Permitted Phases	4			8	6	6
Actuated Green, G (s)	30.4	30.4	21.7	21.7	18.7	18.7
Effective Green, g (s)	30.4	30.4	21.7	21.7	18.7	18.7
Actuated g/C Ratio	0.52	0.52	0.37	0.37	0.32	0.32
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	259	2690	1920	597	1117	515
v/s Ratio Prot	0.03	c0.20	c0.30			
v/s Ratio Perm	0.20			0.08	c0.11	0.09
v/c Ratio	0.43	0.38	0.81	0.22	0.33	0.27
Uniform Delay, d1	9.9	8.2	16.3	12.4	15.0	14.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	0.1	2.6	0.2	0.8	1.3
Delay (s)	11.0	8.3	18.9	12.6	15.8	15.9
Level of Service	B	A	B	B	B	B
Approach Delay (s)		8.6	17.7		15.8	
Approach LOS		A	B		B	

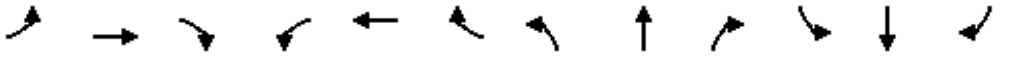
Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	58.1	Sum of lost time (s)	13.5
Intersection Capacity Utilization	58.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	15	1233	143	13	1725	417	91	182	252	303	87
v/c Ratio	0.08	0.57	0.17	0.06	0.74	0.42	0.60	0.23	0.67	0.65	0.20
Control Delay	13.3	21.2	3.8	12.9	25.1	5.6	68.3	33.0	57.8	43.9	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.3	21.2	3.8	12.9	25.1	5.6	68.3	33.0	57.8	43.9	6.0
Queue Length 50th (m)	1.3	64.5	0.0	1.1	103.1	7.1	17.8	14.7	25.1	54.4	0.0
Queue Length 95th (m)	5.0	118.5	11.6	4.7	184.4	33.8	#46.5	26.4	#47.9	91.0	9.4
Internal Link Dist (m)		685.0			1030.1			436.1		413.0	
Turn Bay Length (m)	85.0		85.0	85.0		85.0	85.0		85.0		85.0
Base Capacity (vph)	185	2168	858	232	2338	992	160	1290	405	736	659
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.57	0.17	0.06	0.74	0.42	0.57	0.14	0.62	0.41	0.13

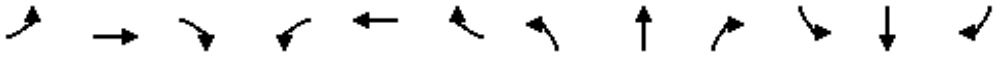
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	1233	143	13	1725	417	91	161	21	252	303	87
Future Volume (vph)	15	1233	143	13	1725	417	91	161	21	252	303	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.5	3.2		4.5	3.2	5.2
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	0.95		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1659	4192	1526	1690	4520	1601	1772	3517		3471	1883	1601
Flt Permitted	0.07	1.00	1.00	0.12	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	127	4192	1526	219	4520	1601	1772	3517		3471	1883	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	15	1233	143	13	1725	417	91	161	21	252	303	87
RTOR Reduction (vph)	0	0	71	0	0	169	0	9	0	0	0	67
Lane Group Flow (vph)	15	1233	72	13	1725	248	91	173	0	252	303	20
Heavy Vehicles (%)	10%	10%	7%	8%	2%	2%	3%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6						4
Actuated Green, G (s)	56.5	54.0	54.0	56.5	54.0	54.0	9.2	22.3		11.8	24.9	24.9
Effective Green, g (s)	58.5	56.0	56.0	58.5	56.0	56.0	9.2	24.3		11.8	26.9	24.9
Actuated g/C Ratio	0.53	0.51	0.51	0.53	0.51	0.51	0.08	0.22		0.11	0.24	0.22
Clearance Time (s)	4.0	6.5	6.5	4.0	6.5	6.5	4.5	5.2		4.5	5.2	5.2
Vehicle Extension (s)	2.5	5.0	5.0	2.5	5.0	5.0	3.0	5.0		3.0	5.0	5.0
Lane Grp Cap (vph)	115	2118	771	162	2284	809	147	771		369	457	359
v/s Ratio Prot	c0.00	0.29		0.00	c0.38		0.05	0.05		c0.07	c0.16	
v/s Ratio Perm	0.06		0.05	0.04		0.16						0.01
v/c Ratio	0.13	0.58	0.09	0.08	0.76	0.31	0.62	0.22		0.68	0.66	0.05
Uniform Delay, d1	17.3	19.2	14.2	13.9	21.9	16.0	49.1	35.5		47.7	37.9	33.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	0.6	0.1	0.2	1.7	0.5	7.5	0.3		5.2	4.7	0.1
Delay (s)	17.7	19.8	14.3	14.0	23.7	16.5	56.7	35.8		52.8	42.6	33.8
Level of Service	B	B	B	B	C	B	E	D		D	D	C
Approach Delay (s)		19.2			22.2			42.8			45.4	
Approach LOS		B			C			D			D	

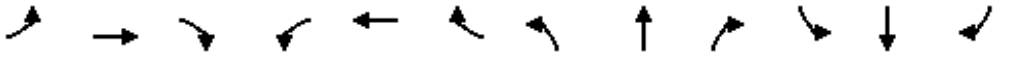
Intersection Summary			
HCM 2000 Control Delay	25.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	110.8	Sum of lost time (s)	15.2
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	57	1004	486	350	1623	610	446	1490	238	237	1281	134
v/c Ratio	0.37	0.75	0.76	0.86	0.93	0.70	0.92	0.88	0.34	0.73	0.86	0.22
Control Delay	73.9	49.4	31.6	82.5	53.2	27.0	86.3	48.8	12.9	77.0	51.7	4.5
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	73.9	49.4	31.6	82.5	53.2	27.0	86.3	48.8	12.9	77.0	51.7	4.5
Queue Length 50th (m)	8.3	107.5	68.8	51.6	186.9	111.7	66.2	167.9	16.0	34.6	144.2	0.0
Queue Length 95th (m)	15.9	126.7	113.0	#76.5	#223.1	157.3	#97.5	191.6	37.0	49.1	166.8	11.2
Internal Link Dist (m)		309.3			173.0			421.7			476.7	
Turn Bay Length (m)	50.0		70.0	90.0		70.0	165.0		70.0	140.0		70.0
Base Capacity (vph)	156	1398	659	413	1745	882	486	1697	702	340	1493	613
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	0.37	0.72	0.74	0.85	0.93	0.69	0.92	0.88	0.34	0.70	0.86	0.22

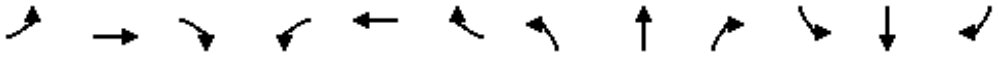
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	1004	486	350	1623	610	446	1490	238	237	1281	134
Future Volume (vph)	57	1004	486	350	1623	610	446	1490	238	237	1281	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	2.0	3.0	4.9	4.9	3.0	4.9	4.9
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3437	4476	1601	3471	4520	1601	3471	4476	1601	3471	4476	1541
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3437	4476	1601	3471	4520	1601	3471	4476	1601	3471	4476	1541
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	57	1004	486	350	1623	610	446	1490	238	237	1281	134
RTOR Reduction (vph)	0	0	161	0	0	47	0	0	96	0	0	90
Lane Group Flow (vph)	57	1004	325	350	1623	563	446	1490	142	237	1281	44
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%	2%	3%	2%	2%	3%	6%
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	4.3	41.5	41.5	15.8	53.0	65.4	18.9	52.2	52.2	12.4	45.7	45.7
Effective Green, g (s)	5.3	43.5	43.5	16.8	55.0	69.4	19.9	54.2	54.2	13.4	47.7	47.7
Actuated g/C Ratio	0.04	0.30	0.30	0.12	0.38	0.48	0.14	0.38	0.38	0.09	0.33	0.33
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	4.0	4.0	6.9	6.9	4.0	6.9	6.9
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	126	1354	484	405	1729	773	480	1688	603	323	1485	511
v/s Ratio Prot	0.02	0.22		c0.10	c0.36	0.07	c0.13	c0.33		0.07	0.29	
v/s Ratio Perm			0.20			0.28			0.09			0.03
v/c Ratio	0.45	0.74	0.67	0.86	0.94	0.73	0.93	0.88	0.24	0.73	0.86	0.09
Uniform Delay, d1	67.8	45.0	43.8	62.3	42.7	29.6	61.2	41.8	30.6	63.4	44.9	33.0
Progression 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
Incremental Delay, d2	2.6	2.4	4.0	17.1	10.4	3.5	24.3	7.1	0.9	8.4	6.9	0.3
Delay (s)	70.3	47.4	47.8	79.5	53.2	33.1	85.5	48.9	31.5	71.8	51.8	33.4
Level of Service	E	D	D	E	D	C	F	D	C	E	D	C
Approach Delay (s)		48.4			52.0			54.5			53.2	
Approach LOS		D			D			D			D	

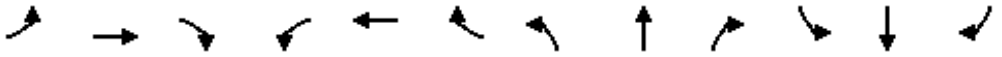
Intersection Summary			
HCM 2000 Control Delay	52.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	143.7	Sum of lost time (s)	15.8
Intersection Capacity Utilization	87.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	184	782	184	284	1134	114	287	1298	172	195	1529	195
v/c Ratio	0.44	0.67	0.30	0.67	0.97	0.19	0.99	0.78	0.25	0.82	0.96	0.30
Control Delay	57.6	42.0	10.8	63.3	64.0	5.1	111.7	41.5	7.9	86.3	57.0	11.5
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	57.6	42.0	10.8	63.3	64.0	5.1	111.7	41.5	7.9	86.3	57.0	11.5
Queue Length 50th (m)	23.0	92.8	8.0	36.4	152.5	0.0	38.8	122.7	4.6	26.0	159.5	10.2
Queue Length 95th (m)	36.0	116.3	25.7	52.5	#195.5	11.2	#71.2	152.9	20.7	#47.9	#210.5	29.3
Internal Link Dist (m)		214.6			322.8			302.9			114.0	
Turn Bay Length (m)	85.0		140.0	85.0		85.0	115.0		85.0	85.0		85.0
Base Capacity (vph)	773	1463	737	480	1169	606	289	1656	678	239	1591	652
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	0.24	0.53	0.25	0.59	0.97	0.19	0.99	0.78	0.25	0.82	0.96	0.30

Intersection Summary

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



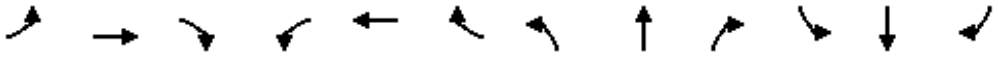
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	184	782	184	284	1134	114	287	1298	172	195	1529	195
Future Volume (vph)	184	782	184	284	1134	114	287	1298	172	195	1529	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.8	3.8	3.0	3.8	3.8	3.0	5.4	5.4	3.0	5.4	5.4
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3404	3579	1601	3471	3579	1601	3471	4520	1601	3471	4520	1601
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3404	3579	1601	3471	3579	1601	3471	4520	1601	3471	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	184	782	184	284	1134	114	287	1298	172	195	1529	195
RTOR Reduction (vph)	0	0	94	0	0	77	0	0	91	0	0	88
Lane Group Flow (vph)	184	782	90	284	1134	37	287	1298	81	195	1529	107
Heavy Vehicles (%)	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	15.2	41.1	41.1	15.3	41.2	41.2	10.0	46.4	46.4	8.1	44.5	44.5
Effective Green, g (s)	16.2	43.1	43.1	16.3	43.2	43.2	11.0	48.4	48.4	9.1	46.5	46.5
Actuated g/C Ratio	0.12	0.33	0.33	0.12	0.33	0.33	0.08	0.37	0.37	0.07	0.35	0.35
Clearance Time (s)	4.0	5.8	5.8	4.0	5.8	5.8	4.0	7.4	7.4	4.0	7.4	7.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	417	1167	522	428	1170	523	289	1656	586	239	1591	563
v/s Ratio Prot	0.05	0.22		c0.08	c0.32		c0.08	0.29		0.06	c0.34	
v/s Ratio Perm			0.06			0.02			0.05			0.07
v/c Ratio	0.44	0.67	0.17	0.66	0.97	0.07	0.99	0.78	0.14	0.82	0.96	0.19
Uniform Delay, d1	53.8	38.4	31.8	55.3	43.8	30.6	60.5	37.2	27.9	60.7	41.9	29.7
Progression 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
Incremental Delay, d2	0.7	1.5	0.2	3.9	19.1	0.1	51.0	2.9	0.2	18.9	14.6	0.3
Delay (s)	54.5	39.9	31.9	59.1	62.9	30.7	111.5	40.1	28.2	79.6	56.5	30.1
Level of Service	D	D	C	E	E	C	F	D	C	E	E	C
Approach Delay (s)		41.0			59.8			50.6			56.2	
Approach LOS		D			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	52.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	132.1	Sum of lost time (s)	15.2
Intersection Capacity Utilization	96.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	117	12	267	82	182	187	1505	208	57	1519	392
v/c Ratio	0.71	0.04	0.70	0.34	0.46	0.63	0.56	0.20	0.24	0.68	0.39
Control Delay	52.8	25.3	25.0	31.1	13.0	22.6	12.0	2.2	7.5	17.0	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.8	25.3	25.0	31.1	13.0	22.6	12.0	2.2	7.5	17.0	2.8
Queue Length 50th (m)	16.1	1.5	17.9	10.5	6.0	9.3	57.0	0.0	2.0	64.8	0.0
Queue Length 95th (m)	32.5	5.6	41.0	22.0	21.6	#39.0	87.5	9.8	6.5	97.5	14.0
Internal Link Dist (m)		483.8			361.2		451.9			2451.0	
Turn Bay Length (m)	85.0		85.0	85.0		85.0		85.0	85.0		85.0
Base Capacity (vph)	468	917	847	688	871	300	2689	1036	234	2250	994
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.01	0.32	0.12	0.21	0.62	0.56	0.20	0.24	0.68	0.39

Intersection Summary

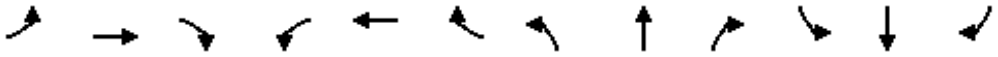
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	117	12	267	82	29	153	187	1505	208	57	1519	392
Future Volume (vph)	117	12	267	82	29	153	187	1505	208	57	1519	392
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6		4.5	7.6	7.6	4.5	7.6	7.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	1883	1601	1789	1646		1789	4520	1601	1789	4520	1601
Flt Permitted	0.51	1.00	1.00	0.75	1.00		0.09	1.00	1.00	0.12	1.00	1.00
Satd. Flow (perm)	961	1883	1601	1412	1646		170	4520	1601	217	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	117	12	267	82	29	153	187	1505	208	57	1519	392
RTOR Reduction (vph)	0	0	109	0	111	0	0	0	87	0	0	192
Lane Group Flow (vph)	117	12	158	82	71	0	187	1505	121	57	1519	200
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	13.1	13.1	13.1	13.1	13.1		52.7	45.3	45.3	42.7	39.8	39.8
Effective Green, g (s)	13.1	13.1	13.1	13.1	13.1		52.7	45.3	45.3	42.7	39.8	39.8
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.17		0.68	0.58	0.58	0.55	0.51	0.51
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6		4.5	7.6	7.6	4.5	7.6	7.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	161	316	268	237	276		289	2625	929	177	2306	816
v/s Ratio Prot		0.01			0.04		c0.07	0.33		0.01	0.34	
v/s Ratio Perm	c0.12		0.10	0.06			c0.37		0.08	0.16		0.12
v/c Ratio	0.73	0.04	0.59	0.35	0.26		0.65	0.57	0.13	0.32	0.66	0.25
Uniform Delay, d1	30.8	27.2	30.0	28.7	28.2		11.7	10.3	7.4	8.4	14.1	10.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.0	0.0	3.3	0.9	0.5		4.9	0.9	0.3	1.1	1.5	0.7
Delay (s)	45.8	27.2	33.3	29.5	28.7		16.7	11.2	7.7	9.5	15.6	11.4
Level of Service	D	C	C	C	C		B	B	A	A	B	B
Approach Delay (s)		36.8			29.0			11.3			14.6	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	78.0	Sum of lost time (s)	16.7
Intersection Capacity Utilization	74.9%	ICU Level of Service	D
Analysis Period (min)	15		

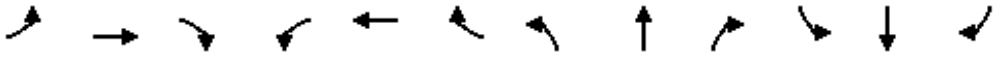
c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	119	1112	395	352	1875	547	307	1094	323	288	1367	99
v/c Ratio	0.67	0.72	0.58	0.73	0.97	0.67	0.99	0.82	0.50	0.80	0.98	0.17
Control Delay	85.9	44.9	22.3	68.9	54.5	23.0	112.8	53.1	13.3	80.7	67.9	3.2
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	85.9	44.9	22.3	68.9	54.5	23.0	112.8	53.1	13.3	80.7	67.9	3.2
Queue Length 50th (m)	17.6	116.8	45.7	50.2	216.4	73.9	46.1	121.7	16.8	42.3	162.0	0.0
Queue Length 95th (m)	#30.1	136.5	79.8	67.2	#257.4	116.0	#76.8	142.5	45.0	#62.7	#199.0	7.5
Internal Link Dist (m)		888.5			759.7			657.0			690.8	
Turn Bay Length (m)	130.0		110.0	300.0		70.0	110.0		70.0	130.0		85.0
Base Capacity (vph)	177	1540	682	502	1938	817	311	1339	650	359	1401	587
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	0.67	0.72	0.58	0.70	0.97	0.67	0.99	0.82	0.50	0.80	0.98	0.17

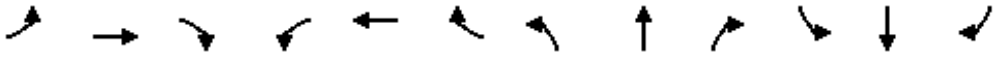
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	119	1112	395	352	1875	547	307	1094	323	288	1367	99
Future Volume (vph)	119	1112	395	352	1875	547	307	1094	323	288	1367	99
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	4.6	4.6	3.0	4.6	4.6
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3219	4476	1601	3471	4520	1601	3471	4476	1601	3471	4476	1601
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3219	4476	1601	3471	4520	1601	3471	4476	1601	3471	4476	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	119	1112	395	352	1875	547	307	1094	323	288	1367	99
RTOR Reduction (vph)	0	0	131	0	0	131	0	0	171	0	0	68
Lane Group Flow (vph)	119	1112	264	352	1875	416	307	1094	152	288	1367	31
Heavy Vehicles (%)	10%	3%	2%	2%	2%	2%	2%	3%	2%	2%	3%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	7.0	47.9	47.9	19.3	60.2	60.2	12.0	41.4	41.4	14.0	43.4	43.4
Effective Green, g (s)	8.0	49.9	49.9	20.3	62.2	62.2	13.0	43.4	43.4	15.0	45.4	45.4
Actuated g/C Ratio	0.06	0.34	0.34	0.14	0.43	0.43	0.09	0.30	0.30	0.10	0.31	0.31
Clearance Time (s)	4.0	7.8	7.8	4.0	7.8	7.8	4.0	6.6	6.6	4.0	6.6	6.6
Vehicle Extension (s)	5.0	3.0	3.0	5.0	3.0	3.0	4.0	5.0	5.0	4.0	5.0	5.0
Lane Grp Cap (vph)	177	1540	550	485	1938	686	311	1339	479	359	1401	501
v/s Ratio Prot	0.04	0.25		c0.10	c0.41		c0.09	0.24		0.08	c0.31	
v/s Ratio Perm			0.16			0.26			0.09			0.02
v/c Ratio	0.67	0.72	0.48	0.73	0.97	0.61	0.99	0.82	0.32	0.80	0.98	0.06
Uniform Delay, d1	67.2	41.5	37.4	59.7	40.4	32.0	65.9	47.1	39.3	63.5	49.3	34.9
Progression 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
Incremental Delay, d2	12.4	1.7	0.7	6.5	13.5	1.5	47.2	4.5	0.8	12.8	18.6	0.1
Delay (s)	79.6	43.2	38.0	66.2	53.9	33.5	113.1	51.6	40.1	76.4	67.8	35.0
Level of Service	E	D	D	E	D	C	F	D	D	E	E	C
Approach Delay (s)		44.6			51.4			60.4			67.4	
Approach LOS		D			D			E			E	

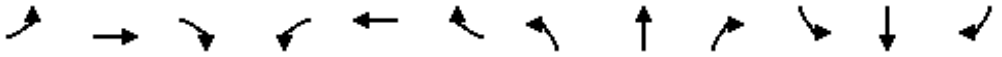
Intersection Summary			
HCM 2000 Control Delay	55.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	92.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	74	52	12	252	143	323	136	2112	264	167	1594	73
v/c Ratio	0.32	0.13	0.05	0.80	0.29	0.66	0.55	0.80	0.21	0.70	0.60	0.07
Control Delay	37.5	45.2	0.3	57.4	43.7	34.3	22.7	21.1	1.1	37.6	16.3	0.4
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	37.5	45.2	0.3	57.4	43.7	34.3	22.7	21.1	1.1	37.6	16.3	0.4
Queue Length 50th (m)	12.6	5.4	0.0	47.4	14.6	47.9	9.7	146.5	0.0	18.2	89.5	0.0
Queue Length 95th (m)	24.7	11.4	0.0	#83.5	24.2	78.5	28.3	171.5	6.9	#45.5	111.2	0.9
Internal Link Dist (m)		1074.9			770.5			396.6			272.1	
Turn Bay Length (m)	85.0		85.0	120.0		85.0	170.0		70.0	170.0		70.0
Base Capacity (vph)	229	397	250	314	520	503	287	2643	1242	257	2642	989
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	0.32	0.13	0.05	0.80	0.28	0.64	0.47	0.80	0.21	0.65	0.60	0.07

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	52	12	252	143	323	136	2112	264	167	1594	73
Future Volume (vph)	74	52	12	252	143	323	136	2112	264	167	1594	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.4	7.4	3.0	5.4	4.0	3.0	3.6	2.0	3.0	3.6	3.6
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	3510	1601	1789	3579	1601	1789	4520	1601	1789	4520	1601
Flt Permitted	0.66	1.00	1.00	0.54	1.00	1.00	0.07	1.00	1.00	0.07	1.00	1.00
Satd. Flow (perm)	1246	3510	1601	1013	3579	1601	136	4520	1601	123	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	74	52	12	252	143	323	136	2112	264	167	1594	73
RTOR Reduction (vph)	0	0	11	0	0	56	0	0	83	0	0	31
Lane Group Flow (vph)	74	52	1	252	143	267	136	2112	181	167	1594	42
Heavy Vehicles (%)	2%	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	Perm
Protected Phases	7	8		3	4	1	5	2	3	1	6	
Permitted Phases	8		8	4		4	2		2	6		6
Actuated Green, G (s)	11.8	7.8	7.8	21.8	13.3	22.3	69.2	60.2	70.2	69.2	60.2	60.2
Effective Green, g (s)	13.8	9.8	7.8	22.8	15.3	22.3	71.2	62.2	74.2	71.2	62.2	62.2
Actuated g/C Ratio	0.13	0.09	0.07	0.21	0.14	0.21	0.66	0.58	0.69	0.66	0.58	0.58
Clearance Time (s)	4.5	7.4	7.4	4.0	7.4	4.0	4.0	5.6	4.0	4.0	5.6	5.6
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	3.0	3.0	5.0	5.0
Lane Grp Cap (vph)	184	318	115	292	507	330	242	2603	1099	235	2603	922
v/s Ratio Prot	0.02	0.01		c0.09	0.04	c0.07	0.05	c0.47	0.02	0.07	0.35	
v/s Ratio Perm	0.03		0.00	c0.09		0.10	0.32		0.09	0.40		0.03
v/c Ratio	0.40	0.16	0.01	0.86	0.28	0.81	0.56	0.81	0.17	0.71	0.61	0.05
Uniform Delay, d1	42.9	45.3	46.5	39.9	41.4	40.8	13.4	18.2	6.0	26.0	15.0	10.0
Progression 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
Incremental Delay, d2	1.4	0.5	0.1	22.2	0.6	14.0	3.0	2.9	0.1	9.7	1.1	0.1
Delay (s)	44.3	45.8	46.6	62.0	42.1	54.8	16.4	21.1	6.0	35.7	16.1	10.1
Level of Service	D	D	D	E	D	D	B	C	A	D	B	B
Approach Delay (s)		45.1			54.8			19.3			17.6	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	108.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX

D 2016 TTS DATA SHEETS

Cross Tabulation Query Form - Trip - 2016

Row: Planning district of origin - pd_orig
Column: Planning district of destination - pd_dest
Table: Primary travel mode of trip - mode_prime

Filters:
Start time of trip - start_time In 600-900
and
Planning district of destination - pd_dest In 38,

Trip 2016
Table: Transit excluding GO rail

,Milton
PD 13 of Toronto,68
Milton,341

Trip 2016
Table: Cycle

,Milton
Milton,357

Trip 2016
Table: Auto driver

,Milton
PD 1 of Toronto,27
PD 2 of Toronto,43
PD 3 of Toronto,74
PD 4 of Toronto,123
PD 7 of Toronto,70
PD 8 of Toronto,192
PD 9 of Toronto,79
PD 10 of Toronto,48
PD 11 of Toronto,35
PD 12 of Toronto,13
PD 13 of Toronto,15
PD 15 of Toronto,16
Uxbridge,35
Pickering,42
Whitby,58
Oshawa,57
Georgina,29
East Gwillimbury,21
Richmond Hill,37
Markham,22
Vaughan,226

Caledon,41
Brampton,1052
Mississauga,2533
Halton Hills,1323
Milton,16041
Oakville,1225
Burlington,1744
Flamborough,446
Dundas,31
Glanbrook,93
Stoney Creek,70
Hamilton,621
Grimsby,52
Lincoln,46
St. Catharines,35
Niagara Falls,74
Waterloo,99
Kitchener,201
Cambridge,546
North Dumfries,111
Wilmot,15
City of Guelph,543
Puslinch,77
Guelph/Eramosa,160
Centre Wellington,16
Erin,136
Barrie,70
Innisfil,32
New Tecumseth,44
Oxford,26
Brant,45
Ramara,26
Shelburne,75
East Garafraxa,7
Brantford,6
External,85

Trip 2016
Table: Joint GO rail and local transit

,Milton
PD 1 of Toronto,14
Mississauga,5

Trip 2016
Table: Motorcycle

,Milton
PD 8 of Toronto,15

Trip 2016
Table: Other

,Milton
Milton,48

Trip 2016
Table: Auto passenger

,Milton
PD 3 of Toronto,14
PD 10 of Toronto,6
PD 12 of Toronto,44
PD 13 of Toronto,5
Pickering,9
Brampton,139
Mississauga,118
Halton Hills,189
Milton,3872
Oakville,74
Burlington,76
Hamilton,40
Cambridge,106
City of Guelph,33
Puslinch,6
Guelph/Eramosa,37
Erin,32
Barrie,66
New Tecumseth,44
External,8

Trip 2016
Table: School bus

,Milton
PD 13 of Toronto,40
Brampton,41
Mississauga,57
Halton Hills,142
Milton,2206
Burlington,137

Trip 2016
Table: Taxi passenger

,Milton
Milton,49

Trip 2016
Table: Paid rideshare

,Milton
Milton,14

Trip 2016
Table: Walk

,Milton
Milton,4453

Cross Tabulation Query Form - Trip - 2016

Row: Planning district of origin - pd_orig
Column: Planning district of destination - pd_dest
Table: Primary travel mode of trip - mode_prime

Filters:
Start time of trip - start_time In 600-900
and
Planning district of origin - pd_orig In 38,

Trip 2016
Table: Transit excluding GO rail

,PD 1 of Toronto,PD 3 of Toronto,PD 9 of Toronto,PD 10 of Toronto,PD 11 of Toronto,PD 13 of
Toronto,Brampton,Mississauga,Milton,Oakville,Hamilton,Waterloo,City of Guelph
Milton,160,13,65,201,138,32,37,126,341,90,98,60,132

Trip 2016
Table: Cycle

,Milton
Milton,357

Trip 2016
Table: Auto driver

,PD 1 of Toronto,PD 2 of Toronto,PD 3 of Toronto,PD 4 of Toronto,PD 5 of Toronto,PD 6 of Toronto,PD 7 of Toronto,PD 8 of Toronto,PD 9 of Toronto,PD 10 of Toronto,PD 11 of Toronto,PD 12 of Toronto,PD 13 of Toronto,PD 16 of
Toronto,Ajax,Whitby,Clarington,Newmarket,Richmond
Hill,Markham,King,Vaughan,Caledon,Brampton,Mississauga,Halton
Hills,Milton,Oakville,Burlington,Flamborough,Dundas,Glanbrook,Stoney
Creek,Hamilton,St. Catharines,Niagara
Falls,Waterloo,Kitchener,Cambridge,Wilmot,Woolwich,City of
Guelph,Puslinch,Guelph/Eramosa,Centre
Wellington,Erin,Barrie,Northumberland,Muskoka,Perth,Orillia,Brantford,External
Milton,532,36,100,65,48,32,99,568,716,220,300,81,68,136,15,14,18,62,71,321,23,777,154,3086,9856,704,16041,3260,1834,76,46,61,137,651,39,17,204,324,375,59,46,745,84,18,41,10,42,28,9,19,26,23,18

Trip 2016
Table: GO rail only

,PD 1 of Toronto,PD 2 of Toronto,PD 8 of Toronto,Mississauga
Milton,1127,8,8,10

Trip 2016

Table: Joint GO rail and local transit

,PD 1 of Toronto,PD 4 of Toronto,PD 6 of Toronto,PD 8 of Toronto,PD 9 of Toronto,PD 10 of Toronto,PD 13 of Toronto,Mississauga,Hamilton
Milton,520,64,27,15,13,33,5,43,28

Trip 2016
Table: Motorcycle

,Mississauga
Milton,17

Trip 2016
Table: Other

,Milton,Oakville
Milton,48,10

Trip 2016
Table: Auto passenger

,PD 1 of Toronto,PD 3 of Toronto,PD 7 of Toronto,PD 8 of Toronto,PD 9 of Toronto,PD 10 of Toronto,PD 13 of Toronto,Markham,Vaughan,Caledon,Brampton,Mississauga,Halton Hills,Milton,Oakville,Burlington,Flamborough,Stoney Creek,Hamilton,City of Guelph,Puslinch,Guelph/Eramosa,Barrie,Northumberland,Perth,Orillia
Milton,22,15,22,41,69,19,10,14,13,27,160,849,122,3872,336,144,22,3,73,75,17,18,82,28,26,11

Trip 2016
Table: School bus

,PD 4 of Toronto,PD 9 of Toronto,Mississauga,Halton Hills,Milton,Oakville
Milton,17,27,108,165,2206,369

Trip 2016
Table: Taxi passenger

,Mississauga,Milton
Milton,20,49

Trip 2016
Table: Paid rideshare

,Mississauga,Milton
Milton,71,14

Trip 2016
Table: Walk

,Mississauga,Milton,Waterloo

Milton,24,4453,17

Cross Tabulation Query Form - Trip - 2016

Row: Planning district of origin - pd_orig
Column: Planning district of destination - pd_dest
Table: Primary travel mode of trip - mode_prime

Filters:
Start time of trip - start_time In 1500-1700
and
Planning district of destination - pd_dest In 38,

Trip 2016
Table: Transit excluding GO rail

,Milton
PD 1 of Toronto,39
PD 3 of Toronto,13
PD 9 of Toronto,13
PD 10 of Toronto,143
PD 11 of Toronto,82
Mississauga,131
Milton,141
Oakville,90
Hamilton,51
Waterloo,60
City of Guelph,139

Trip 2016
Table: Cycle

,Milton
Milton,186

Trip 2016
Table: Auto driver

,Milton
PD 1 of Toronto,449
PD 2 of Toronto,90
PD 3 of Toronto,83
PD 4 of Toronto,56
PD 5 of Toronto,75
PD 6 of Toronto,10
PD 7 of Toronto,83
PD 8 of Toronto,368
PD 9 of Toronto,484
PD 10 of Toronto,236
PD 11 of Toronto,167
PD 12 of Toronto,70

PD 13 of Toronto,71
PD 16 of Toronto,126
Ajax,49
Whitby,33
Clarington,18
Georgina,27
Newmarket,23
Aurora,29
Richmond Hill,53
Whitchurch-Stouffville,23
Markham,154
King,23
Vaughan,729
Caledon,121
Brampton,2193
Mississauga,6908
Halton Hills,1043
Milton,13278
Oakville,2099
Burlington,1248
Flamborough,149
Stoney Creek,110
Hamilton,465
Niagara-on-the-Lake,36
Waterloo,193
Kitchener,191
Cambridge,378
Wilmot,59
Woolwich,16
City of Guelph,500
Puslinch,168
Guelph/Eramosa,51
Centre Wellington,22
Erin,105
Barrie,38
New Tecumseth,15
Grey,15
Perth,6
Orillia,15
Brantford,3
External,54

Trip 2016
Table: GO rail only

,Milton
PD 1 of Toronto,664
PD 2 of Toronto,8
Brampton,28

Trip 2016
Table: Joint GO rail and local transit

,Milton
PD 1 of Toronto,219
PD 4 of Toronto,24
PD 7 of Toronto,10
PD 8 of Toronto,3
PD 9 of Toronto,13
Mississauga,36
Hamilton,28

Trip 2016
Table: Motorcycle

,Milton
Mississauga,17

Trip 2016
Table: Other

,Milton
Milton,63

Trip 2016
Table: Auto passenger

,Milton
PD 1 of Toronto,27
PD 3 of Toronto,15
PD 7 of Toronto,22
PD 8 of Toronto,52
PD 10 of Toronto,27
Whitby,19
Vaughan,13
Caledon,27
Brampton,132
Mississauga,880
Halton Hills,364
Milton,3144
Oakville,314
Burlington,143
Flamborough,53
Dundas,32
Hamilton,53
Niagara-on-the-Lake,13
City of Guelph,87
Puslinch,17
Guelph/Eramosa,9
Erin,68

Barrie,60
New Tecumseth,15

Trip 2016
Table: School bus

,Milton
PD 4 of Toronto,17
PD 9 of Toronto,27
Mississauga,108
Halton Hills,133
Milton,1436
Oakville,219

Trip 2016
Table: Taxi passenger

,Milton
Mississauga,83

Trip 2016
Table: Paid rideshare

,Milton
Milton,58

Trip 2016
Table: Walk

,Milton
Milton,3447

Cross Tabulation Query Form - Trip - 2016

Row: Planning district of origin - pd_orig
Column: Planning district of destination - pd_dest
Table: Primary travel mode of trip - mode_prime

Filters:
Start time of trip - start_time In 1500-1700
and
Planning district of origin - pd_orig In 38,

Trip 2016
Table: Transit excluding GO rail

,PD 1 of Toronto,PD 13 of Toronto,Milton,Oakville
Milton,56,68,141,13

Trip 2016
Table: Cycle

,Milton
Milton,186

Trip 2016
Table: Auto driver

,PD 1 of Toronto,PD 2 of Toronto,PD 3 of Toronto,PD 4 of Toronto,PD 7 of Toronto,PD 8 of Toronto,PD 9 of Toronto,PD 10 of Toronto,PD 11 of Toronto,PD 12 of Toronto,PD 13 of Toronto,PD 16 of Toronto,Uxbridge,Pickering,Whitby,Oshawa,East Gwillimbury,Markham,Vaughan,Caledon,Brampton,Mississauga,Halton Hills,Milton,Oakville,Burlington,Flamborough,Glanbrook,Stoney Creek,Hamilton,Grimsby,Lincoln,West Lincoln,Waterloo,Kitchener,Cambridge,North Dumfries,City of Guelph,Puslinch,Guelph/Eramosa,Centre Wellington,Orangeville,Innisfil,New Tecumseth,Kawartha Lakes,Rest of Wellington,Brant,Ramara,Brantford
Milton,110,69,69,80,18,117,56,18,43,18,51,22,35,42,18,95,21,79,51,36,792,2229,971,13278,1185,1749,481,40,25,828,17,28,67,47,232,346,137,411,97,263,21,57,32,14,12,28,15,26,49

Trip 2016
Table: GO rail only

,PD 1 of Toronto
Milton,42

Trip 2016
Table: Other

,Milton

Milton,63

Trip 2016
Table: Auto passenger

,PD 1 of Toronto,PD 9 of Toronto,Vaughan,Caledon,Brampton,Mississauga,Halton Hills,Milton,Oakville,Burlington,Ancaster,Hamilton,Niagara Falls,City of Guelph,Guelph/Eramosa,Centre Wellington,Barrie,Innisfil,Brant
Milton,89,32,17,18,106,251,144,3144,95,157,10,181,3,5,106,21,66,67,33

Trip 2016
Table: School bus

,Mississauga,Halton Hills,Milton,Flamborough
Milton,57,90,1436,53

Trip 2016
Table: Paid rideshare

,Brampton,Milton
Milton,24,58

Trip 2016
Table: Walk

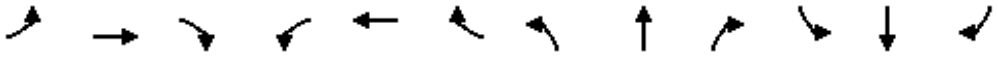
,Milton
Milton,3447

APPENDIX

E FUTURE BACKGROUND SYNCHRO OUTPUT REPORTS

Queues
1: Regional Road 25 & Britannia Road

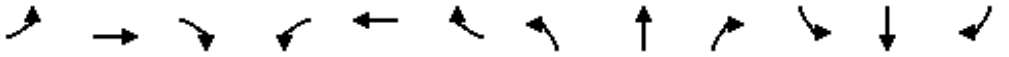
10-23-2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	310	1287	209	417	1056	83	350	1063	479	321	1406	173
v/c Ratio	0.81	0.96	0.34	0.99	0.76	0.15	0.93	0.70	0.68	0.84	0.93	0.28
Control Delay	75.0	62.7	8.3	100.7	46.4	5.6	90.1	41.4	23.2	78.1	54.7	5.5
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	75.0	62.7	8.3	100.7	46.4	5.6	90.1	41.4	23.2	78.1	54.7	5.5
Queue Length 50th (m)	42.0	140.5	4.0	58.0	106.2	0.0	48.4	101.8	53.8	43.9	150.3	0.0
Queue Length 95th (m)	#62.3	#175.2	22.7	#91.4	125.7	9.6	#76.7	120.8	94.2	#66.4	#184.0	15.5
Internal Link Dist (m)		239.5			177.4			308.0			325.9	
Turn Bay Length (m)	142.0		89.0	147.0		118.0	120.0		132.0	120.0		115.0
Base Capacity (vph)	390	1345	608	420	1395	559	378	1511	702	385	1509	623
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	0.79	0.96	0.34	0.99	0.76	0.15	0.93	0.70	0.68	0.83	0.93	0.28

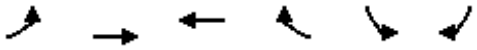
Intersection Summary

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



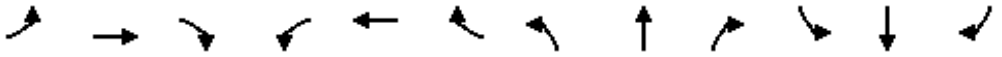
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	310	1287	209	417	1056	83	350	1063	479	321	1406	173
Future Volume (vph)	310	1287	209	417	1056	83	350	1063	479	321	1406	173
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	4.6	4.6	3.0	4.6	4.6
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3340	4520	1601	3340	4520	1601	3404	4391	1570	3471	4391	1484
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3340	4520	1601	3340	4520	1601	3404	4391	1570	3471	4391	1484
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	310	1287	209	417	1056	83	350	1063	479	321	1406	173
RTOR Reduction (vph)	0	0	132	0	0	57	0	0	162	0	0	114
Lane Group Flow (vph)	310	1287	77	417	1056	26	350	1063	317	321	1406	59
Heavy Vehicles (%)	6%	2%	2%	6%	2%	2%	4%	5%	4%	2%	5%	10%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	14.5	38.2	38.2	16.0	39.7	39.7	14.0	44.5	44.5	13.9	44.4	44.4
Effective Green, g (s)	15.5	40.2	40.2	17.0	41.7	41.7	15.0	46.5	46.5	14.9	46.4	46.4
Actuated g/C Ratio	0.11	0.30	0.30	0.13	0.31	0.31	0.11	0.34	0.34	0.11	0.34	0.34
Clearance Time (s)	4.0	7.8	7.8	4.0	7.8	7.8	4.0	6.6	6.6	4.0	6.6	6.6
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	3.2	3.2	3.0	3.2	3.2
Lane Grp Cap (vph)	383	1345	476	420	1396	494	378	1512	540	383	1509	510
v/s Ratio Prot	0.09	c0.28		c0.12	0.23		c0.10	0.24		0.09	c0.32	
v/s Ratio Perm			0.05			0.02			0.20			0.04
v/c Ratio	0.81	0.96	0.16	0.99	0.76	0.05	0.93	0.70	0.59	0.84	0.93	0.12
Uniform Delay, d1	58.3	46.5	35.0	58.9	42.1	32.8	59.4	38.3	36.4	58.9	42.8	30.3
Progression 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
Incremental Delay, d2	11.9	15.4	0.2	41.8	2.5	0.1	28.1	1.5	1.7	14.7	10.8	0.1
Delay (s)	70.2	61.9	35.2	100.8	44.6	32.8	87.6	39.8	38.0	73.6	53.5	30.4
Level of Service	E	E	D	F	D	C	F	D	D	E	D	C
Approach Delay (s)		60.3			59.0			48.2			54.8	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	55.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	89.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



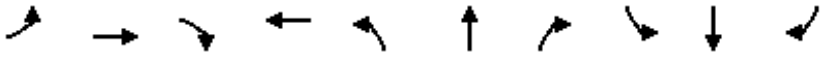
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	186	1932	1426	155	63	200
v/c Ratio	0.56	0.61	0.61	0.18	0.29	0.52
Control Delay	22.6	6.7	12.5	2.3	28.1	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.6	6.7	12.5	2.3	28.1	12.5
Queue Length 50th (m)	5.5	41.3	46.2	0.0	7.0	4.2
Queue Length 95th (m)	24.9	68.1	69.6	7.7	16.5	19.9
Internal Link Dist (m)		1174.8	1361.6			
Turn Bay Length (m)	130.0			85.0	85.0	85.0
Base Capacity (vph)	333	3151	2349	880	825	1002
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	0.56	0.61	0.61	0.18	0.08	0.20

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	186	1932	0	0	1426	155	0	0	0	63	0	200
Future Volume (vph)	186	1932	0	0	1426	155	0	0	0	63	0	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5			4.5	4.5				5.2		5.2
Lane Util. Factor	1.00	*0.80			*0.80	1.00				1.00		1.00
Frt	1.00	1.00			1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1789	4520			4391	1512				1772		1601
Flt Permitted	0.10	1.00			1.00	1.00				0.76		1.00
Satd. Flow (perm)	195	4520			4391	1512				1412		1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	186	1932	0	0	1426	155	0	0	0	63	0	200
RTOR Reduction (vph)	0	0	0	0	0	73	0	0	0	0	0	136
Lane Group Flow (vph)	186	1932	0	0	1426	82	0	0	0	63	0	64
Heavy Vehicles (%)	2%	2%	2%	2%	5%	8%	2%	2%	10%	3%	10%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm				Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	46.8	44.3			33.3	33.3				10.4		10.4
Effective Green, g (s)	47.8	46.3			35.3	35.3				10.4		10.4
Actuated g/C Ratio	0.72	0.70			0.53	0.53				0.16		0.16
Clearance Time (s)	4.0	6.5			6.5	6.5				5.2		5.2
Vehicle Extension (s)	3.0	5.0			5.0	5.0				5.0		5.0
Lane Grp Cap (vph)	332	3151			2334	803				221		250
v/s Ratio Prot	0.07	c0.43			0.32							
v/s Ratio Perm	0.34					0.05				c0.04		0.04
v/c Ratio	0.56	0.61			0.61	0.10				0.29		0.26
Uniform Delay, d1	13.4	5.3			10.8	7.7				24.7		24.6
Progression Factor	1.00	1.00			1.00	1.00				1.00		1.00
Incremental Delay, d2	2.2	0.5			0.7	0.1				1.5		1.1
Delay (s)	15.6	5.8			11.5	7.8				26.2		25.7
Level of Service	B	A			B	A				C		C
Approach Delay (s)		6.7			11.1			0.0			25.9	
Approach LOS		A			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	66.4	Sum of lost time (s)	10.7
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

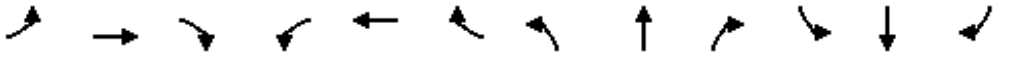


Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	49	2124	14	1085	239	63	240	389	139	279
v/c Ratio	0.18	0.77	0.01	0.47	0.76	0.18	0.61	1.02	0.39	0.70
Control Delay	10.4	18.4	0.0	17.0	47.3	35.9	21.3	87.1	39.6	26.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.4	18.4	0.0	17.0	47.3	35.9	21.3	87.1	39.6	26.9
Queue Length 50th (m)	3.3	117.0	0.0	54.4	38.2	10.7	14.9	~72.6	24.4	21.7
Queue Length 95th (m)	10.0	185.7	0.0	84.9	61.1	22.1	39.0	#118.9	42.4	49.9
Internal Link Dist (m)		1361.6		653.2		218.8			343.3	
Turn Bay Length (m)	85.0		85.0		85.0		85.0	85.0		85.0
Base Capacity (vph)	276	2753	1018	2730	315	713	675	381	721	672
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.77	0.01	0.40	0.76	0.09	0.36	1.02	0.19	0.42

Intersection Summary

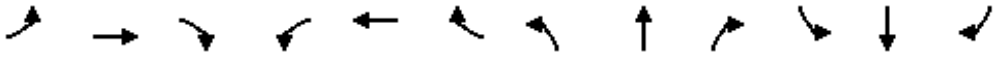
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	2124	14	0	1085	0	239	63	240	389	139	279
Future Volume (vph)	49	2124	14	0	1085	0	239	63	240	389	139	279
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9		4.9		4.5	3.2	5.2	4.5	3.2	5.2
Lane Util. Factor	1.00	*0.80	1.00		*0.80		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1738	4520	1601		4309		1789	1883	1601	1789	1883	1570
Flt Permitted	0.16	1.00	1.00		1.00		0.53	1.00	1.00	0.70	1.00	1.00
Satd. Flow (perm)	295	4520	1601		4309		1000	1883	1601	1317	1883	1570
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	49	2124	14	0	1085	0	239	63	240	389	139	279
RTOR Reduction (vph)	0	0	5	0	0	0	0	0	131	0	0	133
Lane Group Flow (vph)	49	2124	9	0	1085	0	239	63	109	389	139	146
Heavy Vehicles (%)	5%	2%	2%	2%	7%	5%	2%	2%	2%	2%	2%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	61.8	61.8	61.8		53.5		25.3	17.0	17.0	26.1	17.4	17.4
Effective Green, g (s)	62.8	63.8	63.8		55.5		25.3	19.0	17.0	26.1	19.4	17.4
Actuated g/C Ratio	0.60	0.61	0.61		0.53		0.24	0.18	0.16	0.25	0.19	0.17
Clearance Time (s)	4.0	6.9	6.9		6.9		4.5	5.2	5.2	4.5	5.2	5.2
Vehicle Extension (s)	3.0	5.0	5.0		5.0		3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	251	2770	981		2297		305	343	261	369	350	262
v/s Ratio Prot	0.01	c0.47			0.25		0.06	0.03		c0.09	0.07	
v/s Ratio Perm	0.11		0.01				0.13		0.07	c0.18		0.09
v/c Ratio	0.20	0.77	0.01		0.47		0.78	0.18	0.42	1.05	0.40	0.56
Uniform Delay, d1	9.6	14.7	7.8		15.2		35.8	36.0	39.1	38.2	37.2	39.8
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	1.6	0.0		0.3		12.4	0.5	2.3	61.8	1.5	4.3
Delay (s)	10.0	16.3	7.9		15.5		48.1	36.5	41.4	100.0	38.8	44.1
Level of Service	A	B	A		B		D	D	D	F	D	D
Approach Delay (s)		16.1			15.5			43.8			70.1	
Approach LOS		B			B			D			E	

Intersection Summary			
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	104.1	Sum of lost time (s)	15.6
Intersection Capacity Utilization	89.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

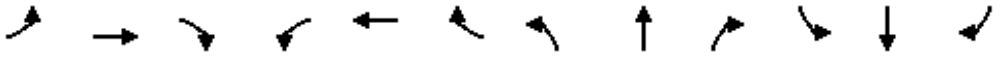


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	419	1772	563	219	868	186	398	1644	277	336	1168	180
v/c Ratio	0.88	1.03	0.72	0.98	0.67	0.31	0.82	1.05	0.43	1.04	0.86	0.31
Control Delay	78.8	70.9	23.2	120.3	46.1	6.3	73.3	80.4	20.0	122.0	53.8	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	78.8	70.9	23.2	120.3	46.1	6.3	73.3	80.4	20.0	122.0	53.8	8.0
Queue Length 50th (m)	59.2	~217.4	68.0	31.8	88.2	0.0	56.0	~205.7	29.6	~51.7	127.3	2.7
Queue Length 95th (m)	#85.7	#250.6	113.3	#58.1	106.1	17.3	#78.8	#239.2	54.8	#82.5	148.8	20.2
Internal Link Dist (m)		653.2			686.5			2451.0			163.2	
Turn Bay Length (m)	130.0		85.0	85.0		95.0	85.0		85.0	230.0		85.0
Base Capacity (vph)	482	1727	786	223	1292	596	484	1569	641	322	1359	583
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	0.87	1.03	0.72	0.98	0.67	0.31	0.82	1.05	0.43	1.04	0.86	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.



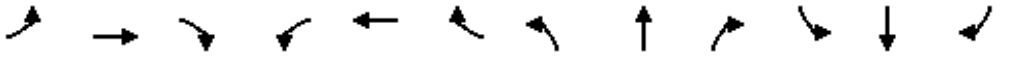
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	419	1772	563	219	868	186	398	1644	277	336	1168	180
Future Volume (vph)	419	1772	563	219	868	186	398	1644	277	336	1168	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.4	5.4	3.0	5.4	5.4
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3248	4520	1601	3471	4309	1555	3471	4520	1601	3471	4520	1555
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3248	4520	1601	3471	4309	1555	3471	4520	1601	3471	4520	1555
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	419	1772	563	219	868	186	398	1644	277	336	1168	180
RTOR Reduction (vph)	0	0	175	0	0	130	0	0	86	0	0	116
Lane Group Flow (vph)	419	1772	388	219	868	56	398	1644	191	336	1168	64
Heavy Vehicles (%)	9%	2%	2%	2%	7%	5%	2%	2%	2%	2%	2%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	19.5	51.5	51.5	8.0	40.0	40.0	18.5	46.6	46.6	12.0	40.1	40.1
Effective Green, g (s)	20.5	53.5	53.5	9.0	42.0	42.0	19.5	48.6	48.6	13.0	42.1	42.1
Actuated g/C Ratio	0.15	0.38	0.38	0.06	0.30	0.30	0.14	0.35	0.35	0.09	0.30	0.30
Clearance Time (s)	4.0	6.5	6.5	4.0	6.5	6.5	4.0	7.4	7.4	4.0	7.4	7.4
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	5.0	5.0
Lane Grp Cap (vph)	475	1727	611	223	1292	466	483	1569	555	322	1359	467
v/s Ratio Prot	c0.13	c0.39		c0.06	0.20		0.11	c0.36		c0.10	0.26	
v/s Ratio Perm			0.24			0.04			0.12			0.04
v/c Ratio	0.88	1.03	0.64	0.98	0.67	0.12	0.82	1.05	0.34	1.04	0.86	0.14
Uniform Delay, d1	58.6	43.2	35.3	65.4	43.0	35.6	58.6	45.7	33.9	63.5	46.2	35.7
Progression 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
Incremental Delay, d2	17.3	28.6	3.0	54.9	1.8	0.2	10.9	36.4	0.4	61.9	6.2	0.3
Delay (s)	75.8	71.8	38.3	120.3	44.8	35.8	69.5	82.1	34.3	125.4	52.4	36.0
Level of Service	E	E	D	F	D	D	E	F	C	F	D	D
Approach Delay (s)		65.6			56.5			74.2			65.2	
Approach LOS		E			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	66.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.9
Intersection Capacity Utilization	96.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	395	1978	12	1	954	120	67	480	17	95	251
v/c Ratio	0.96	0.78	0.01	0.01	0.59	0.18	0.16	0.80	0.17	0.15	0.37
Control Delay	58.8	21.0	0.0	10.0	27.3	4.8	25.0	39.2	29.2	23.9	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.8	21.0	0.0	10.0	27.3	4.8	25.0	39.2	29.2	23.9	5.0
Queue Length 50th (m)	54.2	119.7	0.0	0.1	63.5	0.0	8.8	75.8	2.3	12.3	0.0
Queue Length 95th (m)	#123.2	183.3	0.0	0.8	81.5	11.1	20.1	125.0	8.3	25.4	16.6
Internal Link Dist (m)		686.5			658.0			300.4		386.3	
Turn Bay Length (m)	125.0		85.0	135.0		85.0	122.0				85.0
Base Capacity (vph)	411	2557	924	194	1896	765	504	702	121	730	762
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.77	0.01	0.01	0.50	0.16	0.13	0.68	0.14	0.13	0.33

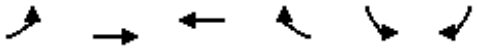
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	395	1978	12	1	954	120	67	297	183	17	95	251
Future Volume (vph)	395	1978	12	1	954	120	67	297	183	17	95	251
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.5	3.5		4.5	3.5	5.5
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1674	4520	1585	1789	4350	1601	1789	1713		1789	1830	1601
Flt Permitted	0.15	1.00	1.00	0.10	1.00	1.00	0.69	1.00		0.17	1.00	1.00
Satd. Flow (perm)	273	4520	1585	194	4350	1601	1297	1713		312	1830	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	395	1978	12	1	954	120	67	297	183	17	95	251
RTOR Reduction (vph)	0	0	5	0	0	73	0	21	0	0	0	174
Lane Group Flow (vph)	395	1978	7	1	954	47	67	459	0	17	95	77
Heavy Vehicles (%)	9%	2%	3%	2%	6%	2%	2%	8%	2%	2%	5%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	58.5	53.5	53.5	38.9	37.9	37.9	31.4	31.4		31.4	31.4	31.4
Effective Green, g (s)	59.5	55.5	55.5	40.9	39.9	39.9	32.4	33.4		32.4	33.4	31.4
Actuated g/C Ratio	0.58	0.54	0.54	0.40	0.39	0.39	0.32	0.33		0.32	0.33	0.31
Clearance Time (s)	4.0	6.5	6.5	4.0	6.5	6.5	5.5	5.5		5.5	5.5	5.5
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	5.0	5.0		5.0	5.0	5.0
Lane Grp Cap (vph)	401	2461	863	109	1703	626	412	561		99	599	493
v/s Ratio Prot	c0.17	0.44		0.00	0.22			c0.27			0.05	
v/s Ratio Perm	c0.41		0.00	0.00		0.03	0.05			0.05		0.05
v/c Ratio	0.99	0.80	0.01	0.01	0.56	0.08	0.16	0.82		0.17	0.16	0.16
Uniform Delay, d1	23.8	18.8	10.6	20.1	24.2	19.4	25.0	31.5		25.1	24.3	25.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	40.6	2.1	0.0	0.0	0.5	0.1	0.4	10.2		1.7	0.3	0.3
Delay (s)	64.5	20.9	10.6	20.1	24.7	19.5	25.4	41.7		26.8	24.5	25.9
Level of Service	E	C	B	C	C	B	C	D		C	C	C
Approach Delay (s)		28.1			24.1			39.7			25.6	
Approach LOS		C			C			D			C	

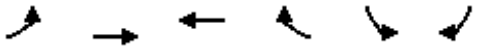
Intersection Summary			
HCM 2000 Control Delay	28.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	101.9	Sum of lost time (s)	11.0
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	373	1805	998	474	363	78
v/c Ratio	0.84	0.61	0.54	0.54	0.41	0.17
Control Delay	30.0	11.0	19.3	4.4	23.2	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	11.0	19.3	4.4	23.2	6.6
Queue Length 50th (m)	22.6	51.7	37.3	0.0	20.3	0.0
Queue Length 95th (m)	#66.2	64.5	49.0	17.1	31.2	8.8
Internal Link Dist (m)		658.0	685.0		264.0	
Turn Bay Length (m)	125.0			85.0		
Base Capacity (vph)	442	2938	1836	876	892	469
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	0.84	0.61	0.54	0.54	0.41	0.17

Intersection Summary

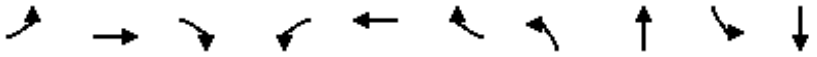
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	373	1805	998	474	363	78
Future Volume (vph)	373	1805	998	474	363	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.5	6.5	6.5	5.5	5.5
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1789	5142	5142	1601	3471	1601
Flt Permitted	0.19	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	358	5142	5142	1601	3471	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	373	1805	998	474	363	78
RTOR Reduction (vph)	0	0	0	305	0	58
Lane Group Flow (vph)	373	1805	998	169	363	20
Turn Type	pm+pt	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases	2			6	4	4
Actuated Green, G (s)	40.0	40.0	25.0	25.0	18.0	18.0
Effective Green, g (s)	40.0	40.0	25.0	25.0	18.0	18.0
Actuated g/C Ratio	0.57	0.57	0.36	0.36	0.26	0.26
Clearance Time (s)	4.0	6.5	6.5	6.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	429	2938	1836	571	892	411
v/s Ratio Prot	c0.14	0.35	0.19			
v/s Ratio Perm	c0.36			0.11	c0.10	0.01
v/c Ratio	0.87	0.61	0.54	0.30	0.41	0.05
Uniform Delay, d1	10.8	9.9	17.9	16.2	21.6	19.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	16.9	0.4	0.3	0.3	1.4	0.2
Delay (s)	27.7	10.3	18.3	16.5	22.9	19.8
Level of Service	C	B	B	B	C	B
Approach Delay (s)		13.3	17.7		22.4	
Approach LOS		B	B		C	

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

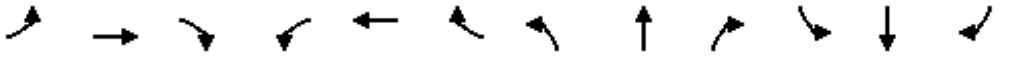
c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	135	1912	120	69	1203	498	268	383	357	161
v/c Ratio	0.56	0.90	0.16	0.38	0.65	0.51	0.89	0.52	0.72	0.51
Control Delay	23.5	36.7	7.8	19.4	28.5	4.3	78.5	43.1	56.2	49.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.5	36.7	7.8	19.4	28.5	4.3	78.5	43.1	56.2	49.2
Queue Length 50th (m)	13.7	165.7	4.2	6.7	86.9	0.9	59.9	40.7	39.9	33.6
Queue Length 95th (m)	29.5	#231.3	16.2	15.3	118.0	21.7	#117.2	56.9	58.2	54.4
Internal Link Dist (m)		685.0			1030.1			436.1		413.0
Turn Bay Length (m)	85.0		85.0	85.0		85.0	85.0		85.0	
Base Capacity (vph)	260	2114	739	183	1886	976	300	1251	580	618
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.90	0.16	0.38	0.64	0.51	0.89	0.31	0.62	0.26

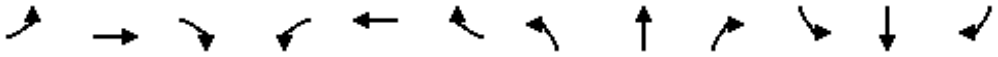
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	1912	120	69	1203	498	268	361	22	357	161	0
Future Volume (vph)	135	1912	120	69	1203	498	268	361	22	357	161	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.5	3.2		4.5	3.2	
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	0.95		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1789	4520	1484	1706	4309	1601	1690	3548		3471	1812	
Flt Permitted	0.10	1.00	1.00	0.08	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	192	4520	1484	146	4309	1601	1690	3548		3471	1812	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	135	1912	120	69	1203	498	268	361	22	357	161	0
RTOR Reduction (vph)	0	0	46	0	0	278	0	4	0	0	0	0
Lane Group Flow (vph)	135	1912	74	69	1203	220	268	379	0	357	161	0
Heavy Vehicles (%)	2%	2%	10%	7%	7%	2%	8%	2%	2%	2%	6%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6						4
Actuated Green, G (s)	60.5	51.6	51.6	53.7	48.2	48.2	20.4	21.8		16.4	17.8	
Effective Green, g (s)	62.1	53.6	53.6	55.7	50.2	50.2	20.4	23.8		16.4	19.8	
Actuated g/C Ratio	0.54	0.46	0.46	0.48	0.43	0.43	0.18	0.21		0.14	0.17	
Clearance Time (s)	4.0	6.5	6.5	4.0	6.5	6.5	4.5	5.2		4.5	5.2	
Vehicle Extension (s)	2.5	5.0	5.0	2.5	5.0	5.0	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	240	2097	688	158	1872	695	298	731		492	310	
v/s Ratio Prot	c0.05	c0.42		0.02	0.28		c0.16	c0.11		0.10	0.09	
v/s Ratio Perm	0.25		0.05	0.19		0.14						
v/c Ratio	0.56	0.91	0.11	0.44	0.64	0.32	0.90	0.52		0.73	0.52	
Uniform Delay, d1	17.3	28.8	17.5	24.1	25.6	21.4	46.5	40.8		47.4	43.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.4	6.9	0.1	1.4	1.0	0.6	27.6	1.2		5.3	2.9	
Delay (s)	19.7	35.6	17.6	25.5	26.7	22.0	74.2	42.0		52.7	46.4	
Level of Service	B	D	B	C	C	C	E	D		D	D	
Approach Delay (s)		33.6			25.3			55.2			50.7	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	35.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	115.5	Sum of lost time (s)	15.2
Intersection Capacity Utilization	80.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	137	1660	491	254	1164	255	517	1731	505	624	1875	119
v/c Ratio	0.70	1.21	0.74	1.10	0.86	0.42	1.09	1.19	0.82	1.05	1.17	0.20
Control Delay	81.5	140.7	25.3	145.0	51.6	10.3	119.4	133.0	43.0	104.1	124.0	9.0
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	81.5	140.7	25.3	145.0	51.6	10.3	119.4	133.0	43.0	104.1	124.0	9.0
Queue Length 50th (m)	18.8	~224.0	52.9	~39.4	121.7	8.9	~79.4	~231.5	96.7	~93.2	~248.2	3.9
Queue Length 95th (m)	#32.5	#257.5	96.7	#66.8	143.5	31.2	#114.2	#265.0	#148.1	#129.7	#281.3	17.1
Internal Link Dist (m)		309.3			173.0			421.7			476.7	
Turn Bay Length (m)	50.0		70.0	90.0		70.0	165.0		70.0	140.0		70.0
Base Capacity (vph)	195	1376	662	231	1350	608	476	1453	616	593	1597	600
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	0.70	1.21	0.74	1.10	0.86	0.42	1.09	1.19	0.82	1.05	1.17	0.20

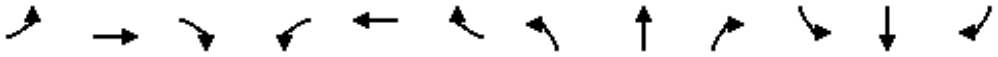
Intersection Summary

~ 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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	137	1660	491	254	1164	255	517	1731	505	624	1875	119
Future Volume (vph)	137	1660	491	254	1164	255	517	1731	505	624	1875	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3219	4520	1541	3471	4350	1498	3219	4350	1601	3340	4391	1484
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3219	4520	1541	3471	4350	1498	3219	4350	1601	3340	4391	1484
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	137	1660	491	254	1164	255	517	1731	505	624	1875	119
RTOR Reduction (vph)	0	0	193	0	0	143	0	0	82	0	0	61
Lane Group Flow (vph)	137	1660	298	254	1164	112	517	1731	423	624	1875	58
Heavy Vehicles (%)	10%	2%	6%	2%	6%	9%	10%	6%	2%	6%	5%	10%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	7.2	39.1	39.1	8.0	39.9	39.9	19.0	43.1	43.1	23.0	47.1	47.1
Effective Green, g (s)	8.2	41.1	41.1	9.0	41.9	41.9	20.0	45.1	45.1	24.0	49.1	49.1
Actuated g/C Ratio	0.06	0.30	0.30	0.07	0.31	0.31	0.15	0.33	0.33	0.18	0.36	0.36
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	195	1376	469	231	1350	464	476	1453	534	593	1597	539
v/s Ratio Prot	0.04	c0.37		c0.07	0.27		c0.16	0.40		c0.19	c0.43	
v/s Ratio Perm			0.19			0.07			0.26			0.04
v/c Ratio	0.70	1.21	0.63	1.10	0.86	0.24	1.09	1.19	0.79	1.05	1.17	0.11
Uniform Delay, d1	62.2	47.0	40.5	63.0	43.8	34.7	57.5	45.0	40.7	55.5	42.9	28.4
Progression 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
Incremental Delay, d2	10.9	100.0	3.2	88.4	6.1	0.4	66.5	93.2	9.0	51.5	85.3	0.2
Delay (s)	73.1	146.9	43.6	151.4	49.9	35.1	124.0	138.2	49.7	107.0	128.3	28.6
Level of Service	E	F	D	F	D	D	F	F	D	F	F	C
Approach Delay (s)		120.3			63.1			119.3			118.7	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	109.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	15.8
Intersection Capacity Utilization	105.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

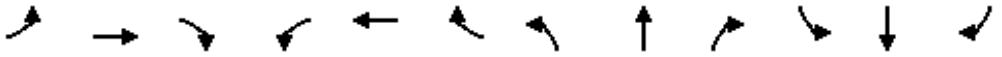


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	393	1157	389	267	698	153	207	1813	228	166	1027	231
v/c Ratio	0.72	0.88	0.56	0.79	0.64	0.26	0.63	1.08	0.33	0.85	0.71	0.35
Control Delay	65.0	51.2	22.0	79.7	46.1	6.6	70.7	88.8	13.5	101.1	45.9	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.0	51.2	22.0	79.7	46.1	6.6	70.7	88.8	13.5	101.1	45.9	5.7
Queue Length 50th (m)	56.0	160.0	47.1	39.2	89.3	0.0	29.8	~245.6	16.1	24.8	109.6	0.0
Queue Length 95th (m)	70.7	189.1	79.2	#58.6	116.5	16.5	43.5	#278.6	37.0	#45.8	128.9	18.6
Internal Link Dist (m)		214.6			322.8			302.9			114.0	
Turn Bay Length (m)	85.0		140.0	85.0		85.0	115.0		85.0	85.0		85.0
Base Capacity (vph)	726	1382	726	347	1096	596	340	1681	685	195	1444	666
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	0.54	0.84	0.54	0.77	0.64	0.26	0.61	1.08	0.33	0.85	0.71	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.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	393	1157	389	267	698	153	207	1813	228	166	1027	231
Future Volume (vph)	393	1157	389	267	698	153	207	1813	228	166	1027	231
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.8	3.8	3.0	3.8	3.8	3.0	5.4	5.4	3.0	5.4	5.4
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3437	3579	1601	3471	3579	1601	3219	4520	1601	3471	4433	1570
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3437	3579	1601	3471	3579	1601	3219	4520	1601	3471	4433	1570
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	393	1157	389	267	698	153	207	1813	228	166	1027	231
RTOR Reduction (vph)	0	0	111	0	0	106	0	0	90	0	0	156
Lane Group Flow (vph)	393	1157	278	267	698	47	207	1813	138	166	1027	75
Heavy Vehicles (%)	3%	2%	2%	2%	2%	2%	10%	2%	2%	2%	4%	4%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	21.5	50.1	50.1	12.9	41.5	41.5	13.6	50.9	50.9	7.0	44.3	44.3
Effective Green, g (s)	22.5	52.1	52.1	13.9	43.5	43.5	14.6	52.9	52.9	8.0	46.3	46.3
Actuated g/C Ratio	0.16	0.37	0.37	0.10	0.31	0.31	0.10	0.37	0.37	0.06	0.33	0.33
Clearance Time (s)	4.0	5.8	5.8	4.0	5.8	5.8	4.0	7.4	7.4	4.0	7.4	7.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	544	1312	586	339	1095	490	330	1682	596	195	1444	511
v/s Ratio Prot	c0.11	c0.32		c0.08	0.20		0.06	c0.40		c0.05	0.23	
v/s Ratio Perm			0.17			0.03			0.09			0.05
v/c Ratio	0.72	0.88	0.47	0.79	0.64	0.10	0.63	1.08	0.23	0.85	0.71	0.15
Uniform Delay, d1	56.8	42.1	34.5	62.7	42.5	35.2	61.1	44.6	30.6	66.5	42.0	33.9
Progression 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
Incremental Delay, d2	4.7	7.3	0.6	11.5	1.2	0.1	5.2	46.3	0.4	28.2	2.1	0.3
Delay (s)	61.5	49.4	35.1	74.1	43.7	35.3	66.3	90.9	31.0	94.7	44.1	34.2
Level of Service	E	D	D	E	D	D	E	F	C	F	D	C
Approach Delay (s)		49.0			49.8			82.5			48.4	
Approach LOS		D			D			F			D	

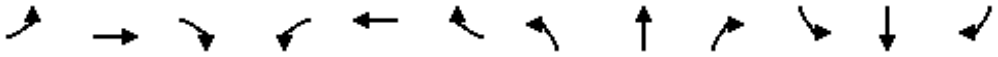
Intersection Summary			
HCM 2000 Control Delay	60.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	142.1	Sum of lost time (s)	15.2
Intersection Capacity Utilization	93.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	262	41	663	231	47	32	2016	71	180	1745	25
v/c Ratio	0.56	0.06	1.08	0.49	0.08	0.21	1.00	0.10	1.00	0.78	0.03
Control Delay	35.4	25.0	90.1	33.3	9.2	13.6	51.4	6.0	92.4	26.4	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.4	25.0	90.1	33.3	9.2	13.6	51.4	6.0	92.4	26.4	0.3
Queue Length 50th (m)	45.6	5.9	~143.5	39.0	0.7	2.8	~176.5	1.2	~23.8	132.7	0.0
Queue Length 95th (m)	72.2	13.5	#212.8	62.8	8.6	6.9	#221.7	9.0	#68.1	156.6	0.6
Internal Link Dist (m)		483.8			361.2		451.9			2451.0	
Turn Bay Length (m)	85.0		85.0	85.0		85.0		85.0	85.0		85.0
Base Capacity (vph)	464	640	614	467	582	151	2013	747	180	2247	826
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.06	1.08	0.49	0.08	0.21	1.00	0.10	1.00	0.78	0.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

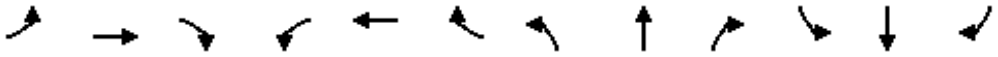
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	262	41	663	231	5	42	32	2016	71	180	1745	25
Future Volume (vph)	262	41	663	231	5	42	32	2016	71	180	1745	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6		4.5	7.6	7.6	4.5	7.6	7.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	1883	1601	1789	1631		1789	4520	1601	1789	4520	1601
Flt Permitted	0.73	1.00	1.00	0.73	1.00		0.08	1.00	1.00	0.07	1.00	1.00
Satd. Flow (perm)	1368	1883	1601	1376	1631		148	4520	1601	138	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	262	41	663	231	5	42	32	2016	71	180	1745	25
RTOR Reduction (vph)	0	0	71	0	28	0	0	0	33	0	0	13
Lane Group Flow (vph)	262	41	592	231	19	0	32	2016	38	180	1745	12
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	37.4	37.4	37.4	37.4	37.4		53.8	50.8	50.8	61.6	54.7	54.7
Effective Green, g (s)	37.4	37.4	37.4	37.4	37.4		53.8	50.8	50.8	61.6	54.7	54.7
Actuated g/C Ratio	0.33	0.33	0.33	0.33	0.33		0.48	0.45	0.45	0.55	0.49	0.49
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6		4.5	7.6	7.6	4.5	7.6	7.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	457	629	535	460	545		115	2053	727	177	2211	783
v/s Ratio Prot		0.02			0.01		0.01	0.45		c0.06	0.39	
v/s Ratio Perm	0.19		c0.37	0.17			0.13		0.02	c0.50		0.01
v/c Ratio	0.57	0.07	1.11	0.50	0.03		0.28	0.98	0.05	1.02	0.79	0.02
Uniform Delay, d1	30.6	25.3	37.2	29.8	25.0		19.0	30.0	17.0	31.1	23.8	14.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.7	0.0	71.7	0.9	0.0		1.3	16.0	0.1	72.1	3.0	0.0
Delay (s)	32.4	25.4	108.9	30.6	25.1		20.3	46.1	17.2	103.2	26.7	14.7
Level of Service	C	C	F	C	C		C	D	B	F	C	B
Approach Delay (s)		84.6			29.7			44.7			33.6	
Approach LOS		F			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	47.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	111.8	Sum of lost time (s)	16.7
Intersection Capacity Utilization	101.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

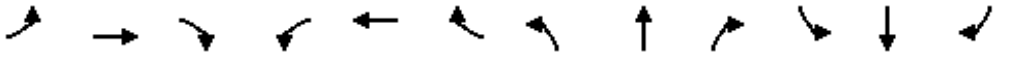


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	46	2142	368	211	1296	749	464	1772	890	218	1032	66
v/c Ratio	0.23	1.24	0.50	0.64	0.68	0.82	1.26	1.20	1.11	1.08	0.82	0.12
Control Delay	63.5	149.7	15.2	68.3	33.5	31.4	186.3	134.3	97.2	145.6	51.2	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.5	149.7	15.2	68.3	33.5	31.4	186.3	134.3	97.2	145.6	51.2	0.5
Queue Length 50th (m)	6.1	~294.7	29.6	28.4	117.5	147.5	~79.8	~237.6	~260.4	~33.4	107.1	0.0
Queue Length 95th (m)	12.7	#326.9	58.2	41.6	137.4	211.4	#113.5	#271.1	#338.5	#59.3	127.5	0.0
Internal Link Dist (m)		888.5			759.7			657.0			690.8	
Turn Bay Length (m)	130.0		110.0	300.0		70.0	110.0		70.0	130.0		85.0
Base Capacity (vph)	201	1727	742	330	1894	915	367	1482	803	201	1256	548
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	0.23	1.24	0.50	0.64	0.68	0.82	1.26	1.20	1.11	1.08	0.82	0.12

Intersection Summary

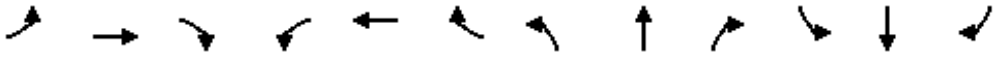
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	2142	368	211	1296	749	464	1772	890	218	1032	66
Future Volume (vph)	46	2142	368	211	1296	749	464	1772	890	218	1032	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.8	5.8	3.0	5.8	2.0	3.0	4.6	2.0	3.0	4.6	4.6
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3404	4520	1601	3437	4350	1601	3309	4350	1601	3404	4350	1484
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3404	4520	1601	3437	4350	1601	3309	4350	1601	3404	4350	1484
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	46	2142	368	211	1296	749	464	1772	890	218	1032	66
RTOR Reduction (vph)	0	0	130	0	0	47	0	0	40	0	0	47
Lane Group Flow (vph)	46	2142	238	211	1296	702	464	1772	850	218	1032	19
Heavy Vehicles (%)	4%	2%	2%	3%	6%	2%	7%	6%	2%	4%	6%	10%
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6	7	3	8	1	7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	5.6	50.4	50.4	12.0	56.8	63.8	14.0	44.0	56.0	7.0	37.0	37.0
Effective Green, g (s)	6.6	52.4	52.4	13.0	58.8	67.8	15.0	46.0	60.0	8.0	39.0	39.0
Actuated g/C Ratio	0.05	0.39	0.39	0.10	0.43	0.50	0.11	0.34	0.44	0.06	0.29	0.29
Clearance Time (s)	4.0	7.8	7.8	4.0	7.8	4.0	4.0	6.6	4.0	4.0	6.6	6.6
Vehicle Extension (s)	5.0	3.0	3.0	5.0	3.0	4.0	4.0	5.0	5.0	4.0	5.0	5.0
Lane Grp Cap (vph)	165	1744	617	329	1883	799	365	1473	707	200	1249	426
v/s Ratio Prot	0.01	c0.47		0.06	0.30	0.06	c0.14	c0.41	c0.12	0.06	0.24	
v/s Ratio Perm			0.15			0.38			0.41			0.01
v/c Ratio	0.28	1.23	0.39	0.64	0.69	0.88	1.27	1.20	1.20	1.09	0.83	0.04
Uniform Delay, d1	62.3	41.7	30.1	59.2	31.1	30.3	60.4	44.9	37.9	63.9	45.2	34.9
Progression 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
Incremental Delay, d2	1.9	108.0	0.4	5.7	1.1	11.1	141.9	98.1	104.4	89.7	5.2	0.1
Delay (s)	64.2	149.7	30.5	64.9	32.2	41.4	202.3	143.0	142.3	153.6	50.4	35.0
Level of Service	E	F	C	E	C	D	F	F	F	F	D	D
Approach Delay (s)		131.0			38.3			151.6			66.7	
Approach LOS		F			D			F			E	

Intersection Summary			
HCM 2000 Control Delay	106.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.25		
Actuated Cycle Length (s)	135.8	Sum of lost time (s)	16.4
Intersection Capacity Utilization	114.2%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

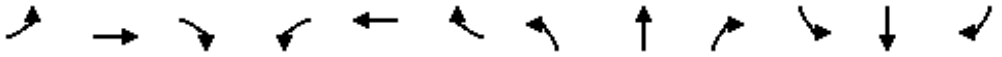


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	124	193	145	373	22	77	1	1868	253	358	2807	130
v/c Ratio	0.39	0.54	0.58	1.14	0.05	0.28	0.01	0.84	0.28	1.04	0.94	0.12
Control Delay	41.0	57.5	19.8	134.6	46.5	2.7	7.0	30.4	5.0	95.0	25.2	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.0	57.5	19.8	134.6	46.5	2.7	7.0	30.4	5.0	95.0	25.2	2.2
Queue Length 50th (m)	23.7	23.1	1.8	~86.9	2.4	0.0	0.1	153.3	6.4	~75.9	209.0	0.9
Queue Length 95th (m)	40.5	35.2	21.5	#152.7	6.4	0.7	0.6	178.0	19.8	#134.2	#326.3	8.5
Internal Link Dist (m)		1074.9			770.5			396.6			272.1	
Turn Bay Length (m)	85.0		85.0	120.0		85.0	170.0		70.0	170.0		70.0
Base Capacity (vph)	319	357	252	327	448	285	154	2216	900	345	2996	1040
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	0.39	0.54	0.58	1.14	0.05	0.27	0.01	0.84	0.28	1.04	0.94	0.13

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.

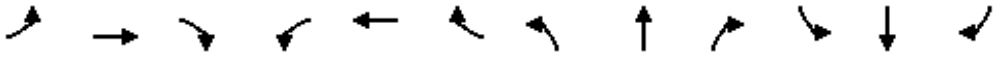


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	124	193	145	373	22	77	1	1868	253	358	2807	130
Future Volume (vph)	124	193	145	373	22	77	1	1868	253	358	2807	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.4	7.4	3.0	5.4	7.4	3.0	3.6	3.6	3.0	3.6	3.6
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	3579	1526	1789	3544	1484	1755	4433	1601	1722	4433	1484
Flt Permitted	0.69	1.00	1.00	0.61	1.00	1.00	0.06	1.00	1.00	0.06	1.00	1.00
Satd. Flow (perm)	1297	3579	1526	1151	3544	1484	119	4433	1601	111	4433	1484
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	124	193	145	373	22	77	1	1868	253	358	2807	130
RTOR Reduction (vph)	0	0	124	0	0	70	0	0	98	0	0	41
Lane Group Flow (vph)	124	193	21	373	22	7	1	1868	155	358	2807	89
Heavy Vehicles (%)	2%	2%	7%	2%	3%	10%	4%	4%	2%	6%	4%	10%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	8		3	4		5	2		1	6	
Permitted Phases	8		8	4		4	2		2	6		6
Actuated Green, G (s)	23.9	11.5	11.5	22.6	10.6	10.6	62.3	61.2	61.2	84.2	79.1	79.1
Effective Green, g (s)	25.9	13.5	11.5	24.6	12.6	10.6	64.3	63.2	63.2	85.2	81.1	81.1
Actuated g/C Ratio	0.21	0.11	0.09	0.20	0.10	0.09	0.52	0.51	0.51	0.68	0.65	0.65
Clearance Time (s)	4.5	7.4	7.4	4.0	7.4	7.4	4.0	5.6	5.6	4.0	5.6	5.6
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	322	387	140	293	358	126	88	2246	811	334	2883	965
v/s Ratio Prot	0.04	0.05		c0.13	0.01		0.00	0.42		c0.17	0.63	
v/s Ratio Perm	0.04		0.01	c0.12		0.00	0.01		0.10	c0.56		0.06
v/c Ratio	0.39	0.50	0.15	1.27	0.06	0.05	0.01	0.83	0.19	1.07	0.97	0.09
Uniform Delay, d1	42.1	52.4	52.1	48.8	50.7	52.4	28.2	26.2	16.8	42.1	20.8	8.1
Progression 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
Incremental Delay, d2	0.8	2.1	1.0	146.8	0.2	0.4	0.1	3.8	0.5	69.7	11.6	0.2
Delay (s)	42.8	54.5	53.1	195.6	50.9	52.8	28.3	30.0	17.3	111.7	32.4	8.3
Level of Service	D	D	D	F	D	D	C	C	B	F	C	A
Approach Delay (s)		50.9			165.6			28.5			40.1	
Approach LOS		D			F			C			D	

Intersection Summary			
HCM 2000 Control Delay	46.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	124.7	Sum of lost time (s)	15.5
Intersection Capacity Utilization	101.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Queues
1: Regional Road 25 & Britannia Road

10-23-2024

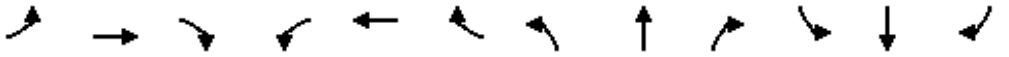


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	303	975	279	483	1159	287	245	1607	611	285	988	341
v/c Ratio	0.81	0.76	0.48	1.04	0.84	0.47	0.66	0.95	0.80	1.01	0.64	0.46
Control Delay	75.1	48.2	16.6	108.2	49.9	18.1	66.4	54.3	29.5	115.7	39.0	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.1	48.2	16.6	108.2	49.9	18.1	66.4	54.3	29.5	115.7	39.0	10.1
Queue Length 50th (m)	41.1	98.5	19.9	~71.7	119.9	24.7	32.5	172.9	87.6	~40.2	92.7	13.4
Queue Length 95th (m)	#61.4	117.3	46.3	#105.9	140.7	51.3	46.5	#210.7	140.0	#69.4	110.6	39.0
Internal Link Dist (m)		239.5			177.4			308.0			325.9	
Turn Bay Length (m)	142.0		89.0	147.0		118.0	120.0		132.0	120.0		115.0
Base Capacity (vph)	383	1312	593	464	1399	610	400	1685	767	283	1555	736
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	0.79	0.74	0.47	1.04	0.83	0.47	0.61	0.95	0.80	1.01	0.64	0.46

Intersection Summary

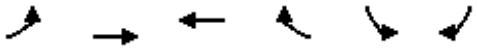
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	303	975	279	483	1159	287	245	1607	611	285	988	341
Future Volume (vph)	303	975	279	483	1159	287	245	1607	611	285	988	341
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	4.6	4.6	3.0	4.6	4.6
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3340	4520	1601	3471	4520	1601	3471	4476	1601	3471	4433	1601
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3340	4520	1601	3471	4520	1601	3471	4476	1601	3471	4433	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	303	975	279	483	1159	287	245	1607	611	285	988	341
RTOR Reduction (vph)	0	0	129	0	0	115	0	0	165	0	0	174
Lane Group Flow (vph)	303	975	150	483	1159	172	245	1607	446	285	988	167
Heavy Vehicles (%)	6%	2%	2%	2%	2%	2%	2%	3%	2%	2%	4%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	14.1	36.3	36.3	17.0	39.2	39.2	13.5	48.6	48.6	10.0	45.1	45.1
Effective Green, g (s)	15.1	38.3	38.3	18.0	41.2	41.2	14.5	50.6	50.6	11.0	47.1	47.1
Actuated g/C Ratio	0.11	0.29	0.29	0.13	0.31	0.31	0.11	0.38	0.38	0.08	0.35	0.35
Clearance Time (s)	4.0	7.8	7.8	4.0	7.8	7.8	4.0	6.6	6.6	4.0	6.6	6.6
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	3.2	3.2	3.0	3.2	3.2
Lane Grp Cap (vph)	375	1289	456	465	1386	491	374	1686	603	284	1554	561
v/s Ratio Prot	0.09	0.22		c0.14	c0.26		c0.07	c0.36		c0.08	0.22	
v/s Ratio Perm			0.09			0.11			0.28			0.10
v/c Ratio	0.81	0.76	0.33	1.04	0.84	0.35	0.66	0.95	0.74	1.00	0.64	0.30
Uniform Delay, d1	58.2	43.7	37.9	58.2	43.4	36.2	57.5	40.7	36.2	61.7	36.4	31.6
Progression 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
Incremental Delay, d2	12.1	2.7	0.6	52.1	4.7	0.6	4.1	12.6	4.9	54.3	0.9	0.3
Delay (s)	70.2	46.5	38.4	110.3	48.2	36.7	61.6	53.3	41.1	115.9	37.3	31.9
Level of Service	E	D	D	F	D	D	E	D	D	F	D	C
Approach Delay (s)		49.7			62.0			51.1			50.1	
Approach LOS		D			E			D			D	

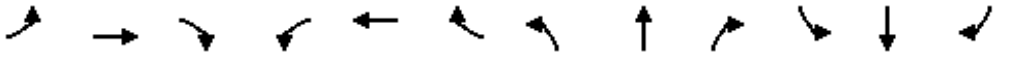
Intersection Summary			
HCM 2000 Control Delay	53.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	134.3	Sum of lost time (s)	16.4
Intersection Capacity Utilization	87.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	286	1602	2012	75	128	93
v/c Ratio	0.91	0.51	0.82	0.08	0.51	0.22
Control Delay	60.6	6.6	19.7	2.2	37.2	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.6	6.6	19.7	2.2	37.2	1.9
Queue Length 50th (m)	27.5	39.3	98.6	0.0	17.9	0.0
Queue Length 95th (m)	#78.7	63.0	141.6	4.8	33.8	1.8
Internal Link Dist (m)		1174.8	1361.6			
Turn Bay Length (m)	130.0			85.0	85.0	85.0
Base Capacity (vph)	315	3144	2444	907	687	856
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	0.91	0.51	0.82	0.08	0.19	0.11

Intersection Summary

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



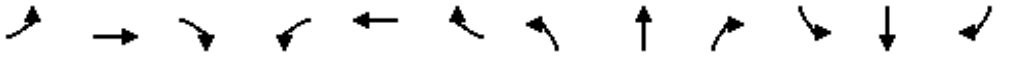
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	286	1602	0	0	2012	75	0	0	0	128	0	93
Future Volume (vph)	286	1602	0	0	2012	75	0	0	0	128	0	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5			4.5	4.5				5.2		5.2
Lane Util. Factor	1.00	*0.80			*0.80	1.00				1.00		1.00
Frt	1.00	1.00			1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1789	4476			4520	1601				1789		1601
Flt Permitted	0.08	1.00			1.00	1.00				0.76		1.00
Satd. Flow (perm)	157	4476			4520	1601				1426		1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	286	1602	0	0	2012	75	0	0	0	128	0	93
RTOR Reduction (vph)	0	0	0	0	0	34	0	0	0	0	0	77
Lane Group Flow (vph)	286	1602	0	0	2012	41	0	0	0	128	0	16
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm				Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	57.1	54.6			41.6	41.6				14.2		14.2
Effective Green, g (s)	58.1	56.6			43.6	43.6				14.2		14.2
Actuated g/C Ratio	0.72	0.70			0.54	0.54				0.18		0.18
Clearance Time (s)	4.0	6.5			6.5	6.5				5.2		5.2
Vehicle Extension (s)	3.0	5.0			5.0	5.0				5.0		5.0
Lane Grp Cap (vph)	316	3147			2448	867				251		282
v/s Ratio Prot	c0.11	0.36			0.45							
v/s Ratio Perm	c0.54					0.03				c0.09		0.01
v/c Ratio	0.91	0.51			0.82	0.05				0.51		0.06
Uniform Delay, d1	24.4	5.5			15.2	8.7				30.0		27.6
Progression Factor	1.00	1.00			1.00	1.00				1.00		1.00
Incremental Delay, d2	27.7	0.3			2.6	0.0				3.4		0.2
Delay (s)	52.0	5.8			17.9	8.7				33.4		27.8
Level of Service	D	A			B	A				C		C
Approach Delay (s)		12.8			17.6			0.0			31.0	
Approach LOS		B			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	80.5	Sum of lost time (s)	10.7
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	332	1232	280	2074	110	62	112	284	230	107
v/c Ratio	0.96	0.41	0.24	0.94	0.64	0.18	0.29	0.90	0.64	0.27
Control Delay	80.1	11.0	1.6	42.3	59.7	47.3	5.2	80.1	59.1	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.1	11.0	1.6	42.3	59.7	47.3	5.2	80.1	59.1	4.4
Queue Length 50th (m)	72.2	56.6	0.0	211.5	23.6	14.2	0.0	67.8	57.6	0.0
Queue Length 95th (m)	#146.0	82.6	10.2	#289.5	39.2	26.7	9.0	#98.7	84.3	7.6
Internal Link Dist (m)		1361.6		653.2		218.8			343.3	
Turn Bay Length (m)	85.0		85.0		85.0		85.0	85.0		85.0
Base Capacity (vph)	347	2990	1171	2217	171	540	537	314	554	548
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.41	0.24	0.94	0.64	0.11	0.21	0.90	0.42	0.20

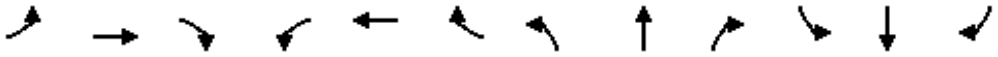
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	332	1232	280	0	2074	0	110	62	112	284	230	107
Future Volume (vph)	332	1232	280	0	2074	0	110	62	112	284	230	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9		4.9		4.5	3.2	5.2	4.5	3.2	5.2
Lane Util. Factor	1.00	*0.80	1.00		*0.80		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	4433	1601		4520		1789	1883	1601	1789	1883	1601
Flt Permitted	0.06	1.00	1.00		1.00		0.30	1.00	1.00	0.66	1.00	1.00
Satd. Flow (perm)	109	4433	1601		4520		557	1883	1601	1250	1883	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	332	1232	280	0	2074	0	110	62	112	284	230	107
RTOR Reduction (vph)	0	0	91	0	0	0	0	0	93	0	0	88
Lane Group Flow (vph)	332	1232	189	0	2074	0	110	62	19	284	230	19
Heavy Vehicles (%)	2%	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	89.9	89.9	89.9		64.9		28.7	23.0	23.0	30.7	24.0	24.0
Effective Green, g (s)	90.9	91.9	91.9		66.9		28.7	25.0	23.0	30.7	26.0	24.0
Actuated g/C Ratio	0.67	0.67	0.67		0.49		0.21	0.18	0.17	0.23	0.19	0.18
Clearance Time (s)	4.0	6.9	6.9		6.9		4.5	5.2	5.2	4.5	5.2	5.2
Vehicle Extension (s)	3.0	5.0	5.0		5.0		3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	344	2991	1080		2220		168	345	270	308	359	282
v/s Ratio Prot	c0.16	0.28			0.46		0.03	0.03		c0.05	0.12	
v/s Ratio Perm	c0.49		0.12				0.11		0.01	c0.16		0.01
v/c Ratio	0.97	0.41	0.17		0.93		0.65	0.18	0.07	0.92	0.64	0.07
Uniform Delay, d1	46.8	10.0	8.2		32.6		47.8	46.9	47.6	51.1	50.8	46.8
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	38.9	0.2	0.2		8.4		8.8	0.5	0.2	31.7	5.3	0.2
Delay (s)	85.7	10.2	8.3		40.9		56.7	47.5	47.8	82.8	56.1	47.0
Level of Service	F	B	A		D		E	D	D	F	E	D
Approach Delay (s)		23.5			40.9			51.2			66.7	
Approach LOS		C			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	38.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	136.2	Sum of lost time (s)	15.6
Intersection Capacity Utilization	96.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

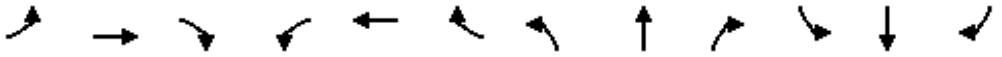


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	323	1003	302	408	1634	210	462	1533	91	257	1603	486
v/c Ratio	1.03	0.77	0.48	0.84	1.06	0.32	1.05	0.91	0.14	0.91	1.09	0.75
Control Delay	119.4	49.8	14.2	74.8	83.7	10.1	113.6	51.0	2.4	98.3	95.0	32.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	119.4	49.8	14.2	74.8	83.7	10.1	113.6	51.0	2.4	98.3	95.0	32.7
Queue Length 50th (m)	~49.0	106.2	17.1	57.3	~206.0	8.8	~71.4	167.1	0.0	37.0	~207.1	74.9
Queue Length 95th (m)	#79.5	125.7	44.2	#79.9	#239.5	27.6	#105.5	191.6	5.8	#62.3	#240.6	118.7
Internal Link Dist (m)		653.2			686.5			2451.0			163.2	
Turn Bay Length (m)	130.0		85.0	85.0		95.0	85.0		85.0	230.0		85.0
Base Capacity (vph)	314	1311	624	495	1546	655	441	1682	671	282	1475	652
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	1.03	0.77	0.48	0.82	1.06	0.32	1.05	0.91	0.14	0.91	1.09	0.75

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.



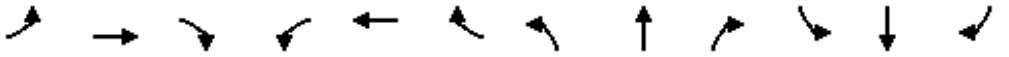
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	323	1003	302	408	1634	210	462	1533	91	257	1603	486
Future Volume (vph)	323	1003	302	408	1634	210	462	1533	91	257	1603	486
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.4	5.4	3.0	5.4	5.4
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3471	4476	1601	3471	4520	1601	3471	4520	1601	3471	4520	1601
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3471	4476	1601	3471	4520	1601	3471	4520	1601	3471	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	323	1003	302	408	1634	210	462	1533	91	257	1603	486
RTOR Reduction (vph)	0	0	156	0	0	107	0	0	57	0	0	130
Lane Group Flow (vph)	323	1003	146	408	1634	103	462	1533	34	257	1603	356
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	11.7	39.0	39.0	18.6	45.9	45.9	16.8	50.1	50.1	10.4	43.7	43.7
Effective Green, g (s)	12.7	41.0	41.0	19.6	47.9	47.9	17.8	52.1	52.1	11.4	45.7	45.7
Actuated g/C Ratio	0.09	0.29	0.29	0.14	0.34	0.34	0.13	0.37	0.37	0.08	0.33	0.33
Clearance Time (s)	4.0	6.5	6.5	4.0	6.5	6.5	4.0	7.4	7.4	4.0	7.4	7.4
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	5.0	5.0
Lane Grp Cap (vph)	314	1310	468	485	1546	547	441	1682	595	282	1475	522
v/s Ratio Prot	c0.09	0.22		c0.12	c0.36		c0.13	0.34		0.07	c0.35	
v/s Ratio Perm			0.09			0.06			0.02			0.22
v/c Ratio	1.03	0.77	0.31	0.84	1.06	0.19	1.05	0.91	0.06	0.91	1.09	0.68
Uniform Delay, d1	63.6	45.1	38.5	58.7	46.0	32.4	61.1	41.8	28.2	63.8	47.1	40.9
Progression 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
Incremental Delay, d2	58.4	3.2	0.8	12.5	39.6	0.3	55.9	7.9	0.0	31.4	50.8	4.7
Delay (s)	122.0	48.3	39.3	71.1	85.6	32.7	117.0	49.6	28.2	95.2	97.9	45.6
Level of Service	F	D	D	E	F	C	F	D	C	F	F	D
Approach Delay (s)		61.3			78.1			63.6			86.8	
Approach LOS		E			E			E			F	

Intersection Summary			
HCM 2000 Control Delay	73.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.9
Intersection Capacity Utilization	99.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	176	1124	50	169	1800	187	32	93	189	255	420
v/c Ratio	0.80	0.54	0.07	0.63	0.85	0.22	0.12	0.15	0.46	0.45	0.77
Control Delay	45.8	19.5	2.4	22.6	28.3	3.4	21.9	18.8	28.0	26.1	28.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.8	19.5	2.4	22.6	28.3	3.4	21.9	18.8	28.0	26.1	28.2
Queue Length 50th (m)	16.0	59.2	0.0	13.1	119.2	0.0	3.9	10.1	26.1	34.7	44.7
Queue Length 95th (m)	#56.7	83.7	4.1	#31.1	#175.5	12.0	10.3	20.2	44.6	55.0	78.6
Internal Link Dist (m)		686.5			658.0			300.4		386.3	
Turn Bay Length (m)	125.0		85.0	135.0		85.0	122.0				85.0
Base Capacity (vph)	219	2071	743	269	2112	847	365	796	549	750	687
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.54	0.07	0.63	0.85	0.22	0.09	0.12	0.34	0.34	0.61

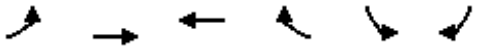
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	176	1124	50	169	1800	187	32	79	14	189	255	420
Future Volume (vph)	176	1124	50	169	1800	187	32	79	14	189	255	420
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.5	3.5		4.5	3.5	5.5
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1659	4350	1484	1789	4520	1601	1789	1841		1789	1746	1484
Flt Permitted	0.09	1.00	1.00	0.15	1.00	1.00	0.46	1.00		0.70	1.00	1.00
Satd. Flow (perm)	164	4350	1484	279	4520	1601	873	1841		1312	1746	1484
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	176	1124	50	169	1800	187	32	79	14	189	255	420
RTOR Reduction (vph)	0	0	26	0	0	100	0	7	0	0	0	96
Lane Group Flow (vph)	176	1124	24	169	1800	87	32	86	0	189	255	324
Heavy Vehicles (%)	10%	6%	10%	2%	2%	2%	2%	2%	2%	2%	10%	10%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	48.3	41.6	41.6	46.7	40.8	40.8	28.0	28.0		28.0	28.0	28.0
Effective Green, g (s)	50.3	43.6	43.6	48.7	42.8	42.8	29.0	30.0		29.0	30.0	28.0
Actuated g/C Ratio	0.55	0.48	0.48	0.53	0.47	0.47	0.32	0.33		0.32	0.33	0.31
Clearance Time (s)	4.0	6.5	6.5	4.0	6.5	6.5	5.5	5.5		5.5	5.5	5.5
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	5.0	5.0		5.0	5.0	5.0
Lane Grp Cap (vph)	215	2072	707	262	2114	748	276	603		415	572	454
v/s Ratio Prot	c0.07	0.26		0.05	c0.40			0.05			0.15	
v/s Ratio Perm	0.38		0.02	0.29		0.05	0.04			0.14		c0.22
v/c Ratio	0.82	0.54	0.03	0.65	0.85	0.12	0.12	0.14		0.46	0.45	0.71
Uniform Delay, d1	19.3	16.9	12.7	12.3	21.5	13.7	22.2	21.7		24.9	24.2	28.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	20.9	0.4	0.0	5.4	3.7	0.1	0.4	0.2		1.7	1.2	6.5
Delay (s)	40.2	17.3	12.8	17.7	25.2	13.8	22.6	21.9		26.6	25.4	34.6
Level of Service	D	B	B	B	C	B	C	C		C	C	C
Approach Delay (s)		20.1			23.6			22.1			30.1	
Approach LOS		C			C			C			C	

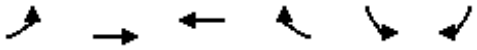
Intersection Summary			
HCM 2000 Control Delay	23.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	91.5	Sum of lost time (s)	11.0
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	131	1197	1822	415	438	334
v/c Ratio	0.48	0.44	0.87	0.46	0.41	0.53
Control Delay	12.7	8.7	22.8	3.5	17.8	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.7	8.7	22.8	3.5	17.8	11.1
Queue Length 50th (m)	6.3	25.3	66.5	0.0	19.6	11.8
Queue Length 95th (m)	12.9	33.5	#97.2	14.2	30.5	31.8
Internal Link Dist (m)		658.0	685.0		264.0	
Turn Bay Length (m)	125.0			85.0		
Base Capacity (vph)	273	2934	2089	896	1080	631
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	0.48	0.41	0.87	0.46	0.41	0.53

Intersection Summary

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



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	131	1197	1822	415	438	334
Future Volume (vph)	131	1197	1822	415	438	334
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1789	5142	5142	1601	3471	1601
Flt Permitted	0.14	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	268	5142	5142	1601	3471	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	131	1197	1822	415	438	334
RTOR Reduction (vph)	0	0	0	249	0	134
Lane Group Flow (vph)	131	1197	1822	166	438	200
Turn Type	pm+pt	NA	NA	Perm	Perm	Perm
Protected Phases	7	4	8			
Permitted Phases	4			8	6	6
Actuated Green, G (s)	32.0	32.0	23.6	23.6	18.1	18.1
Effective Green, g (s)	32.0	32.0	23.6	23.6	18.1	18.1
Actuated g/C Ratio	0.54	0.54	0.40	0.40	0.31	0.31
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	245	2784	2053	639	1063	490
v/s Ratio Prot	0.04	c0.23	c0.35			
v/s Ratio Perm	0.25			0.10	c0.13	0.12
v/c Ratio	0.53	0.43	0.89	0.26	0.41	0.41
Uniform Delay, d1	10.9	8.1	16.5	11.9	16.3	16.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2	0.1	5.1	0.2	1.2	2.5
Delay (s)	13.2	8.2	21.6	12.1	17.5	18.8
Level of Service	B	A	C	B	B	B
Approach Delay (s)		8.7	19.8		18.0	
Approach LOS		A	B		B	

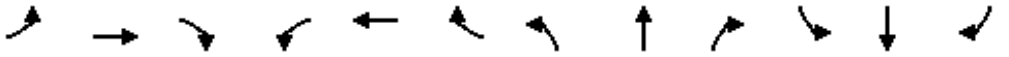
Intersection Summary			
HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	59.1	Sum of lost time (s)	13.5
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	17	1450	168	15	2029	490	106	213	296	356	102
v/c Ratio	0.10	0.68	0.20	0.08	0.88	0.50	0.76	0.24	0.87	0.70	0.21
Control Delay	14.4	25.1	3.8	14.2	32.6	8.1	86.5	32.6	76.8	45.4	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.4	25.1	3.8	14.2	32.6	8.1	86.5	32.6	76.8	45.4	7.4
Queue Length 50th (m)	1.6	87.0	0.1	1.4	144.5	14.8	22.0	17.6	31.8	66.6	0.0
Queue Length 95th (m)	5.7	153.2	12.8	5.2	#263.7	54.4	#61.8	30.3	#69.7	108.5	12.7
Internal Link Dist (m)		685.0			1030.1			436.1		413.0	
Turn Bay Length (m)	85.0		85.0	85.0		85.0	85.0		85.0		85.0
Base Capacity (vph)	177	2127	856	186	2294	983	139	1233	341	693	627
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.68	0.20	0.08	0.88	0.50	0.76	0.17	0.87	0.51	0.16

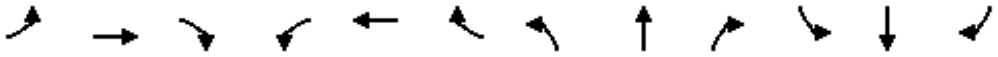
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	1450	168	15	2029	490	106	189	24	296	356	102
Future Volume (vph)	17	1450	168	15	2029	490	106	189	24	296	356	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.5	3.2		4.5	3.2	5.2
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	0.95		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1659	4192	1526	1690	4520	1601	1772	3518		3471	1883	1601
Flt Permitted	0.07	1.00	1.00	0.08	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	124	4192	1526	138	4520	1601	1772	3518		3471	1883	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	17	1450	168	15	2029	490	106	189	24	296	356	102
RTOR Reduction (vph)	0	0	84	0	0	175	0	8	0	0	0	77
Lane Group Flow (vph)	17	1450	84	15	2029	315	106	205	0	296	356	25
Heavy Vehicles (%)	10%	10%	7%	8%	2%	2%	3%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6						4
Actuated Green, G (s)	58.0	55.5	55.5	58.0	55.5	55.5	8.9	26.4		11.1	28.6	28.6
Effective Green, g (s)	60.0	57.5	57.5	60.0	57.5	57.5	8.9	28.4		11.1	30.6	28.6
Actuated g/C Ratio	0.52	0.50	0.50	0.52	0.50	0.50	0.08	0.25		0.10	0.26	0.25
Clearance Time (s)	4.0	6.5	6.5	4.0	6.5	6.5	4.5	5.2		4.5	5.2	5.2
Vehicle Extension (s)	2.5	5.0	5.0	2.5	5.0	5.0	3.0	5.0		3.0	5.0	5.0
Lane Grp Cap (vph)	110	2083	758	118	2246	795	136	863		333	498	395
v/s Ratio Prot	c0.00	0.35		0.00	c0.45		0.06	0.06		c0.09	c0.19	
v/s Ratio Perm	0.08		0.06	0.06		0.20						0.02
v/c Ratio	0.15	0.70	0.11	0.13	0.90	0.40	0.78	0.24		0.89	0.71	0.06
Uniform Delay, d1	23.3	22.4	15.5	16.4	26.6	18.2	52.4	35.0		51.7	38.6	33.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	1.3	0.1	0.4	5.9	0.7	24.0	0.3		23.7	6.0	0.1
Delay (s)	23.8	23.7	15.6	16.7	32.5	18.9	76.5	35.3		75.4	44.6	33.5
Level of Service	C	C	B	B	C	B	E	D		E	D	C
Approach Delay (s)		22.9			29.8			49.0			55.2	
Approach LOS		C			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	32.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	115.7	Sum of lost time (s)	15.2
Intersection Capacity Utilization	74.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

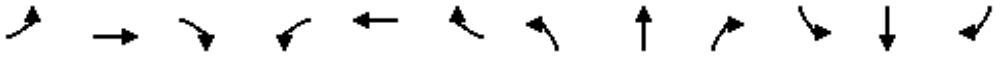


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	67	1181	571	411	1909	717	524	1752	280	278	1507	157
v/c Ratio	0.44	0.87	0.87	0.96	1.07	0.82	1.04	1.03	0.40	0.97	1.06	0.27
Control Delay	76.5	55.7	42.4	95.9	83.1	35.0	110.5	73.7	15.5	110.8	88.0	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.5	55.7	42.4	95.9	83.1	35.0	110.5	73.7	15.5	110.8	88.0	7.1
Queue Length 50th (m)	9.8	133.9	97.7	61.3	~258.6	155.1	~83.7	~223.7	24.0	41.7	~197.3	1.4
Queue Length 95th (m)	18.0	155.7	#164.5	#93.1	#291.1	217.1	#119.6	#256.9	47.8	#70.7	#231.1	17.4
Internal Link Dist (m)		309.3			173.0			421.7			476.7	
Turn Bay Length (m)	50.0		70.0	90.0		70.0	165.0		70.0	140.0		70.0
Base Capacity (vph)	154	1362	655	430	1791	875	502	1701	705	287	1424	592
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	0.44	0.87	0.87	0.96	1.07	0.82	1.04	1.03	0.40	0.97	1.06	0.27

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.



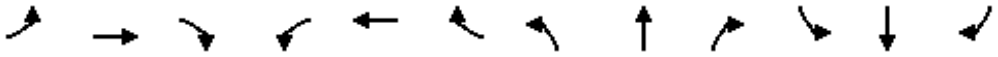
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	1181	571	411	1909	717	524	1752	280	278	1507	157
Future Volume (vph)	67	1181	571	411	1909	717	524	1752	280	278	1507	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	2.0	3.0	4.9	4.9	3.0	4.9	4.9
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3437	4476	1601	3471	4520	1601	3471	4476	1601	3471	4476	1541
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3437	4476	1601	3471	4520	1601	3471	4476	1601	3471	4476	1541
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	67	1181	571	411	1909	717	524	1752	280	278	1507	157
RTOR Reduction (vph)	0	0	168	0	0	47	0	0	98	0	0	103
Lane Group Flow (vph)	67	1181	403	411	1909	670	524	1752	182	278	1507	54
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%	2%	3%	2%	2%	3%	6%
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	4.4	42.8	42.8	17.0	55.4	66.4	20.0	53.1	53.1	11.0	44.1	44.1
Effective Green, g (s)	5.4	44.8	44.8	18.0	57.4	70.4	21.0	55.1	55.1	12.0	46.1	46.1
Actuated g/C Ratio	0.04	0.31	0.31	0.12	0.39	0.48	0.14	0.38	0.38	0.08	0.32	0.32
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	4.0	4.0	6.9	6.9	4.0	6.9	6.9
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	127	1376	492	428	1780	773	500	1692	605	285	1416	487
v/s Ratio Prot	0.02	0.26		c0.12	c0.42	0.08	c0.15	c0.39		0.08	0.34	
v/s Ratio Perm			0.25			0.34			0.11			0.04
v/c Ratio	0.53	0.86	0.82	0.96	1.07	0.87	1.05	1.04	0.30	0.98	1.06	0.11
Uniform Delay, d1	68.9	47.5	46.7	63.5	44.1	33.5	62.3	45.3	31.8	66.7	49.8	35.3
Progression 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
Incremental Delay, d2	3.9	5.7	10.8	33.3	43.8	10.1	53.4	31.6	1.3	46.1	43.1	0.5
Delay (s)	72.8	53.2	57.5	96.8	87.9	43.6	115.7	76.9	33.1	112.8	92.9	35.8
Level of Service	E	D	E	F	F	D	F	E	C	F	F	D
Approach Delay (s)		55.3			78.6			80.1			91.1	
Approach LOS		E			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	77.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	145.7	Sum of lost time (s)	15.8
Intersection Capacity Utilization	100.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Queues

11: James Snow Parkway S & Louis St. Laurent Avenue

10-23-2024

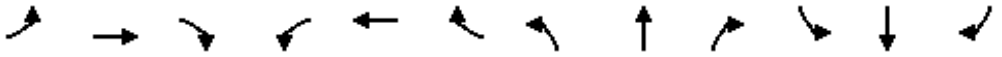


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	216	920	216	333	1334	133	337	1527	202	229	1798	229
v/c Ratio	0.51	0.74	0.34	0.71	1.04	0.20	1.64	0.98	0.31	1.12	1.15	0.36
Control Delay	60.6	43.2	15.6	65.1	78.3	6.6	348.4	62.1	12.3	154.0	116.6	15.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.6	43.2	15.6	65.1	78.3	6.6	348.4	62.1	12.3	154.0	116.6	15.5
Queue Length 50th (m)	27.3	113.5	17.6	42.6	~202.3	1.7	~63.8	158.9	10.3	~34.0	~222.2	16.3
Queue Length 95th (m)	43.0	140.2	38.0	63.9	#245.3	15.2	#105.0	#232.1	32.0	#68.2	#298.9	42.2
Internal Link Dist (m)		214.6			322.8			302.9			114.0	
Turn Bay Length (m)	85.0		140.0	85.0		85.0	115.0		85.0	85.0		85.0
Base Capacity (vph)	756	1439	716	537	1283	652	205	1560	645	205	1560	641
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	0.29	0.64	0.30	0.62	1.04	0.20	1.64	0.98	0.31	1.12	1.15	0.36

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.



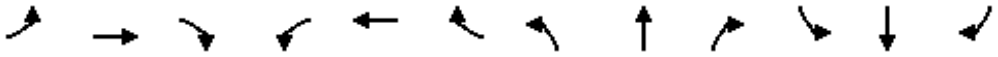
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	216	920	216	333	1334	133	337	1527	202	229	1798	229
Future Volume (vph)	216	920	216	333	1334	133	337	1527	202	229	1798	229
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.8	3.8	3.0	3.8	3.8	3.0	5.4	5.4	3.0	5.4	5.4
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3404	3579	1601	3471	3579	1601	3471	4520	1601	3471	4520	1601
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3404	3579	1601	3471	3579	1601	3471	4520	1601	3471	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	216	920	216	333	1334	133	337	1527	202	229	1798	229
RTOR Reduction (vph)	0	0	79	0	0	79	0	0	93	0	0	89
Lane Group Flow (vph)	216	920	137	333	1334	54	337	1527	109	229	1798	140
Heavy Vehicles (%)	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	15.8	45.0	45.0	17.3	46.5	46.5	7.0	44.7	44.7	7.0	44.7	44.7
Effective Green, g (s)	16.8	47.0	47.0	18.3	48.5	48.5	8.0	46.7	46.7	8.0	46.7	46.7
Actuated g/C Ratio	0.12	0.35	0.35	0.14	0.36	0.36	0.06	0.35	0.35	0.06	0.35	0.35
Clearance Time (s)	4.0	5.8	5.8	4.0	5.8	5.8	4.0	7.4	7.4	4.0	7.4	7.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	422	1244	556	469	1283	574	205	1561	553	205	1561	553
v/s Ratio Prot	0.06	0.26		c0.10	c0.37		c0.10	0.34		0.07	c0.40	
v/s Ratio Perm			0.09			0.03			0.07			0.09
v/c Ratio	0.51	0.74	0.25	0.71	1.04	0.09	1.64	0.98	0.20	1.12	1.15	0.25
Uniform Delay, d1	55.4	38.7	31.5	55.9	43.3	28.8	63.6	43.7	31.1	63.6	44.2	31.7
Progression 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
Incremental Delay, d2	1.1	2.3	0.2	5.0	36.1	0.1	310.7	17.8	0.4	97.8	76.2	0.5
Delay (s)	56.4	41.1	31.7	60.9	79.4	28.8	374.3	61.6	31.4	161.4	120.4	32.2
Level of Service	E	D	C	E	E	C	F	E	C	F	F	C
Approach Delay (s)		42.0			72.3			109.6			115.6	
Approach LOS		D			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	90.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	135.2	Sum of lost time (s)	15.2
Intersection Capacity Utilization	108.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	137	13	314	96	213	219	1770	244	67	1786	461
v/c Ratio	0.80	0.04	0.75	0.35	0.50	0.79	0.71	0.25	0.31	0.81	0.46
Control Delay	61.5	24.2	29.1	30.0	15.7	37.8	16.8	2.5	9.9	21.7	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.5	24.2	29.1	30.0	15.7	37.8	16.8	2.5	9.9	21.7	3.5
Queue Length 50th (m)	19.6	1.6	26.0	12.4	10.8	15.5	79.1	0.0	2.7	87.5	1.4
Queue Length 95th (m)	38.5	5.7	52.1	24.7	28.4	#60.6	126.9	11.5	8.8	#140.9	18.1
Internal Link Dist (m)		483.8			361.2		451.9			2451.0	
Turn Bay Length (m)	85.0		85.0	85.0		85.0		85.0	85.0		85.0
Base Capacity (vph)	411	887	822	665	843	276	2499	994	214	2218	1010
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.01	0.38	0.14	0.25	0.79	0.71	0.25	0.31	0.81	0.46

Intersection Summary

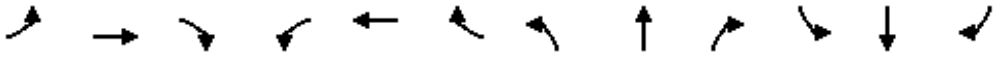
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	137	13	314	96	34	179	219	1770	244	67	1786	461
Future Volume (vph)	137	13	314	96	34	179	219	1770	244	67	1786	461
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6		4.5	7.6	7.6	4.5	7.6	7.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	1883	1601	1789	1646		1789	4520	1601	1789	4520	1601
Flt Permitted	0.46	1.00	1.00	0.75	1.00		0.09	1.00	1.00	0.10	1.00	1.00
Satd. Flow (perm)	872	1883	1601	1411	1646		173	4520	1601	190	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	137	13	314	96	34	179	219	1770	244	67	1786	461
RTOR Reduction (vph)	0	0	102	0	103	0	0	0	111	0	0	222
Lane Group Flow (vph)	137	13	212	96	110	0	219	1770	133	67	1786	239
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	15.5	15.5	15.5	15.5	15.5		51.4	43.6	43.6	43.6	39.7	39.7
Effective Green, g (s)	15.5	15.5	15.5	15.5	15.5		51.4	43.6	43.6	43.6	39.7	39.7
Actuated g/C Ratio	0.19	0.19	0.19	0.19	0.19		0.64	0.55	0.55	0.55	0.50	0.50
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6		4.5	7.6	7.6	4.5	7.6	7.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	169	366	311	274	320		269	2472	875	182	2251	797
v/s Ratio Prot		0.01			0.07		c0.08	0.39		0.02	0.40	
v/s Ratio Perm	c0.16		0.13	0.07			c0.44		0.08	0.18		0.15
v/c Ratio	0.81	0.04	0.68	0.35	0.34		0.81	0.72	0.15	0.37	0.79	0.30
Uniform Delay, d1	30.7	26.0	29.8	27.7	27.7		17.3	13.4	8.9	10.0	16.6	11.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	24.6	0.0	6.0	0.8	0.6		17.0	1.8	0.4	1.3	3.0	1.0
Delay (s)	55.3	26.1	35.8	28.5	28.4		34.3	15.3	9.3	11.3	19.6	12.8
Level of Service	E	C	D	C	C		C	B	A	B	B	B
Approach Delay (s)		41.3			28.4			16.5			18.0	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	79.7	Sum of lost time (s)	16.7
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

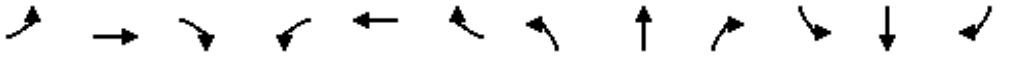


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	140	1308	464	414	2205	643	361	1287	380	338	1608	116
v/c Ratio	0.79	0.84	0.69	0.87	1.14	0.80	1.26	0.94	0.59	1.01	1.12	0.19
Control Delay	96.7	50.0	30.3	79.8	107.2	32.7	192.7	62.6	20.5	115.3	109.9	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	96.7	50.0	30.3	79.8	107.2	32.7	192.7	62.6	20.5	115.3	109.9	5.3
Queue Length 50th (m)	20.8	144.3	71.8	60.8	~306.5	114.4	~66.7	150.2	36.6	~51.4	~221.2	0.0
Queue Length 95th (m)	#38.1	166.5	112.9	#87.0	#337.8	169.6	#98.6	#183.0	70.5	#83.6	#254.7	11.8
Internal Link Dist (m)		888.5			759.7			657.0			690.8	
Turn Bay Length (m)	130.0		110.0	300.0		70.0	110.0		70.0	130.0		85.0
Base Capacity (vph)	177	1549	671	478	1938	803	287	1370	647	335	1432	598
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	0.79	0.84	0.69	0.87	1.14	0.80	1.26	0.94	0.59	1.01	1.12	0.19

Intersection Summary

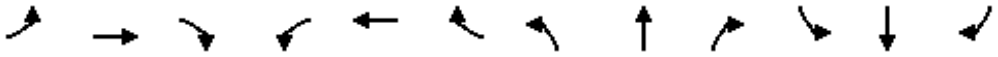
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	1308	464	414	2205	643	361	1287	380	338	1608	116
Future Volume (vph)	140	1308	464	414	2205	643	361	1287	380	338	1608	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	4.6	4.6	3.0	4.6	4.6
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3219	4476	1601	3471	4520	1601	3471	4476	1601	3471	4476	1601
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3219	4476	1601	3471	4520	1601	3471	4476	1601	3471	4476	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	140	1308	464	414	2205	643	361	1287	380	338	1608	116
RTOR Reduction (vph)	0	0	118	0	0	117	0	0	157	0	0	79
Lane Group Flow (vph)	140	1308	346	414	2205	526	361	1287	223	338	1608	37
Heavy Vehicles (%)	10%	3%	2%	2%	2%	2%	2%	3%	2%	2%	3%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	7.0	48.2	48.2	19.0	60.2	60.2	11.0	42.4	42.4	13.0	44.4	44.4
Effective Green, g (s)	8.0	50.2	50.2	20.0	62.2	62.2	12.0	44.4	44.4	14.0	46.4	46.4
Actuated g/C Ratio	0.06	0.35	0.35	0.14	0.43	0.43	0.08	0.31	0.31	0.10	0.32	0.32
Clearance Time (s)	4.0	7.8	7.8	4.0	7.8	7.8	4.0	6.6	6.6	4.0	6.6	6.6
Vehicle Extension (s)	5.0	3.0	3.0	5.0	3.0	3.0	4.0	5.0	5.0	4.0	5.0	5.0
Lane Grp Cap (vph)	177	1549	554	478	1938	686	287	1370	490	335	1432	512
v/s Ratio Prot	0.04	0.29		c0.12	c0.49		c0.10	0.29		0.10	c0.36	
v/s Ratio Perm			0.22			0.33			0.14			0.02
v/c Ratio	0.79	0.84	0.63	0.87	1.14	0.77	1.26	0.94	0.46	1.01	1.12	0.07
Uniform Delay, d1	67.7	43.8	39.5	61.2	41.4	35.2	66.5	49.0	40.6	65.5	49.3	34.3
Progression 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
Incremental Delay, d2	23.7	4.4	2.2	16.3	68.9	5.1	141.2	12.9	1.4	51.4	65.1	0.1
Delay (s)	91.3	48.2	41.8	77.5	110.3	40.4	207.7	61.9	42.0	116.9	114.4	34.4
Level of Service	F	D	D	E	F	D	F	E	D	F	F	C
Approach Delay (s)		49.8			92.4			84.1			110.3	
Approach LOS		D			F			F			F	

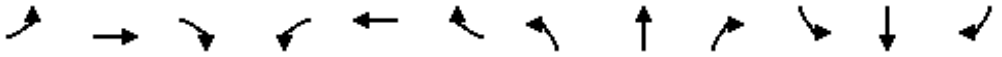
Intersection Summary			
HCM 2000 Control Delay	85.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	105.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	86	61	14	296	168	379	160	2484	310	196	1875	85
v/c Ratio	0.38	0.16	0.06	0.95	0.35	0.81	0.65	0.92	0.24	0.88	0.71	0.09
Control Delay	39.2	45.6	0.4	81.3	44.9	45.4	31.9	27.1	1.0	63.9	18.9	0.8
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	39.2	45.6	0.4	81.3	44.9	45.4	31.9	27.1	1.0	63.9	18.9	0.8
Queue Length 50th (m)	14.7	6.3	0.0	57.3	17.4	63.3	16.4	194.1	0.0	26.2	120.5	0.0
Queue Length 95th (m)	27.8	12.7	0.0	#112.5	27.7	#110.1	37.7	#233.0	6.8	#69.0	143.7	2.5
Internal Link Dist (m)		1074.9			770.5			396.6			272.1	
Turn Bay Length (m)	85.0		85.0	120.0		85.0	170.0		70.0	170.0		70.0
Base Capacity (vph)	228	392	249	310	507	468	278	2700	1268	222	2635	986
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	0.38	0.16	0.06	0.95	0.33	0.81	0.58	0.92	0.24	0.88	0.71	0.09

Intersection Summary

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

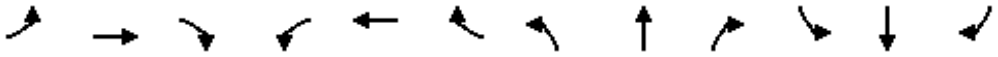


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	61	14	296	168	379	160	2484	310	196	1875	85
Future Volume (vph)	86	61	14	296	168	379	160	2484	310	196	1875	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.4	7.4	3.0	5.4	4.0	3.0	3.6	2.0	3.0	3.6	3.6
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	3510	1601	1789	3579	1601	1789	4520	1601	1789	4520	1601
Flt Permitted	0.65	1.00	1.00	0.53	1.00	1.00	0.06	1.00	1.00	0.06	1.00	1.00
Satd. Flow (perm)	1216	3510	1601	1005	3579	1601	119	4520	1601	122	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	86	61	14	296	168	379	160	2484	310	196	1875	85
RTOR Reduction (vph)	0	0	13	0	0	56	0	0	93	0	0	36
Lane Group Flow (vph)	86	61	1	296	168	323	160	2484	217	196	1875	49
Heavy Vehicles (%)	2%	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	Perm
Protected Phases	7	8		3	4	1	5	2	3	1	6	
Permitted Phases	8		8	4		4	2		2	6		6
Actuated Green, G (s)	11.9	7.8	7.8	21.8	13.2	21.2	71.8	62.2	72.2	68.6	60.6	60.6
Effective Green, g (s)	13.9	9.8	7.8	22.8	15.2	21.2	73.8	64.2	76.2	70.6	62.6	62.6
Actuated g/C Ratio	0.13	0.09	0.07	0.21	0.14	0.19	0.68	0.59	0.70	0.65	0.57	0.57
Clearance Time (s)	4.5	7.4	7.4	4.0	7.4	4.0	4.0	5.6	4.0	4.0	5.6	5.6
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	3.0	3.0	5.0	5.0
Lane Grp Cap (vph)	181	315	114	289	499	311	242	2662	1119	216	2595	919
v/s Ratio Prot	0.02	0.02		c0.10	0.05	c0.08	c0.06	c0.55	0.02	0.07	0.41	
v/s Ratio Perm	0.04		0.00	c0.11		0.13	0.38		0.11	0.51		0.03
v/c Ratio	0.48	0.19	0.01	1.02	0.34	1.04	0.66	0.93	0.19	0.91	0.72	0.05
Uniform Delay, d1	43.6	45.9	47.0	42.0	42.3	43.9	24.0	20.4	5.7	33.4	16.9	10.2
Progression 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
Incremental Delay, d2	2.0	0.6	0.1	59.3	0.8	61.1	6.6	7.5	0.1	36.5	1.8	0.1
Delay (s)	45.5	46.6	47.1	101.3	43.2	105.0	30.6	28.0	5.8	69.9	18.7	10.3
Level of Service	D	D	D	F	D	F	C	C	A	E	B	B
Approach Delay (s)		46.1			91.4			25.8			23.0	
Approach LOS		D			F			C			C	

Intersection Summary			
HCM 2000 Control Delay	34.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	109.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	98.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Queues
1: Regional Road 25 & Britannia Road

10-23-2024



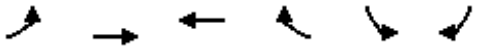
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	264	1094	178	355	898	71	298	904	408	273	1196	148
v/c Ratio	0.67	0.83	0.30	0.84	0.66	0.13	0.74	0.61	0.57	0.69	0.81	0.25
Control Delay	64.5	50.0	6.3	73.9	43.3	3.8	68.6	38.1	15.0	65.9	44.7	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.5	50.0	6.3	73.9	43.3	3.8	68.6	38.1	15.0	65.9	44.7	5.8
Queue Length 50th (m)	35.0	114.0	0.0	48.4	88.4	0.0	40.1	82.7	27.9	36.4	119.4	0.0
Queue Length 95th (m)	49.4	134.6	16.8	#72.3	106.4	6.8	55.8	99.5	60.7	51.2	140.3	14.4
Internal Link Dist (m)		239.5			177.4			308.0			325.9	
Turn Bay Length (m)	142.0		89.0	147.0		118.0	120.0		132.0	120.0		115.0
Base Capacity (vph)	436	1363	607	436	1377	553	419	1567	733	427	1567	625
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	0.61	0.80	0.29	0.81	0.65	0.13	0.71	0.58	0.56	0.64	0.76	0.24

Intersection Summary

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

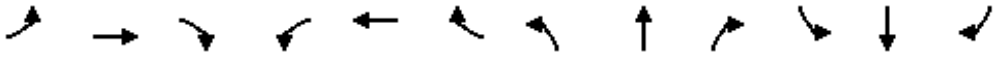
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	264	1094	178	355	898	71	298	904	408	273	1196	148
Future Volume (vph)	264	1094	178	355	898	71	298	904	408	273	1196	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	4.6	4.6	3.0	4.6	4.6
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3340	4520	1601	3340	4520	1601	3404	4391	1570	3471	4391	1484
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3340	4520	1601	3340	4520	1601	3404	4391	1570	3471	4391	1484
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	264	1094	178	355	898	71	298	904	408	273	1196	148
RTOR Reduction (vph)	0	0	126	0	0	50	0	0	178	0	0	98
Lane Group Flow (vph)	264	1094	52	355	898	21	298	904	230	273	1196	50
Heavy Vehicles (%)	6%	2%	2%	6%	2%	2%	4%	5%	4%	2%	5%	10%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	14.5	36.1	36.1	15.6	37.2	37.2	14.4	42.3	42.3	14.0	41.9	41.9
Effective Green, g (s)	15.5	38.1	38.1	16.6	39.2	39.2	15.4	44.3	44.3	15.0	43.9	43.9
Actuated g/C Ratio	0.12	0.29	0.29	0.13	0.30	0.30	0.12	0.34	0.34	0.12	0.34	0.34
Clearance Time (s)	4.0	7.8	7.8	4.0	7.8	7.8	4.0	6.6	6.6	4.0	6.6	6.6
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	3.2	3.2	3.0	3.2	3.2
Lane Grp Cap (vph)	397	1320	467	425	1358	481	402	1491	533	399	1478	499
v/s Ratio Prot	0.08	c0.24		c0.11	0.20		c0.09	0.21		0.08	c0.27	
v/s Ratio Perm			0.03			0.01			0.15			0.03
v/c Ratio	0.66	0.83	0.11	0.84	0.66	0.04	0.74	0.61	0.43	0.68	0.81	0.10
Uniform Delay, d1	55.0	43.1	33.8	55.6	39.8	32.3	55.6	35.8	33.3	55.4	39.4	29.7
Progression 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
Incremental Delay, d2	4.2	4.7	0.1	13.3	1.3	0.1	7.2	0.7	0.6	4.8	3.4	0.1
Delay (s)	59.1	47.8	33.9	68.8	41.1	32.4	62.8	36.5	33.9	60.2	42.8	29.8
Level of Service	E	D	C	E	D	C	E	D	C	E	D	C
Approach Delay (s)		48.1			48.1			40.7			44.6	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	45.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	130.4	Sum of lost time (s)	16.4
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



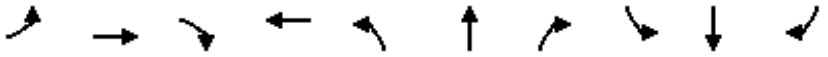
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	159	1643	1213	132	54	170
v/c Ratio	0.41	0.52	0.53	0.15	0.25	0.45
Control Delay	13.1	5.6	11.3	2.3	27.7	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.1	5.6	11.3	2.3	27.7	9.7
Queue Length 50th (m)	4.4	30.7	36.1	0.0	6.0	1.0
Queue Length 95th (m)	10.3	47.3	52.6	6.8	14.9	15.3
Internal Link Dist (m)		1174.8	1361.6			
Turn Bay Length (m)	130.0			85.0	85.0	85.0
Base Capacity (vph)	389	3138	2448	901	860	1038
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	0.41	0.52	0.50	0.15	0.06	0.16

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	159	1643	0	0	1213	132	0	0	0	54	0	170
Future Volume (vph)	159	1643	0	0	1213	132	0	0	0	54	0	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5			4.5	4.5				5.2		5.2
Lane Util. Factor	1.00	*0.80			*0.80	1.00				1.00		1.00
Frt	1.00	1.00			1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1789	4520			4391	1512				1772		1601
Flt Permitted	0.15	1.00			1.00	1.00				0.76		1.00
Satd. Flow (perm)	279	4520			4391	1512				1412		1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	159	1643	0	0	1213	132	0	0	0	54	0	170
RTOR Reduction (vph)	0	0	0	0	0	63	0	0	0	0	0	136
Lane Group Flow (vph)	159	1643	0	0	1213	69	0	0	0	54	0	34
Heavy Vehicles (%)	2%	2%	2%	2%	5%	8%	2%	2%	10%	3%	10%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm				Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	45.0	42.5			31.4	31.4				9.8		9.8
Effective Green, g (s)	46.0	44.5			33.4	33.4				9.8		9.8
Actuated g/C Ratio	0.72	0.70			0.52	0.52				0.15		0.15
Clearance Time (s)	4.0	6.5			6.5	6.5				5.2		5.2
Vehicle Extension (s)	3.0	5.0			5.0	5.0				5.0		5.0
Lane Grp Cap (vph)	391	3142			2291	789				216		245
v/s Ratio Prot	0.05	c0.36			0.28							
v/s Ratio Perm	0.24					0.05				c0.04		0.02
v/c Ratio	0.41	0.52			0.53	0.09				0.25		0.14
Uniform Delay, d1	9.3	4.7			10.1	7.7				23.9		23.4
Progression Factor	1.00	1.00			1.00	1.00				1.00		1.00
Incremental Delay, d2	0.7	0.3			0.4	0.1				1.3		0.5
Delay (s)	10.0	5.0			10.5	7.8				25.1		24.0
Level of Service	B	A			B	A				C		C
Approach Delay (s)		5.4			10.3			0.0			24.3	
Approach LOS		A			B			A			C	

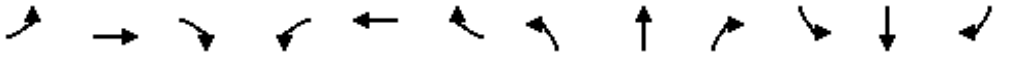
Intersection Summary			
HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	64.0	Sum of lost time (s)	10.7
Intersection Capacity Utilization	52.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	42	1806	12	923	204	54	204	331	119	238
v/c Ratio	0.13	0.66	0.01	0.39	0.61	0.19	0.59	0.85	0.38	0.60
Control Delay	8.7	14.5	0.0	14.4	36.4	37.6	18.6	52.1	40.3	15.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.7	14.5	0.0	14.4	36.4	37.6	18.6	52.1	40.3	15.4
Queue Length 50th (m)	2.7	84.2	0.0	42.6	30.8	9.1	8.3	54.3	20.5	6.3
Queue Length 95th (m)	7.6	118.9	0.0	61.1	49.8	19.7	29.2	#88.4	36.7	28.3
Internal Link Dist (m)		1361.6		653.2		218.8			343.3	
Turn Bay Length (m)	85.0		85.0		85.0		85.0	85.0		85.0
Base Capacity (vph)	330	2758	1020	2761	338	748	700	390	769	732
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.65	0.01	0.33	0.60	0.07	0.29	0.85	0.15	0.33

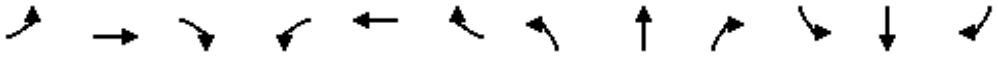
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	1806	12	0	923	0	204	54	204	331	119	238
Future Volume (vph)	42	1806	12	0	923	0	204	54	204	331	119	238
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9		4.9		4.5	3.2	5.2	4.5	3.2	5.2
Lane Util. Factor	1.00	*0.80	1.00		*0.80		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1738	4520	1601		4309		1789	1883	1601	1789	1883	1570
Flt Permitted	0.21	1.00	1.00		1.00		0.60	1.00	1.00	0.67	1.00	1.00
Satd. Flow (perm)	387	4520	1601		4309		1123	1883	1601	1254	1883	1570
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	42	1806	12	0	923	0	204	54	204	331	119	238
RTOR Reduction (vph)	0	0	5	0	0	0	0	0	136	0	0	172
Lane Group Flow (vph)	42	1806	7	0	923	0	204	54	68	331	119	66
Heavy Vehicles (%)	5%	2%	2%	2%	7%	5%	2%	2%	2%	2%	2%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	59.2	59.2	59.2		52.0		23.0	13.1	13.1	25.2	14.2	14.2
Effective Green, g (s)	60.2	61.2	61.2		54.0		23.0	15.1	13.1	25.2	16.2	14.2
Actuated g/C Ratio	0.60	0.61	0.61		0.54		0.23	0.15	0.13	0.25	0.16	0.14
Clearance Time (s)	4.0	6.9	6.9		6.9		4.5	5.2	5.2	4.5	5.2	5.2
Vehicle Extension (s)	3.0	5.0	5.0		5.0		3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	290	2769	980		2329		324	284	209	375	305	223
v/s Ratio Prot	0.01	c0.40			0.21		0.06	0.03		c0.10	0.06	
v/s Ratio Perm	0.08		0.00				0.08		0.04	c0.13		0.04
v/c Ratio	0.14	0.65	0.01		0.40		0.63	0.19	0.33	0.88	0.39	0.29
Uniform Delay, d1	8.7	12.5	7.5		13.4		33.4	37.1	39.4	35.0	37.4	38.4
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.8	0.0		0.2		3.8	0.7	1.9	20.9	1.7	1.5
Delay (s)	8.9	13.2	7.5		13.7		37.2	37.7	41.3	55.9	39.2	39.9
Level of Service	A	B	A		B		D	D	D	E	D	D
Approach Delay (s)		13.1			13.7			39.1			47.5	
Approach LOS		B			B			D			D	

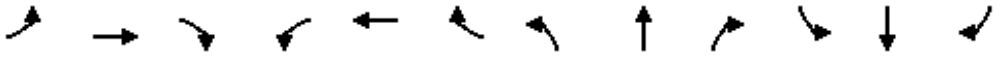
Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	99.9	Sum of lost time (s)	15.6
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	357	1507	479	187	738	159	339	1398	236	286	993	153
v/c Ratio	0.78	0.87	0.60	0.83	0.55	0.26	0.67	0.90	0.37	0.88	0.75	0.27
Control Delay	70.6	46.1	16.5	93.2	42.5	3.9	64.1	52.6	15.9	89.6	48.9	6.5
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	70.6	46.1	16.5	93.2	42.5	3.9	64.1	52.6	15.9	89.6	48.9	6.5
Queue Length 50th (m)	49.4	160.0	41.2	26.9	72.3	0.0	46.8	152.0	19.4	41.0	102.8	0.0
Queue Length 95th (m)	66.7	183.7	77.7	#47.2	88.4	10.7	63.4	175.3	41.6	#65.9	121.8	15.7
Internal Link Dist (m)		653.2			686.5			2451.0			163.2	
Turn Bay Length (m)	130.0		85.0	85.0		95.0	85.0		85.0	230.0		85.0
Base Capacity (vph)	485	1738	792	224	1331	608	503	1579	646	324	1368	577
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	0.74	0.87	0.60	0.83	0.55	0.26	0.67	0.89	0.37	0.88	0.73	0.27

Intersection Summary

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



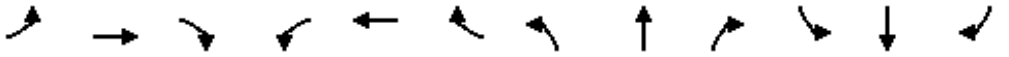
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	357	1507	479	187	738	159	339	1398	236	286	993	153
Future Volume (vph)	357	1507	479	187	738	159	339	1398	236	286	993	153
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.4	5.4	3.0	5.4	5.4
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3248	4520	1601	3471	4309	1555	3471	4520	1601	3471	4520	1555
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3248	4520	1601	3471	4309	1555	3471	4520	1601	3471	4520	1555
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	357	1507	479	187	738	159	339	1398	236	286	993	153
RTOR Reduction (vph)	0	0	177	0	0	110	0	0	89	0	0	108
Lane Group Flow (vph)	357	1507	302	187	738	49	339	1398	147	286	993	45
Heavy Vehicles (%)	9%	2%	2%	2%	7%	5%	2%	2%	2%	2%	2%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	18.5	51.5	51.5	8.0	41.0	41.0	19.2	45.7	45.7	12.0	38.5	38.5
Effective Green, g (s)	19.5	53.5	53.5	9.0	43.0	43.0	20.2	47.7	47.7	13.0	40.5	40.5
Actuated g/C Ratio	0.14	0.38	0.38	0.06	0.31	0.31	0.15	0.34	0.34	0.09	0.29	0.29
Clearance Time (s)	4.0	6.5	6.5	4.0	6.5	6.5	4.0	7.4	7.4	4.0	7.4	7.4
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	5.0	5.0
Lane Grp Cap (vph)	455	1738	615	224	1332	480	504	1549	549	324	1316	452
v/s Ratio Prot	c0.11	c0.33		c0.05	0.17		0.10	c0.31		c0.08	0.22	
v/s Ratio Perm			0.19			0.03			0.09			0.03
v/c Ratio	0.78	0.87	0.49	0.83	0.55	0.10	0.67	0.90	0.27	0.88	0.75	0.10
Uniform Delay, d1	57.8	39.5	32.5	64.3	40.1	34.3	56.3	43.5	33.1	62.3	44.8	36.0
Progression 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
Incremental Delay, d2	8.6	5.3	1.3	22.7	0.9	0.2	3.5	7.7	0.3	23.4	3.0	0.2
Delay (s)	66.4	44.8	33.8	87.0	40.9	34.5	59.8	51.2	33.3	85.7	47.8	36.2
Level of Service	E	D	C	F	D	C	E	D	C	F	D	D
Approach Delay (s)		45.8			47.9			50.5			54.1	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	49.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	139.1	Sum of lost time (s)	15.9
Intersection Capacity Utilization	84.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	336	1682	11	1	811	102	57	409	15	81	214
v/c Ratio	0.73	0.66	0.01	0.00	0.51	0.16	0.14	0.71	0.11	0.14	0.34
Control Delay	23.1	16.6	0.0	10.0	24.5	5.1	23.9	32.3	25.4	22.9	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.1	16.6	0.0	10.0	24.5	5.1	23.9	32.3	25.4	22.9	5.1
Queue Length 50th (m)	26.7	74.5	0.0	0.1	45.4	0.0	7.1	57.7	1.9	9.9	0.0
Queue Length 95th (m)	#73.6	140.5	0.0	0.8	68.2	10.0	17.5	101.1	7.1	22.3	15.6
Internal Link Dist (m)		686.5			658.0			300.4		386.3	
Turn Bay Length (m)	125.0		85.0	135.0		85.0	122.0				85.0
Base Capacity (vph)	488	2767	995	214	2087	822	575	780	197	815	800
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.61	0.01	0.00	0.39	0.12	0.10	0.52	0.08	0.10	0.27

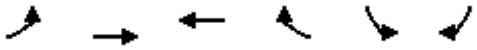
Intersection Summary

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



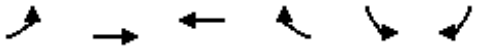
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	336	1682	11	1	811	102	57	253	156	15	81	214
Future Volume (vph)	336	1682	11	1	811	102	57	253	156	15	81	214
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.5	3.5		4.5	3.5	5.5
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1674	4520	1585	1789	4350	1601	1789	1713		1789	1830	1601
Flt Permitted	0.21	1.00	1.00	0.11	1.00	1.00	0.70	1.00		0.24	1.00	1.00
Satd. Flow (perm)	365	4520	1585	215	4350	1601	1327	1713		454	1830	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	336	1682	11	1	811	102	57	253	156	15	81	214
RTOR Reduction (vph)	0	0	5	0	0	62	0	21	0	0	0	151
Lane Group Flow (vph)	336	1682	6	1	811	40	57	388	0	15	81	63
Heavy Vehicles (%)	9%	2%	3%	2%	6%	2%	2%	8%	2%	2%	5%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	53.5	48.6	48.6	35.0	34.1	34.1	27.2	27.2		27.2	27.2	27.2
Effective Green, g (s)	54.5	50.6	50.6	37.0	36.1	36.1	28.2	29.2		28.2	29.2	27.2
Actuated g/C Ratio	0.59	0.55	0.55	0.40	0.39	0.39	0.30	0.31		0.30	0.31	0.29
Clearance Time (s)	4.0	6.5	6.5	4.0	6.5	6.5	5.5	5.5		5.5	5.5	5.5
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	5.0	5.0		5.0	5.0	5.0
Lane Grp Cap (vph)	446	2467	865	118	1694	623	403	539		138	576	469
v/s Ratio Prot	c0.13	0.37		0.00	0.19			c0.23			0.04	
v/s Ratio Perm	c0.31		0.00	0.00		0.02	0.04			0.03		0.04
v/c Ratio	0.75	0.68	0.01	0.01	0.48	0.06	0.14	0.72		0.11	0.14	0.13
Uniform Delay, d1	11.9	15.2	9.6	17.1	21.2	17.7	23.4	28.1		23.2	22.8	24.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.1	0.9	0.0	0.0	0.3	0.1	0.3	5.7		0.7	0.2	0.3
Delay (s)	18.9	16.1	9.6	17.1	21.5	17.8	23.8	33.8		23.9	23.0	24.4
Level of Service	B	B	A	B	C	B	C	C		C	C	C
Approach Delay (s)		16.5			21.1			32.6			24.0	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	92.7	Sum of lost time (s)	11.0
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	318	1535	849	403	309	67
v/c Ratio	0.66	0.52	0.46	0.48	0.35	0.15
Control Delay	13.9	10.0	18.3	4.2	22.5	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.9	10.0	18.3	4.2	22.5	6.9
Queue Length 50th (m)	17.6	40.6	30.6	0.0	16.9	0.0
Queue Length 95th (m)	30.7	51.3	40.9	16.0	26.8	8.3
Internal Link Dist (m)		658.0	685.0		264.0	
Turn Bay Length (m)	125.0			85.0		
Base Capacity (vph)	488	2947	1842	831	895	462
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	0.52	0.46	0.48	0.35	0.15

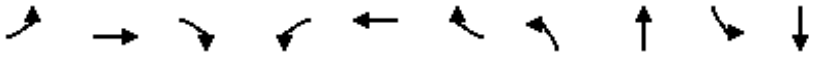
Intersection Summary



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	318	1535	849	403	309	67
Future Volume (vph)	318	1535	849	403	309	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.5	6.5	6.5	5.5	5.5
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1789	5142	5142	1601	3471	1601
Flt Permitted	0.24	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	461	5142	5142	1601	3471	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	318	1535	849	403	309	67
RTOR Reduction (vph)	0	0	0	259	0	50
Lane Group Flow (vph)	318	1535	849	144	309	17
Turn Type	pm+pt	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases	2			6	4	4
Actuated Green, G (s)	39.8	39.8	25.0	25.0	18.0	18.0
Effective Green, g (s)	39.8	39.8	25.0	25.0	18.0	18.0
Actuated g/C Ratio	0.57	0.57	0.36	0.36	0.26	0.26
Clearance Time (s)	4.0	6.5	6.5	6.5	5.5	5.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	468	2931	1841	573	895	412
v/s Ratio Prot	c0.11	0.30	0.17			
v/s Ratio Perm	c0.28			0.09	c0.09	0.01
v/c Ratio	0.68	0.52	0.46	0.25	0.35	0.04
Uniform Delay, d1	8.6	9.2	17.2	15.8	21.1	19.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.9	0.2	0.2	0.2	1.1	0.2
Delay (s)	12.5	9.4	17.4	16.0	22.2	19.6
Level of Service	B	A	B	B	C	B
Approach Delay (s)		9.9	17.0		21.7	
Approach LOS		A	B		C	

Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	69.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	60.6%	ICU Level of Service	B
Analysis Period (min)	15		

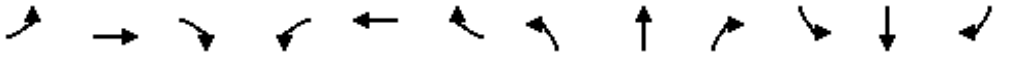
c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	115	1626	102	59	1023	424	228	326	304	137
v/c Ratio	0.41	0.75	0.14	0.31	0.53	0.45	0.78	0.46	0.66	0.48
Control Delay	16.4	27.6	6.0	16.2	23.7	3.6	63.7	41.2	53.4	48.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.4	27.6	6.0	16.2	23.7	3.6	63.7	41.2	53.4	48.8
Queue Length 50th (m)	11.1	123.6	1.9	5.5	66.5	0.0	48.5	33.1	33.6	28.2
Queue Length 95th (m)	21.7	158.3	12.0	12.7	88.3	17.7	#89.0	48.4	48.6	47.3
Internal Link Dist (m)		685.0			1030.1			436.1		413.0
Turn Bay Length (m)	85.0		85.0	85.0		85.0	85.0		85.0	
Base Capacity (vph)	287	2170	757	192	2034	979	318	1344	583	648
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.75	0.13	0.31	0.50	0.43	0.72	0.24	0.52	0.21

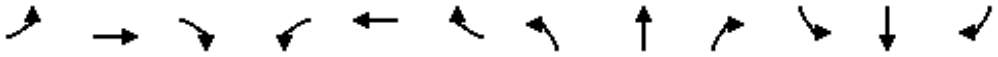
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	1626	102	59	1023	424	228	307	19	304	137	0
Future Volume (vph)	115	1626	102	59	1023	424	228	307	19	304	137	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.5	3.2		4.5	3.2	
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	0.95		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1789	4520	1484	1706	4309	1601	1690	3547		3471	1812	
Flt Permitted	0.16	1.00	1.00	0.08	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	296	4520	1484	146	4309	1601	1690	3547		3471	1812	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	115	1626	102	59	1023	424	228	307	19	304	137	0
RTOR Reduction (vph)	0	0	45	0	0	232	0	4	0	0	0	0
Lane Group Flow (vph)	115	1626	57	59	1023	192	228	322	0	304	137	0
Heavy Vehicles (%)	2%	2%	10%	7%	7%	2%	8%	2%	2%	2%	6%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6						4
Actuated Green, G (s)	58.3	50.6	50.6	53.7	48.3	48.3	19.1	20.0		14.6	15.5	
Effective Green, g (s)	60.3	52.6	52.6	55.7	50.3	50.3	19.1	22.0		14.6	17.5	
Actuated g/C Ratio	0.54	0.47	0.47	0.50	0.45	0.45	0.17	0.20		0.13	0.16	
Clearance Time (s)	4.0	6.5	6.5	4.0	6.5	6.5	4.5	5.2		4.5	5.2	
Vehicle Extension (s)	2.5	5.0	5.0	2.5	5.0	5.0	3.0	5.0		3.0	5.0	
Lane Grp Cap (vph)	278	2145	704	163	1956	726	291	704		457	286	
v/s Ratio Prot	c0.03	c0.36		0.02	0.24		c0.13	c0.09		0.09	0.08	
v/s Ratio Perm	0.19		0.04	0.16		0.12						
v/c Ratio	0.41	0.76	0.08	0.36	0.52	0.27	0.78	0.46		0.67	0.48	
Uniform Delay, d1	14.0	23.9	15.9	18.6	21.7	18.8	43.9	39.1		45.8	42.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	1.9	0.1	1.0	0.5	0.4	12.9	1.0		3.6	2.6	
Delay (s)	14.7	25.8	16.0	19.6	22.1	19.2	56.8	40.1		49.4	45.1	
Level of Service	B	C	B	B	C	B	E	D		D	D	
Approach Delay (s)		24.5			21.2			47.0			48.1	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	110.8	Sum of lost time (s)	15.2
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

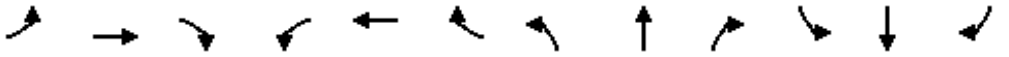


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	117	1411	418	216	990	217	440	1472	430	531	1594	102
v/c Ratio	0.53	1.00	0.63	0.94	0.73	0.36	1.03	0.97	0.66	1.02	0.98	0.17
Control Delay	69.9	70.5	18.2	106.7	45.6	7.0	106.8	60.3	30.2	100.9	59.6	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.9	70.5	18.2	106.7	45.6	7.0	106.8	60.3	30.2	100.9	59.6	6.7
Queue Length 50th (m)	15.8	~157.1	33.2	30.0	98.6	1.9	~64.2	160.3	66.4	~77.3	173.6	1.0
Queue Length 95th (m)	25.9	#196.5	69.3	#54.5	117.5	20.2	#97.3	#198.0	103.7	#112.4	#213.3	12.8
Internal Link Dist (m)		309.3			173.0			421.7			476.7	
Turn Bay Length (m)	50.0		70.0	90.0		70.0	165.0		70.0	140.0		70.0
Base Capacity (vph)	226	1409	664	231	1348	606	429	1517	649	519	1629	611
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	0.52	1.00	0.63	0.94	0.73	0.36	1.03	0.97	0.66	1.02	0.98	0.17

Intersection Summary

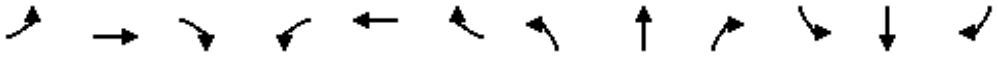
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	117	1411	418	216	990	217	440	1472	430	531	1594	102
Future Volume (vph)	117	1411	418	216	990	217	440	1472	430	531	1594	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3219	4520	1541	3471	4350	1498	3219	4350	1601	3340	4391	1484
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3219	4520	1541	3471	4350	1498	3219	4350	1601	3340	4391	1484
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	117	1411	418	216	990	217	440	1472	430	531	1594	102
RTOR Reduction (vph)	0	0	184	0	0	143	0	0	91	0	0	60
Lane Group Flow (vph)	117	1411	234	216	990	74	440	1472	339	531	1594	42
Heavy Vehicles (%)	10%	2%	6%	2%	6%	9%	10%	6%	2%	6%	5%	10%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	8.3	40.1	40.1	8.0	39.8	39.8	17.0	45.1	45.1	20.0	48.1	48.1
Effective Green, g (s)	9.3	42.1	42.1	9.0	41.8	41.8	18.0	47.1	47.1	21.0	50.1	50.1
Actuated g/C Ratio	0.07	0.31	0.31	0.07	0.31	0.31	0.13	0.35	0.35	0.16	0.37	0.37
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	221	1409	480	231	1346	463	429	1517	558	519	1629	550
v/s Ratio Prot	0.04	c0.31		c0.06	0.23		0.14	0.34		c0.16	c0.36	
v/s Ratio Perm			0.15			0.05			0.21			0.03
v/c Ratio	0.53	1.00	0.49	0.94	0.74	0.16	1.03	0.97	0.61	1.02	0.98	0.08
Uniform Delay, d1	60.7	46.5	37.7	62.7	41.7	33.8	58.5	43.3	36.3	57.0	41.9	27.5
Progression 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
Incremental Delay, d2	2.3	24.3	1.1	41.3	2.3	0.2	50.2	16.7	2.8	45.5	17.4	0.1
Delay (s)	63.0	70.8	38.7	104.0	43.9	34.1	108.7	60.0	39.1	102.5	59.3	27.6
Level of Service	E	E	D	F	D	C	F	E	D	F	E	C
Approach Delay (s)		63.4			51.5			65.3			68.2	
Approach LOS		E			D			E			E	

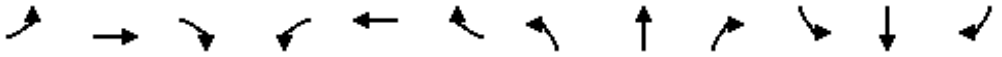
Intersection Summary			
HCM 2000 Control Delay	63.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	15.8
Intersection Capacity Utilization	91.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	335	984	331	227	594	131	176	1542	194	142	873	197
v/c Ratio	0.67	0.82	0.51	0.63	0.57	0.23	0.58	0.86	0.27	0.79	0.56	0.29
Control Delay	62.4	47.6	20.4	67.9	43.3	4.2	69.0	44.6	9.8	94.5	38.1	5.5
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	62.4	47.6	20.4	67.9	43.3	4.2	69.0	44.6	9.8	94.5	38.1	5.5
Queue Length 50th (m)	45.4	128.7	35.8	30.8	71.0	0.0	24.1	161.5	8.4	20.1	80.6	0.0
Queue Length 95th (m)	62.0	154.3	64.0	46.5	94.5	10.4	38.2	#200.3	26.5	#40.6	104.1	17.1
Internal Link Dist (m)		214.6			322.8			302.9			114.0	
Turn Bay Length (m)	85.0		140.0	85.0		85.0	115.0		85.0	85.0		85.0
Base Capacity (vph)	760	1411	729	396	1103	599	308	1792	722	179	1570	683
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	0.44	0.70	0.45	0.57	0.54	0.22	0.57	0.86	0.27	0.79	0.56	0.29

Intersection Summary

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



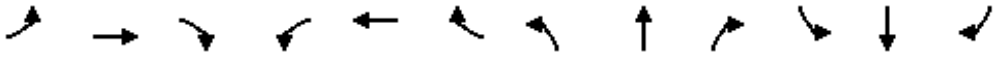
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	335	984	331	227	594	131	176	1542	194	142	873	197
Future Volume (vph)	335	984	331	227	594	131	176	1542	194	142	873	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.8	3.8	3.0	3.8	3.8	3.0	5.4	5.4	3.0	5.4	5.4
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3437	3579	1601	3471	3579	1601	3219	4520	1601	3471	4433	1570
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3437	3579	1601	3471	3579	1601	3219	4520	1601	3471	4433	1570
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	335	984	331	227	594	131	176	1542	194	142	873	197
RTOR Reduction (vph)	0	0	107	0	0	93	0	0	87	0	0	127
Lane Group Flow (vph)	335	984	224	227	594	38	176	1542	107	142	873	70
Heavy Vehicles (%)	3%	2%	2%	2%	2%	2%	10%	2%	2%	2%	4%	4%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	19.0	43.8	43.8	13.1	37.9	37.9	11.8	52.0	52.0	6.0	46.2	46.2
Effective Green, g (s)	20.0	45.8	45.8	14.1	39.9	39.9	12.8	54.0	54.0	7.0	48.2	48.2
Actuated g/C Ratio	0.15	0.34	0.34	0.10	0.29	0.29	0.09	0.40	0.40	0.05	0.35	0.35
Clearance Time (s)	4.0	5.8	5.8	4.0	5.8	5.8	4.0	7.4	7.4	4.0	7.4	7.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	505	1204	538	359	1049	469	302	1793	635	178	1569	556
v/s Ratio Prot	c0.10	c0.27		0.07	0.17		c0.05	c0.34		c0.04	0.20	
v/s Ratio Perm			0.14			0.02			0.07			0.04
v/c Ratio	0.66	0.82	0.42	0.63	0.57	0.08	0.58	0.86	0.17	0.80	0.56	0.13
Uniform Delay, d1	54.9	41.3	34.8	58.5	40.8	34.8	59.1	37.6	26.5	63.8	35.4	29.7
Progression 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
Incremental Delay, d2	3.3	4.4	0.5	3.6	0.7	0.1	4.4	4.9	0.3	21.5	0.7	0.2
Delay (s)	58.1	45.7	35.3	62.1	41.5	34.9	63.5	42.5	26.8	85.3	36.1	29.9
Level of Service	E	D	D	E	D	C	E	D	C	F	D	C
Approach Delay (s)		46.2			45.5			42.8			40.9	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	43.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	136.1	Sum of lost time (s)	15.2
Intersection Capacity Utilization	82.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	223	35	564	197	41	28	1714	61	153	1484	22
v/c Ratio	0.49	0.06	0.94	0.43	0.07	0.17	0.85	0.08	0.78	0.65	0.03
Control Delay	32.8	24.3	52.2	31.3	9.5	13.0	32.4	5.3	47.8	22.6	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.8	24.3	52.2	31.3	9.5	13.0	32.4	5.3	47.8	22.6	0.0
Queue Length 50th (m)	36.9	4.9	93.9	31.9	0.7	2.5	137.5	0.1	17.1	105.1	0.0
Queue Length 95th (m)	59.7	11.9	#158.4	52.2	7.9	6.4	162.3	7.6	#51.0	125.2	0.0
Internal Link Dist (m)		483.8			361.2		451.9			2451.0	
Turn Bay Length (m)	85.0		85.0	85.0		85.0		85.0	85.0		85.0
Base Capacity (vph)	495	678	650	498	612	163	2010	745	195	2285	839
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.05	0.87	0.40	0.07	0.17	0.85	0.08	0.78	0.65	0.03

Intersection Summary

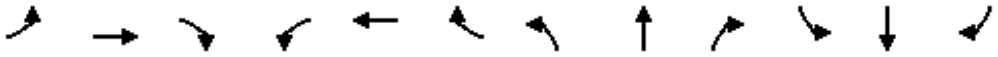
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	223	35	564	197	5	36	28	1714	61	153	1484	22
Future Volume (vph)	223	35	564	197	5	36	28	1714	61	153	1484	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6		4.5	7.6	7.6	4.5	7.6	7.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	1883	1601	1789	1635		1789	4520	1601	1789	4520	1601
Flt Permitted	0.73	1.00	1.00	0.73	1.00		0.09	1.00	1.00	0.07	1.00	1.00
Satd. Flow (perm)	1376	1883	1601	1383	1635		167	4520	1601	140	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	223	35	564	197	5	36	28	1714	61	153	1484	22
RTOR Reduction (vph)	0	0	78	0	24	0	0	0	33	0	0	11
Lane Group Flow (vph)	223	35	486	197	17	0	28	1714	28	153	1484	11
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	35.0	35.0	35.0	35.0	35.0		52.3	49.4	49.4	61.4	54.0	54.0
Effective Green, g (s)	35.0	35.0	35.0	35.0	35.0		52.3	49.4	49.4	61.4	54.0	54.0
Actuated g/C Ratio	0.32	0.32	0.32	0.32	0.32		0.48	0.45	0.45	0.57	0.50	0.50
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6		4.5	7.6	7.6	4.5	7.6	7.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	443	606	515	445	526		123	2056	728	193	2247	796
v/s Ratio Prot		0.02			0.01		0.01	c0.38		c0.05	0.33	
v/s Ratio Perm	0.16		c0.30	0.14			0.10		0.02	0.39		0.01
v/c Ratio	0.50	0.06	0.94	0.44	0.03		0.23	0.83	0.04	0.79	0.66	0.01
Uniform Delay, d1	29.8	25.4	35.8	29.1	25.2		16.2	26.0	16.4	22.7	20.4	13.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	0.0	26.1	0.7	0.0		0.9	4.2	0.1	19.6	1.5	0.0
Delay (s)	30.7	25.5	62.0	29.8	25.2		17.2	30.1	16.5	42.3	22.0	13.9
Level of Service	C	C	E	C	C		B	C	B	D	C	B
Approach Delay (s)		51.9			29.0			29.5			23.7	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	108.6	Sum of lost time (s)	16.7
Intersection Capacity Utilization	88.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	40	1821	313	180	1102	637	395	1507	757	186	878	57
v/c Ratio	0.20	1.05	0.42	0.55	0.58	0.70	1.08	1.02	0.94	0.93	0.70	0.10
Control Delay	63.0	78.0	10.5	64.9	30.9	24.4	124.2	71.5	51.4	109.2	46.3	0.4
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	63.0	78.0	10.5	64.9	30.9	24.4	124.2	71.5	51.4	109.2	46.3	0.4
Queue Length 50th (m)	5.3	~220.6	15.6	23.9	93.9	107.8	~60.2	~176.5	175.4	25.9	87.0	0.0
Queue Length 95th (m)	11.4	#253.8	39.1	36.2	111.2	154.5	#92.4	#210.2	#261.6	#48.8	105.0	0.0
Internal Link Dist (m)		888.5			759.7			657.0			690.8	
Turn Bay Length (m)	130.0		110.0	300.0		70.0	110.0		70.0	130.0		85.0
Base Capacity (vph)	201	1727	749	330	1894	915	367	1482	803	201	1256	548
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	0.20	1.05	0.42	0.55	0.58	0.70	1.08	1.02	0.94	0.93	0.70	0.10

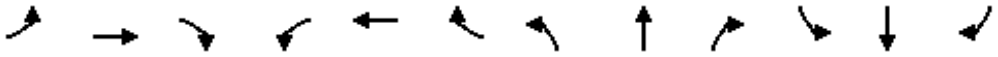
Intersection Summary

~ 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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	1821	313	180	1102	637	395	1507	757	186	878	57
Future Volume (vph)	40	1821	313	180	1102	637	395	1507	757	186	878	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.8	5.8	3.0	5.8	2.0	3.0	4.6	2.0	3.0	4.6	4.6
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3404	4520	1601	3437	4350	1601	3309	4350	1601	3404	4350	1484
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3404	4520	1601	3437	4350	1601	3309	4350	1601	3404	4350	1484
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	40	1821	313	180	1102	637	395	1507	757	186	878	57
RTOR Reduction (vph)	0	0	137	0	0	47	0	0	40	0	0	41
Lane Group Flow (vph)	40	1821	176	180	1102	590	395	1507	717	186	878	16
Heavy Vehicles (%)	4%	2%	2%	3%	6%	2%	7%	6%	2%	4%	6%	10%
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6	7	3	8	1	7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	5.6	50.4	50.4	12.0	56.8	63.8	14.0	44.0	56.0	7.0	37.0	37.0
Effective Green, g (s)	6.6	52.4	52.4	13.0	58.8	67.8	15.0	46.0	60.0	8.0	39.0	39.0
Actuated g/C Ratio	0.05	0.39	0.39	0.10	0.43	0.50	0.11	0.34	0.44	0.06	0.29	0.29
Clearance Time (s)	4.0	7.8	7.8	4.0	7.8	4.0	4.0	6.6	4.0	4.0	6.6	6.6
Vehicle Extension (s)	5.0	3.0	3.0	5.0	3.0	4.0	4.0	5.0	5.0	4.0	5.0	5.0
Lane Grp Cap (vph)	165	1744	617	329	1883	799	365	1473	707	200	1249	426
v/s Ratio Prot	0.01	c0.40		0.05	0.25	0.05	c0.12	c0.35	c0.10	0.05	0.20	
v/s Ratio Perm			0.11			0.32			0.34			0.01
v/c Ratio	0.24	1.04	0.29	0.55	0.59	0.74	1.08	1.02	1.01	0.93	0.70	0.04
Uniform Delay, d1	62.2	41.7	28.8	58.6	29.2	27.0	60.4	44.9	37.9	63.6	43.2	34.9
Progression 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
Incremental Delay, d2	1.6	34.1	0.3	3.3	0.5	3.8	70.9	29.5	37.6	44.6	2.3	0.1
Delay (s)	63.8	75.8	29.0	61.8	29.7	30.8	131.3	74.4	75.5	108.2	45.5	35.0
Level of Service	E	E	C	E	C	C	F	E	E	F	D	C
Approach Delay (s)		68.8			33.1			83.1			55.4	
Approach LOS		E			C			F			E	

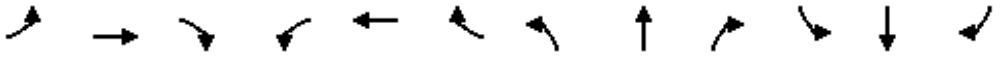
Intersection Summary			
HCM 2000 Control Delay	63.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	135.8	Sum of lost time (s)	16.4
Intersection Capacity Utilization	99.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	106	165	124	318	19	66	1	1588	216	305	2386	111
v/c Ratio	0.31	0.46	0.43	0.87	0.04	0.21	0.01	0.76	0.25	0.90	0.83	0.11
Control Delay	37.0	55.0	7.0	64.5	43.2	1.5	8.0	28.8	4.5	62.0	20.0	0.8
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	37.0	55.0	7.0	64.5	43.2	1.5	8.0	28.8	4.5	62.0	20.0	0.8
Queue Length 50th (m)	19.3	19.6	0.0	65.8	2.0	0.0	0.1	126.3	3.3	54.7	154.7	0.0
Queue Length 95th (m)	34.1	30.8	6.3	#108.7	5.5	0.0	0.6	147.8	16.3	#101.3	228.5	2.9
Internal Link Dist (m)		1074.9			770.5			396.6			272.1	
Turn Bay Length (m)	85.0		85.0	120.0		85.0	170.0		70.0	170.0		70.0
Base Capacity (vph)	337	362	288	365	563	328	156	2097	857	363	2864	1013
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	0.31	0.46	0.43	0.87	0.03	0.20	0.01	0.76	0.25	0.84	0.83	0.11

Intersection Summary

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

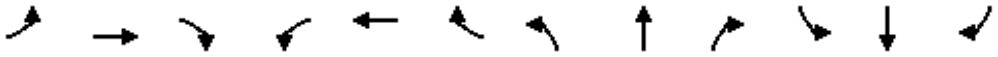


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	165	124	318	19	66	1	1588	216	305	2386	111
Future Volume (vph)	106	165	124	318	19	66	1	1588	216	305	2386	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.4	7.4	3.0	5.4	7.4	3.0	3.6	3.6	3.0	3.6	3.6
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	3579	1526	1789	3544	1484	1755	4433	1601	1722	4433	1484
Flt Permitted	0.74	1.00	1.00	0.56	1.00	1.00	0.07	1.00	1.00	0.07	1.00	1.00
Satd. Flow (perm)	1402	3579	1526	1061	3544	1484	127	4433	1601	118	4433	1484
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	106	165	124	318	19	66	1	1588	216	305	2386	111
RTOR Reduction (vph)	0	0	112	0	0	59	0	0	99	0	0	42
Lane Group Flow (vph)	106	165	12	318	19	7	1	1588	117	305	2386	69
Heavy Vehicles (%)	2%	2%	7%	2%	3%	10%	4%	4%	2%	6%	4%	10%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	8		3	4		5	2		1	6	
Permitted Phases	8		8	4		4	2		2	6		6
Actuated Green, G (s)	24.4	11.6	11.6	28.3	13.3	13.3	58.3	57.2	57.2	79.6	74.5	74.5
Effective Green, g (s)	26.4	13.6	11.6	30.3	15.3	13.3	60.3	59.2	59.2	80.6	76.5	76.5
Actuated g/C Ratio	0.21	0.11	0.09	0.25	0.12	0.11	0.49	0.48	0.48	0.65	0.62	0.62
Clearance Time (s)	4.5	7.4	7.4	4.0	7.4	7.4	4.0	5.6	5.6	4.0	5.6	5.6
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	343	395	143	355	440	160	89	2130	769	329	2752	921
v/s Ratio Prot	0.03	0.05		c0.12	0.01		0.00	0.36		c0.15	0.54	
v/s Ratio Perm	0.03		0.01	c0.10		0.00	0.01		0.07	c0.46		0.05
v/c Ratio	0.31	0.42	0.08	0.90	0.04	0.04	0.01	0.75	0.15	0.93	0.87	0.07
Uniform Delay, d1	40.4	51.1	50.9	43.2	47.5	49.3	21.6	25.9	17.9	38.7	19.2	9.3
Progression 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
Incremental Delay, d2	0.5	1.5	0.5	23.8	0.1	0.2	0.1	2.4	0.4	31.1	4.0	0.2
Delay (s)	40.9	52.6	51.5	67.0	47.6	49.5	21.6	28.3	18.4	69.9	23.2	9.4
Level of Service	D	D	D	E	D	D	C	C	B	E	C	A
Approach Delay (s)		49.1			63.2			27.1			27.7	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	123.2	Sum of lost time (s)	15.5
Intersection Capacity Utilization	90.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Queues
1: Regional Road 25 & Britannia Road

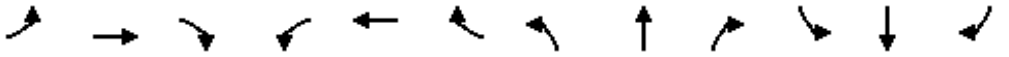
10-23-2024



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	258	829	238	411	986	244	209	1366	520	243	840	290
v/c Ratio	0.65	0.67	0.41	0.83	0.73	0.40	0.61	0.83	0.68	0.76	0.53	0.38
Control Delay	63.8	45.1	10.4	70.3	45.0	11.8	65.1	43.6	19.9	74.5	35.1	4.9
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	63.8	45.1	10.4	70.3	45.0	11.8	65.1	43.6	19.9	74.5	35.1	4.9
Queue Length 50th (m)	34.0	80.3	7.8	55.6	97.2	11.2	27.7	138.3	52.0	33.1	74.5	0.0
Queue Length 95th (m)	48.4	97.4	29.0	#80.1	116.3	33.1	41.0	161.5	94.1	#52.4	90.6	18.9
Internal Link Dist (m)		239.5			177.4			308.0			325.9	
Turn Bay Length (m)	142.0		89.0	147.0		118.0	120.0		132.0	120.0		115.0
Base Capacity (vph)	438	1363	621	509	1433	634	370	1682	782	322	1611	766
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	0.59	0.61	0.38	0.81	0.69	0.38	0.56	0.81	0.66	0.75	0.52	0.38

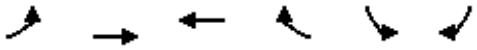
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	258	829	238	411	986	244	209	1366	520	243	840	290
Future Volume (vph)	258	829	238	411	986	244	209	1366	520	243	840	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	4.6	4.6	3.0	4.6	4.6
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3340	4520	1601	3471	4520	1601	3471	4476	1601	3471	4433	1601
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3340	4520	1601	3471	4520	1601	3471	4476	1601	3471	4433	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	258	829	238	411	986	244	209	1366	520	243	840	290
RTOR Reduction (vph)	0	0	144	0	0	131	0	0	184	0	0	186
Lane Group Flow (vph)	258	829	94	411	986	113	209	1366	336	243	840	104
Heavy Vehicles (%)	6%	2%	2%	2%	2%	2%	2%	3%	2%	2%	4%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	14.3	33.4	33.4	17.5	36.6	36.6	11.8	45.5	45.5	11.0	44.7	44.7
Effective Green, g (s)	15.3	35.4	35.4	18.5	38.6	38.6	12.8	47.5	47.5	12.0	46.7	46.7
Actuated g/C Ratio	0.12	0.27	0.27	0.14	0.30	0.30	0.10	0.37	0.37	0.09	0.36	0.36
Clearance Time (s)	4.0	7.8	7.8	4.0	7.8	7.8	4.0	6.6	6.6	4.0	6.6	6.6
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	3.2	3.2	3.0	3.2	3.2
Lane Grp Cap (vph)	393	1232	436	494	1344	476	342	1637	585	320	1594	576
v/s Ratio Prot	0.08	0.18		c0.12	c0.22		0.06	c0.31		c0.07	0.19	
v/s Ratio Perm			0.06			0.07			0.21			0.07
v/c Ratio	0.66	0.67	0.22	0.83	0.73	0.24	0.61	0.83	0.57	0.76	0.53	0.18
Uniform Delay, d1	54.7	42.0	36.5	54.1	41.0	34.5	56.1	37.6	33.0	57.5	32.8	28.5
Progression 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
Incremental Delay, d2	3.9	1.6	0.3	11.4	2.3	0.4	3.2	3.9	1.4	9.9	0.3	0.2
Delay (s)	58.7	43.6	36.8	65.6	43.2	34.8	59.3	41.4	34.5	67.4	33.2	28.6
Level of Service	E	D	D	E	D	C	E	D	C	E	C	C
Approach Delay (s)		45.3			47.6			41.5			38.3	
Approach LOS		D			D			D			D	

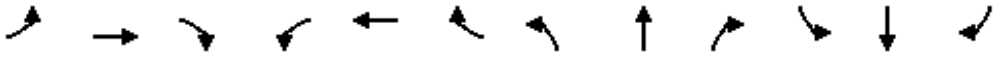
Intersection Summary			
HCM 2000 Control Delay	43.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	129.8	Sum of lost time (s)	16.4
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	244	1362	1711	64	109	80
v/c Ratio	0.76	0.43	0.69	0.07	0.46	0.20
Control Delay	40.8	5.5	15.4	1.5	36.4	1.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	5.5	15.4	1.5	36.4	1.1
Queue Length 50th (m)	19.7	28.9	72.3	0.0	15.0	0.0
Queue Length 95th (m)	#59.1	46.2	103.1	3.4	29.4	0.0
Internal Link Dist (m)		1174.8	1361.6			
Turn Bay Length (m)	130.0			85.0	85.0	85.0
Base Capacity (vph)	320	3187	2477	918	697	866
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	0.76	0.43	0.69	0.07	0.16	0.09

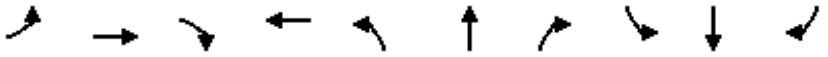
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	244	1362	0	0	1711	64	0	0	0	109	0	80
Future Volume (vph)	244	1362	0	0	1711	64	0	0	0	109	0	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5			4.5	4.5				5.2		5.2
Lane Util. Factor	1.00	*0.80			*0.80	1.00				1.00		1.00
Frt	1.00	1.00			1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1789	4476			4520	1601				1789		1601
Flt Permitted	0.08	1.00			1.00	1.00				0.76		1.00
Satd. Flow (perm)	157	4476			4520	1601				1426		1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	244	1362	0	0	1711	64	0	0	0	109	0	80
RTOR Reduction (vph)	0	0	0	0	0	29	0	0	0	0	0	67
Lane Group Flow (vph)	244	1362	0	0	1711	35	0	0	0	109	0	13
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm				Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	57.1	54.6			41.6	41.6				13.2		13.2
Effective Green, g (s)	58.1	56.6			43.6	43.6				13.2		13.2
Actuated g/C Ratio	0.73	0.71			0.55	0.55				0.17		0.17
Clearance Time (s)	4.0	6.5			6.5	6.5				5.2		5.2
Vehicle Extension (s)	3.0	5.0			5.0	5.0				5.0		5.0
Lane Grp Cap (vph)	320	3186			2478	878				236		265
v/s Ratio Prot	c0.10	0.30			0.38							
v/s Ratio Perm	c0.46					0.02				c0.08		0.01
v/c Ratio	0.76	0.43			0.69	0.04				0.46		0.05
Uniform Delay, d1	19.3	4.7			13.0	8.3				29.9		27.9
Progression Factor	1.00	1.00			1.00	1.00				1.00		1.00
Incremental Delay, d2	10.3	0.2			1.1	0.0				3.0		0.2
Delay (s)	29.6	4.9			14.1	8.3				32.9		28.0
Level of Service	C	A			B	A				C		C
Approach Delay (s)		8.7			13.9			0.0			30.9	
Approach LOS		A			B			A			C	

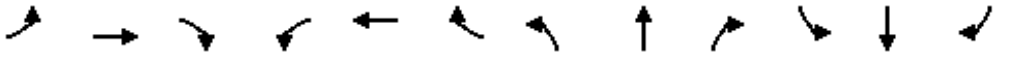
Intersection Summary			
HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	79.5	Sum of lost time (s)	10.7
Intersection Capacity Utilization	63.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	283	1048	238	1763	94	53	96	242	196	91
v/c Ratio	0.79	0.35	0.20	0.79	0.50	0.17	0.27	0.78	0.60	0.25
Control Delay	51.9	9.5	1.5	32.1	49.9	48.2	3.8	63.8	58.6	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.9	9.5	1.5	32.1	49.9	48.2	3.8	63.8	58.6	2.9
Queue Length 50th (m)	53.9	43.3	0.0	157.5	19.8	12.1	0.0	55.7	48.0	0.0
Queue Length 95th (m)	#103.2	62.5	9.0	201.7	34.5	24.2	4.3	81.8	72.5	3.0
Internal Link Dist (m)		1361.6		653.2		218.8			343.3	
Turn Bay Length (m)	85.0		85.0		85.0		85.0	85.0		85.0
Base Capacity (vph)	370	3023	1167	2223	188	556	549	311	570	560
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.35	0.20	0.79	0.50	0.10	0.17	0.78	0.34	0.16

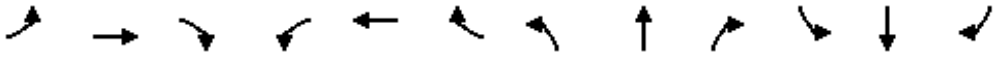
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	283	1048	238	0	1763	0	94	53	96	242	196	91
Future Volume (vph)	283	1048	238	0	1763	0	94	53	96	242	196	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9		4.9		4.5	3.2	5.2	4.5	3.2	5.2
Lane Util. Factor	1.00	*0.80	1.00		*0.80		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85		1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	4433	1601		4520		1789	1883	1601	1789	1883	1601
Flt Permitted	0.06	1.00	1.00		1.00		0.34	1.00	1.00	0.68	1.00	1.00
Satd. Flow (perm)	112	4433	1601		4520		645	1883	1601	1286	1883	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	283	1048	238	0	1763	0	94	53	96	242	196	91
RTOR Reduction (vph)	0	0	76	0	0	0	0	0	82	0	0	77
Lane Group Flow (vph)	283	1048	162	0	1763	0	94	53	14	242	196	14
Heavy Vehicles (%)	2%	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	88.2	88.2	88.2		63.1		26.4	19.9	19.9	28.4	20.9	20.9
Effective Green, g (s)	89.2	90.2	90.2		65.1		26.4	21.9	19.9	28.4	22.9	20.9
Actuated g/C Ratio	0.67	0.68	0.68		0.49		0.20	0.17	0.15	0.21	0.17	0.16
Clearance Time (s)	4.0	6.9	6.9		6.9		4.5	5.2	5.2	4.5	5.2	5.2
Vehicle Extension (s)	3.0	5.0	5.0		5.0		3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	355	3024	1092		2225		185	311	240	304	326	253
v/s Ratio Prot	c0.13	0.24			0.39		0.02	0.03		c0.05	0.10	
v/s Ratio Perm	c0.40		0.10				0.08		0.01	c0.13		0.01
v/c Ratio	0.80	0.35	0.15		0.79		0.51	0.17	0.06	0.80	0.60	0.06
Uniform Delay, d1	39.9	8.7	7.4		27.9		45.0	47.4	48.1	48.4	50.4	47.3
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.8	0.1	0.1		2.3		2.2	0.5	0.2	13.4	4.5	0.2
Delay (s)	51.6	8.9	7.6		30.2		47.2	47.9	48.4	61.9	55.0	47.5
Level of Service	D	A	A		C		D	D	D	E	D	D
Approach Delay (s)		16.4			30.2			47.8			56.8	
Approach LOS		B			C			D			E	

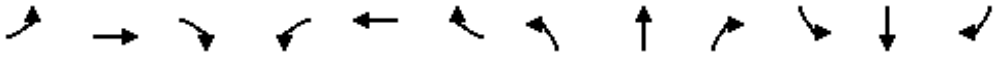
Intersection Summary			
HCM 2000 Control Delay	29.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	132.2	Sum of lost time (s)	15.6
Intersection Capacity Utilization	85.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	275	853	257	347	1389	179	393	1304	78	219	1363	414
v/c Ratio	0.88	0.64	0.40	0.75	0.90	0.27	0.89	0.78	0.12	0.78	0.92	0.63
Control Delay	89.8	45.3	9.0	69.0	52.6	7.2	82.8	42.7	1.3	81.8	56.8	25.1
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	89.8	45.3	9.0	69.0	52.6	7.2	82.8	42.7	1.3	81.8	56.8	25.1
Queue Length 50th (m)	39.4	86.6	6.2	47.8	151.8	2.9	56.0	132.0	0.0	31.1	151.6	51.5
Queue Length 95th (m)	#63.5	104.0	28.2	64.4	175.1	19.2	#83.2	153.0	2.8	#49.3	#183.4	88.0
Internal Link Dist (m)		653.2			686.5			2451.0			163.2	
Turn Bay Length (m)	130.0		85.0	85.0		95.0	85.0		85.0	230.0		85.0
Base Capacity (vph)	314	1339	637	495	1546	655	441	1682	671	282	1475	654
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	0.88	0.64	0.40	0.70	0.90	0.27	0.89	0.78	0.12	0.78	0.92	0.63

Intersection Summary

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



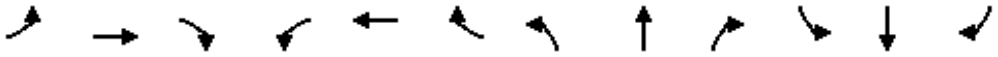
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	275	853	257	347	1389	179	393	1304	78	219	1363	414
Future Volume (vph)	275	853	257	347	1389	179	393	1304	78	219	1363	414
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	3.0	5.4	5.4	3.0	5.4	5.4
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3471	4476	1601	3471	4520	1601	3471	4520	1601	3471	4520	1601
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3471	4476	1601	3471	4520	1601	3471	4520	1601	3471	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	275	853	257	347	1389	179	393	1304	78	219	1363	414
RTOR Reduction (vph)	0	0	158	0	0	107	0	0	49	0	0	132
Lane Group Flow (vph)	275	853	99	347	1389	72	393	1304	29	219	1363	282
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	11.7	39.9	39.9	17.7	45.9	45.9	16.8	50.1	50.1	10.4	43.7	43.7
Effective Green, g (s)	12.7	41.9	41.9	18.7	47.9	47.9	17.8	52.1	52.1	11.4	45.7	45.7
Actuated g/C Ratio	0.09	0.30	0.30	0.13	0.34	0.34	0.13	0.37	0.37	0.08	0.33	0.33
Clearance Time (s)	4.0	6.5	6.5	4.0	6.5	6.5	4.0	7.4	7.4	4.0	7.4	7.4
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	5.0	5.0
Lane Grp Cap (vph)	314	1339	479	463	1546	547	441	1682	595	282	1475	522
v/s Ratio Prot	c0.08	0.19		c0.10	c0.31		c0.11	0.29		0.06	c0.30	
v/s Ratio Perm			0.06			0.04			0.02			0.18
v/c Ratio	0.88	0.64	0.21	0.75	0.90	0.13	0.89	0.78	0.05	0.78	0.92	0.54
Uniform Delay, d1	62.9	42.5	36.6	58.4	43.7	31.7	60.1	38.8	28.1	63.1	45.5	38.6
Progression 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
Incremental Delay, d2	22.8	1.4	0.4	6.6	7.8	0.2	19.7	2.3	0.0	12.6	10.5	2.0
Delay (s)	85.6	43.9	37.1	64.9	51.6	31.9	79.8	41.1	28.1	75.6	55.9	40.6
Level of Service	F	D	D	E	D	C	E	D	C	E	E	D
Approach Delay (s)		50.9			52.1			49.1			54.9	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	51.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.9
Intersection Capacity Utilization	87.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	150	956	43	144	1530	159	28	80	161	217	357
v/c Ratio	0.66	0.45	0.06	0.43	0.70	0.19	0.10	0.14	0.42	0.41	0.70
Control Delay	29.5	16.4	1.8	12.9	20.7	3.4	22.2	19.5	27.7	25.9	23.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.5	16.4	1.8	12.9	20.7	3.4	22.2	19.5	27.7	25.9	23.9
Queue Length 50th (m)	9.3	40.7	0.0	8.8	77.7	0.0	3.4	8.5	21.7	28.8	32.4
Queue Length 95th (m)	#43.7	68.3	2.8	22.7	125.0	11.0	9.2	17.7	37.7	46.6	60.5
Internal Link Dist (m)		686.5			658.0			300.4		386.3	
Turn Bay Length (m)	125.0		85.0	135.0		85.0	122.0				85.0
Base Capacity (vph)	226	2261	805	333	2328	901	434	864	604	815	734
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.42	0.05	0.43	0.66	0.18	0.06	0.09	0.27	0.27	0.49

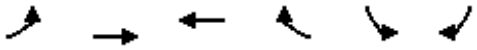
Intersection Summary

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



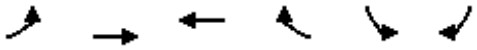
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	956	43	144	1530	159	28	68	12	161	217	357
Future Volume (vph)	150	956	43	144	1530	159	28	68	12	161	217	357
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.5	3.5		4.5	3.5	5.5
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1659	4350	1484	1789	4520	1601	1789	1841		1789	1746	1484
Flt Permitted	0.10	1.00	1.00	0.20	1.00	1.00	0.51	1.00		0.70	1.00	1.00
Satd. Flow (perm)	172	4350	1484	384	4520	1601	954	1841		1328	1746	1484
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	150	956	43	144	1530	159	28	68	12	161	217	357
RTOR Reduction (vph)	0	0	22	0	0	82	0	7	0	0	0	99
Lane Group Flow (vph)	150	956	21	144	1530	77	28	73	0	161	217	258
Heavy Vehicles (%)	10%	6%	10%	2%	2%	2%	2%	2%	2%	2%	10%	10%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	45.6	39.5	39.5	44.8	39.1	39.1	23.8	23.8		23.8	23.8	23.8
Effective Green, g (s)	47.6	41.5	41.5	46.8	41.1	41.1	24.8	25.8		24.8	25.8	23.8
Actuated g/C Ratio	0.56	0.49	0.49	0.55	0.48	0.48	0.29	0.30		0.29	0.30	0.28
Clearance Time (s)	4.0	6.5	6.5	4.0	6.5	6.5	5.5	5.5		5.5	5.5	5.5
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	5.0	5.0		5.0	5.0	5.0
Lane Grp Cap (vph)	220	2123	724	322	2185	774	278	558		387	529	415
v/s Ratio Prot	c0.06	0.22		0.04	c0.34			0.04			0.12	
v/s Ratio Perm	0.32		0.01	0.21		0.05	0.03			0.12		c0.17
v/c Ratio	0.68	0.45	0.03	0.45	0.70	0.10	0.10	0.13		0.42	0.41	0.62
Uniform Delay, d1	13.2	14.3	11.3	9.8	17.1	11.9	22.0	21.5		24.3	23.5	26.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	8.4	0.2	0.0	1.0	1.1	0.1	0.3	0.2		1.5	1.1	4.1
Delay (s)	21.7	14.5	11.3	10.8	18.2	12.0	22.3	21.7		25.8	24.6	30.7
Level of Service	C	B	B	B	B	B	C	C		C	C	C
Approach Delay (s)		15.3			17.1			21.8			27.8	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	112	1018	1549	353	373	284
v/c Ratio	0.38	0.39	0.79	0.43	0.33	0.42
Control Delay	10.7	8.7	19.9	3.6	16.6	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.7	8.7	19.9	3.6	16.6	7.1
Queue Length 50th (m)	5.4	21.1	53.9	0.0	16.1	5.2
Queue Length 95th (m)	11.5	28.4	70.1	13.5	25.6	20.4
Internal Link Dist (m)		658.0	685.0		264.0	
Turn Bay Length (m)	125.0			85.0		
Base Capacity (vph)	293	2959	2049	850	1137	670
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	0.38	0.34	0.76	0.42	0.33	0.42

Intersection Summary



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	112	1018	1549	353	373	284
Future Volume (vph)	112	1018	1549	353	373	284
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.91	0.91	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1789	5142	5142	1601	3471	1601
Flt Permitted	0.15	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	288	5142	5142	1601	3471	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	112	1018	1549	353	373	284
RTOR Reduction (vph)	0	0	0	221	0	147
Lane Group Flow (vph)	112	1018	1549	132	373	137
Turn Type	pm+pt	NA	NA	Perm	Perm	Perm
Protected Phases	7	4	8			
Permitted Phases	4			8	6	6
Actuated Green, G (s)	30.4	30.4	21.7	21.7	18.7	18.7
Effective Green, g (s)	30.4	30.4	21.7	21.7	18.7	18.7
Actuated g/C Ratio	0.52	0.52	0.37	0.37	0.32	0.32
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	259	2690	1920	597	1117	515
v/s Ratio Prot	0.03	c0.20	c0.30			
v/s Ratio Perm	0.20			0.08	c0.11	0.09
v/c Ratio	0.43	0.38	0.81	0.22	0.33	0.27
Uniform Delay, d1	9.9	8.2	16.3	12.4	15.0	14.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	0.1	2.6	0.2	0.8	1.3
Delay (s)	11.0	8.3	18.9	12.6	15.8	15.9
Level of Service	B	A	B	B	B	B
Approach Delay (s)		8.6	17.7		15.8	
Approach LOS		A	B		B	

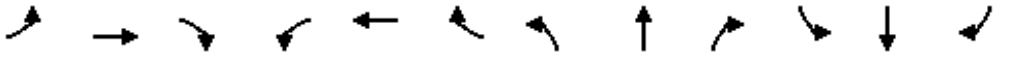
Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	58.1	Sum of lost time (s)	13.5
Intersection Capacity Utilization	58.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	15	1233	143	13	1725	417	91	182	252	303	87
v/c Ratio	0.08	0.57	0.17	0.06	0.74	0.42	0.60	0.23	0.67	0.65	0.20
Control Delay	13.3	21.2	3.8	12.9	25.1	5.6	68.3	33.0	57.8	43.9	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.3	21.2	3.8	12.9	25.1	5.6	68.3	33.0	57.8	43.9	6.0
Queue Length 50th (m)	1.3	64.5	0.0	1.1	103.1	7.1	17.8	14.7	25.1	54.4	0.0
Queue Length 95th (m)	5.0	118.5	11.6	4.7	184.4	33.8	#46.5	26.4	#47.9	91.0	9.4
Internal Link Dist (m)		685.0			1030.1			436.1		413.0	
Turn Bay Length (m)	85.0		85.0	85.0		85.0	85.0		85.0		85.0
Base Capacity (vph)	185	2168	858	232	2338	992	160	1290	405	736	659
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.57	0.17	0.06	0.74	0.42	0.57	0.14	0.62	0.41	0.13

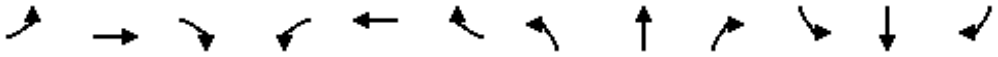
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	1233	143	13	1725	417	91	161	21	252	303	87
Future Volume (vph)	15	1233	143	13	1725	417	91	161	21	252	303	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5	4.5	3.0	4.5	4.5	4.5	3.2		4.5	3.2	5.2
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	0.95		0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1659	4192	1526	1690	4520	1601	1772	3517		3471	1883	1601
Flt Permitted	0.07	1.00	1.00	0.12	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	127	4192	1526	219	4520	1601	1772	3517		3471	1883	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	15	1233	143	13	1725	417	91	161	21	252	303	87
RTOR Reduction (vph)	0	0	71	0	0	169	0	9	0	0	0	67
Lane Group Flow (vph)	15	1233	72	13	1725	248	91	173	0	252	303	20
Heavy Vehicles (%)	10%	10%	7%	8%	2%	2%	3%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6						4
Actuated Green, G (s)	56.5	54.0	54.0	56.5	54.0	54.0	9.2	22.3		11.8	24.9	24.9
Effective Green, g (s)	58.5	56.0	56.0	58.5	56.0	56.0	9.2	24.3		11.8	26.9	24.9
Actuated g/C Ratio	0.53	0.51	0.51	0.53	0.51	0.51	0.08	0.22		0.11	0.24	0.22
Clearance Time (s)	4.0	6.5	6.5	4.0	6.5	6.5	4.5	5.2		4.5	5.2	5.2
Vehicle Extension (s)	2.5	5.0	5.0	2.5	5.0	5.0	3.0	5.0		3.0	5.0	5.0
Lane Grp Cap (vph)	115	2118	771	162	2284	809	147	771		369	457	359
v/s Ratio Prot	c0.00	0.29		0.00	c0.38		0.05	0.05		c0.07	c0.16	
v/s Ratio Perm	0.06		0.05	0.04		0.16						0.01
v/c Ratio	0.13	0.58	0.09	0.08	0.76	0.31	0.62	0.22		0.68	0.66	0.05
Uniform Delay, d1	17.3	19.2	14.2	13.9	21.9	16.0	49.1	35.5		47.7	37.9	33.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.4	0.6	0.1	0.2	1.7	0.5	7.5	0.3		5.2	4.7	0.1
Delay (s)	17.7	19.8	14.3	14.0	23.7	16.5	56.7	35.8		52.8	42.6	33.8
Level of Service	B	B	B	B	C	B	E	D		D	D	C
Approach Delay (s)		19.2			22.2			42.8			45.4	
Approach LOS		B			C			D			D	

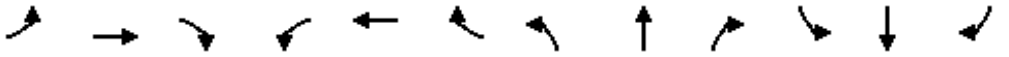
Intersection Summary			
HCM 2000 Control Delay	25.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	110.8	Sum of lost time (s)	15.2
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	57	1004	486	350	1623	610	446	1490	238	237	1281	134
v/c Ratio	0.37	0.75	0.76	0.86	0.93	0.70	0.92	0.88	0.34	0.73	0.86	0.22
Control Delay	73.9	49.4	31.6	82.5	53.2	27.0	86.3	48.8	12.9	77.0	51.7	4.5
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	73.9	49.4	31.6	82.5	53.2	27.0	86.3	48.8	12.9	77.0	51.7	4.5
Queue Length 50th (m)	8.3	107.5	68.8	51.6	186.9	111.7	66.2	167.9	16.0	34.6	144.2	0.0
Queue Length 95th (m)	15.9	126.7	113.0	#76.5	#223.1	157.3	#97.5	191.6	37.0	49.1	166.8	11.2
Internal Link Dist (m)		309.3			173.0			421.7			476.7	
Turn Bay Length (m)	50.0		70.0	90.0		70.0	165.0		70.0	140.0		70.0
Base Capacity (vph)	156	1398	659	413	1745	882	486	1697	702	340	1493	613
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	0.37	0.72	0.74	0.85	0.93	0.69	0.92	0.88	0.34	0.70	0.86	0.22

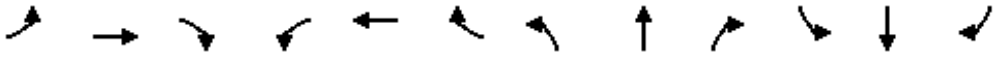
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	1004	486	350	1623	610	446	1490	238	237	1281	134
Future Volume (vph)	57	1004	486	350	1623	610	446	1490	238	237	1281	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	2.0	3.0	4.9	4.9	3.0	4.9	4.9
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3437	4476	1601	3471	4520	1601	3471	4476	1601	3471	4476	1541
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3437	4476	1601	3471	4520	1601	3471	4476	1601	3471	4476	1541
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	57	1004	486	350	1623	610	446	1490	238	237	1281	134
RTOR Reduction (vph)	0	0	161	0	0	47	0	0	96	0	0	90
Lane Group Flow (vph)	57	1004	325	350	1623	563	446	1490	142	237	1281	44
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%	2%	3%	2%	2%	3%	6%
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	4.3	41.5	41.5	15.8	53.0	65.4	18.9	52.2	52.2	12.4	45.7	45.7
Effective Green, g (s)	5.3	43.5	43.5	16.8	55.0	69.4	19.9	54.2	54.2	13.4	47.7	47.7
Actuated g/C Ratio	0.04	0.30	0.30	0.12	0.38	0.48	0.14	0.38	0.38	0.09	0.33	0.33
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	4.0	4.0	6.9	6.9	4.0	6.9	6.9
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	3.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	126	1354	484	405	1729	773	480	1688	603	323	1485	511
v/s Ratio Prot	0.02	0.22		c0.10	c0.36	0.07	c0.13	c0.33		0.07	0.29	
v/s Ratio Perm			0.20			0.28			0.09			0.03
v/c Ratio	0.45	0.74	0.67	0.86	0.94	0.73	0.93	0.88	0.24	0.73	0.86	0.09
Uniform Delay, d1	67.8	45.0	43.8	62.3	42.7	29.6	61.2	41.8	30.6	63.4	44.9	33.0
Progression 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
Incremental Delay, d2	2.6	2.4	4.0	17.1	10.4	3.5	24.3	7.1	0.9	8.4	6.9	0.3
Delay (s)	70.3	47.4	47.8	79.5	53.2	33.1	85.5	48.9	31.5	71.8	51.8	33.4
Level of Service	E	D	D	E	D	C	F	D	C	E	D	C
Approach Delay (s)		48.4			52.0			54.5			53.2	
Approach LOS		D			D			D			D	

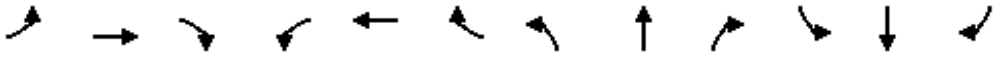
Intersection Summary			
HCM 2000 Control Delay	52.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	143.7	Sum of lost time (s)	15.8
Intersection Capacity Utilization	87.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	184	782	184	284	1134	114	287	1298	172	195	1529	195
v/c Ratio	0.44	0.67	0.30	0.67	0.97	0.19	0.99	0.78	0.25	0.82	0.96	0.30
Control Delay	57.6	42.0	10.8	63.3	64.0	5.1	111.7	41.5	7.9	86.3	57.0	11.5
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	57.6	42.0	10.8	63.3	64.0	5.1	111.7	41.5	7.9	86.3	57.0	11.5
Queue Length 50th (m)	23.0	92.8	8.0	36.4	152.5	0.0	38.8	122.7	4.6	26.0	159.5	10.2
Queue Length 95th (m)	36.0	116.3	25.7	52.5	#195.5	11.2	#71.2	152.9	20.7	#47.9	#210.5	29.3
Internal Link Dist (m)		214.6			322.8			302.9			114.0	
Turn Bay Length (m)	85.0		140.0	85.0		85.0	115.0		85.0	85.0		85.0
Base Capacity (vph)	773	1463	737	480	1169	606	289	1656	678	239	1591	652
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	0.24	0.53	0.25	0.59	0.97	0.19	0.99	0.78	0.25	0.82	0.96	0.30

Intersection Summary

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



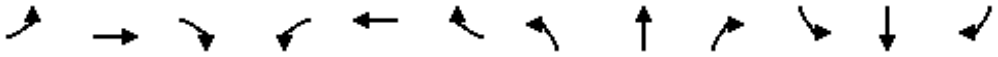
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	184	782	184	284	1134	114	287	1298	172	195	1529	195
Future Volume (vph)	184	782	184	284	1134	114	287	1298	172	195	1529	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.8	3.8	3.0	3.8	3.8	3.0	5.4	5.4	3.0	5.4	5.4
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3404	3579	1601	3471	3579	1601	3471	4520	1601	3471	4520	1601
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3404	3579	1601	3471	3579	1601	3471	4520	1601	3471	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	184	782	184	284	1134	114	287	1298	172	195	1529	195
RTOR Reduction (vph)	0	0	94	0	0	77	0	0	91	0	0	88
Lane Group Flow (vph)	184	782	90	284	1134	37	287	1298	81	195	1529	107
Heavy Vehicles (%)	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	15.2	41.1	41.1	15.3	41.2	41.2	10.0	46.4	46.4	8.1	44.5	44.5
Effective Green, g (s)	16.2	43.1	43.1	16.3	43.2	43.2	11.0	48.4	48.4	9.1	46.5	46.5
Actuated g/C Ratio	0.12	0.33	0.33	0.12	0.33	0.33	0.08	0.37	0.37	0.07	0.35	0.35
Clearance Time (s)	4.0	5.8	5.8	4.0	5.8	5.8	4.0	7.4	7.4	4.0	7.4	7.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	417	1167	522	428	1170	523	289	1656	586	239	1591	563
v/s Ratio Prot	0.05	0.22		c0.08	c0.32		c0.08	0.29		0.06	c0.34	
v/s Ratio Perm			0.06			0.02			0.05			0.07
v/c Ratio	0.44	0.67	0.17	0.66	0.97	0.07	0.99	0.78	0.14	0.82	0.96	0.19
Uniform Delay, d1	53.8	38.4	31.8	55.3	43.8	30.6	60.5	37.2	27.9	60.7	41.9	29.7
Progression 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
Incremental Delay, d2	0.7	1.5	0.2	3.9	19.1	0.1	51.0	2.9	0.2	18.9	14.6	0.3
Delay (s)	54.5	39.9	31.9	59.1	62.9	30.7	111.5	40.1	28.2	79.6	56.5	30.1
Level of Service	D	D	C	E	E	C	F	D	C	E	E	C
Approach Delay (s)		41.0			59.8			50.6			56.2	
Approach LOS		D			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	52.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	132.1	Sum of lost time (s)	15.2
Intersection Capacity Utilization	96.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	117	12	267	82	182	187	1505	208	57	1519	392
v/c Ratio	0.71	0.04	0.70	0.34	0.46	0.63	0.56	0.20	0.24	0.68	0.39
Control Delay	52.8	25.3	25.0	31.1	13.0	22.6	12.0	2.2	7.5	17.0	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.8	25.3	25.0	31.1	13.0	22.6	12.0	2.2	7.5	17.0	2.8
Queue Length 50th (m)	16.1	1.5	17.9	10.5	6.0	9.3	57.0	0.0	2.0	64.8	0.0
Queue Length 95th (m)	32.5	5.6	41.0	22.0	21.6	#39.0	87.5	9.8	6.5	97.5	14.0
Internal Link Dist (m)		483.8			361.2		451.9			2451.0	
Turn Bay Length (m)	85.0		85.0	85.0		85.0		85.0	85.0		85.0
Base Capacity (vph)	468	917	847	688	871	300	2689	1036	234	2250	994
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.01	0.32	0.12	0.21	0.62	0.56	0.20	0.24	0.68	0.39

Intersection Summary

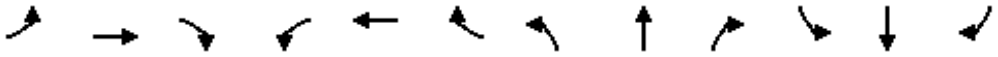
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	117	12	267	82	29	153	187	1505	208	57	1519	392
Future Volume (vph)	117	12	267	82	29	153	187	1505	208	57	1519	392
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.6	4.6		4.5	7.6	7.6	4.5	7.6	7.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	1883	1601	1789	1646		1789	4520	1601	1789	4520	1601
Flt Permitted	0.51	1.00	1.00	0.75	1.00		0.09	1.00	1.00	0.12	1.00	1.00
Satd. Flow (perm)	961	1883	1601	1412	1646		170	4520	1601	217	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	117	12	267	82	29	153	187	1505	208	57	1519	392
RTOR Reduction (vph)	0	0	109	0	111	0	0	0	87	0	0	192
Lane Group Flow (vph)	117	12	158	82	71	0	187	1505	121	57	1519	200
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2		2	6		6
Actuated Green, G (s)	13.1	13.1	13.1	13.1	13.1		52.7	45.3	45.3	42.7	39.8	39.8
Effective Green, g (s)	13.1	13.1	13.1	13.1	13.1		52.7	45.3	45.3	42.7	39.8	39.8
Actuated g/C Ratio	0.17	0.17	0.17	0.17	0.17		0.68	0.58	0.58	0.55	0.51	0.51
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6		4.5	7.6	7.6	4.5	7.6	7.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	161	316	268	237	276		289	2625	929	177	2306	816
v/s Ratio Prot		0.01			0.04		c0.07	0.33		0.01	0.34	
v/s Ratio Perm	c0.12		0.10	0.06			c0.37		0.08	0.16		0.12
v/c Ratio	0.73	0.04	0.59	0.35	0.26		0.65	0.57	0.13	0.32	0.66	0.25
Uniform Delay, d1	30.8	27.2	30.0	28.7	28.2		11.7	10.3	7.4	8.4	14.1	10.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.0	0.0	3.3	0.9	0.5		4.9	0.9	0.3	1.1	1.5	0.7
Delay (s)	45.8	27.2	33.3	29.5	28.7		16.7	11.2	7.7	9.5	15.6	11.4
Level of Service	D	C	C	C	C		B	B	A	A	B	B
Approach Delay (s)		36.8			29.0			11.3			14.6	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	78.0	Sum of lost time (s)	16.7
Intersection Capacity Utilization	74.9%	ICU Level of Service	D
Analysis Period (min)	15		

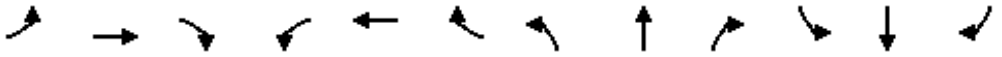
c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	119	1112	395	352	1875	547	307	1094	323	288	1367	99
v/c Ratio	0.67	0.72	0.58	0.73	0.97	0.67	0.99	0.82	0.50	0.80	0.98	0.17
Control Delay	85.9	44.9	22.3	68.9	54.5	23.0	112.8	53.1	13.3	80.7	67.9	3.2
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	85.9	44.9	22.3	68.9	54.5	23.0	112.8	53.1	13.3	80.7	67.9	3.2
Queue Length 50th (m)	17.6	116.8	45.7	50.2	216.4	73.9	46.1	121.7	16.8	42.3	162.0	0.0
Queue Length 95th (m)	#30.1	136.5	79.8	67.2	#257.4	116.0	#76.8	142.5	45.0	#62.7	#199.0	7.5
Internal Link Dist (m)		888.5			759.7			657.0			690.8	
Turn Bay Length (m)	130.0		110.0	300.0		70.0	110.0		70.0	130.0		85.0
Base Capacity (vph)	177	1540	682	502	1938	817	311	1339	650	359	1401	587
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	0.67	0.72	0.58	0.70	0.97	0.67	0.99	0.82	0.50	0.80	0.98	0.17

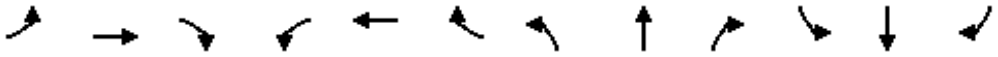
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	119	1112	395	352	1875	547	307	1094	323	288	1367	99
Future Volume (vph)	119	1112	395	352	1875	547	307	1094	323	288	1367	99
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.8	5.8	3.0	5.8	5.8	3.0	4.6	4.6	3.0	4.6	4.6
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3219	4476	1601	3471	4520	1601	3471	4476	1601	3471	4476	1601
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3219	4476	1601	3471	4520	1601	3471	4476	1601	3471	4476	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	119	1112	395	352	1875	547	307	1094	323	288	1367	99
RTOR Reduction (vph)	0	0	131	0	0	131	0	0	171	0	0	68
Lane Group Flow (vph)	119	1112	264	352	1875	416	307	1094	152	288	1367	31
Heavy Vehicles (%)	10%	3%	2%	2%	2%	2%	2%	3%	2%	2%	3%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	7.0	47.9	47.9	19.3	60.2	60.2	12.0	41.4	41.4	14.0	43.4	43.4
Effective Green, g (s)	8.0	49.9	49.9	20.3	62.2	62.2	13.0	43.4	43.4	15.0	45.4	45.4
Actuated g/C Ratio	0.06	0.34	0.34	0.14	0.43	0.43	0.09	0.30	0.30	0.10	0.31	0.31
Clearance Time (s)	4.0	7.8	7.8	4.0	7.8	7.8	4.0	6.6	6.6	4.0	6.6	6.6
Vehicle Extension (s)	5.0	3.0	3.0	5.0	3.0	3.0	4.0	5.0	5.0	4.0	5.0	5.0
Lane Grp Cap (vph)	177	1540	550	485	1938	686	311	1339	479	359	1401	501
v/s Ratio Prot	0.04	0.25		c0.10	c0.41		c0.09	0.24		0.08	c0.31	
v/s Ratio Perm			0.16			0.26			0.09			0.02
v/c Ratio	0.67	0.72	0.48	0.73	0.97	0.61	0.99	0.82	0.32	0.80	0.98	0.06
Uniform Delay, d1	67.2	41.5	37.4	59.7	40.4	32.0	65.9	47.1	39.3	63.5	49.3	34.9
Progression 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
Incremental Delay, d2	12.4	1.7	0.7	6.5	13.5	1.5	47.2	4.5	0.8	12.8	18.6	0.1
Delay (s)	79.6	43.2	38.0	66.2	53.9	33.5	113.1	51.6	40.1	76.4	67.8	35.0
Level of Service	E	D	D	E	D	C	F	D	D	E	E	C
Approach Delay (s)		44.6			51.4			60.4			67.4	
Approach LOS		D			D			E			E	

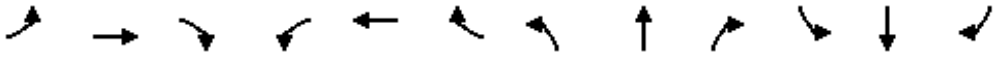
Intersection Summary			
HCM 2000 Control Delay	55.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	92.6%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	74	52	12	252	143	323	136	2112	264	167	1594	73
v/c Ratio	0.32	0.13	0.05	0.80	0.29	0.66	0.55	0.80	0.21	0.70	0.60	0.07
Control Delay	37.5	45.2	0.3	57.4	43.7	34.3	22.7	21.1	1.1	37.6	16.3	0.4
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	37.5	45.2	0.3	57.4	43.7	34.3	22.7	21.1	1.1	37.6	16.3	0.4
Queue Length 50th (m)	12.6	5.4	0.0	47.4	14.6	47.9	9.7	146.5	0.0	18.2	89.5	0.0
Queue Length 95th (m)	24.7	11.4	0.0	#83.5	24.2	78.5	28.3	171.5	6.9	#45.5	111.2	0.9
Internal Link Dist (m)		1074.9			770.5			396.6			272.1	
Turn Bay Length (m)	85.0		85.0	120.0		85.0	170.0		70.0	170.0		70.0
Base Capacity (vph)	229	397	250	314	520	503	287	2643	1242	257	2642	989
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	0.32	0.13	0.05	0.80	0.28	0.64	0.47	0.80	0.21	0.65	0.60	0.07

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	52	12	252	143	323	136	2112	264	167	1594	73
Future Volume (vph)	74	52	12	252	143	323	136	2112	264	167	1594	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.4	7.4	3.0	5.4	4.0	3.0	3.6	2.0	3.0	3.6	3.6
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	3510	1601	1789	3579	1601	1789	4520	1601	1789	4520	1601
Flt Permitted	0.66	1.00	1.00	0.54	1.00	1.00	0.07	1.00	1.00	0.07	1.00	1.00
Satd. Flow (perm)	1246	3510	1601	1013	3579	1601	136	4520	1601	123	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	74	52	12	252	143	323	136	2112	264	167	1594	73
RTOR Reduction (vph)	0	0	11	0	0	56	0	0	83	0	0	31
Lane Group Flow (vph)	74	52	1	252	143	267	136	2112	181	167	1594	42
Heavy Vehicles (%)	2%	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	pm+ov	pm+pt	NA	pm+ov	pm+pt	NA	Perm
Protected Phases	7	8		3	4	1	5	2	3	1	6	
Permitted Phases	8		8	4		4	2		2	6		6
Actuated Green, G (s)	11.8	7.8	7.8	21.8	13.3	22.3	69.2	60.2	70.2	69.2	60.2	60.2
Effective Green, g (s)	13.8	9.8	7.8	22.8	15.3	22.3	71.2	62.2	74.2	71.2	62.2	62.2
Actuated g/C Ratio	0.13	0.09	0.07	0.21	0.14	0.21	0.66	0.58	0.69	0.66	0.58	0.58
Clearance Time (s)	4.5	7.4	7.4	4.0	7.4	4.0	4.0	5.6	4.0	4.0	5.6	5.6
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	3.0	3.0	5.0	3.0	3.0	5.0	5.0
Lane Grp Cap (vph)	184	318	115	292	507	330	242	2603	1099	235	2603	922
v/s Ratio Prot	0.02	0.01		c0.09	0.04	c0.07	0.05	c0.47	0.02	0.07	0.35	
v/s Ratio Perm	0.03		0.00	c0.09		0.10	0.32		0.09	0.40		0.03
v/c Ratio	0.40	0.16	0.01	0.86	0.28	0.81	0.56	0.81	0.17	0.71	0.61	0.05
Uniform Delay, d1	42.9	45.3	46.5	39.9	41.4	40.8	13.4	18.2	6.0	26.0	15.0	10.0
Progression 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
Incremental Delay, d2	1.4	0.5	0.1	22.2	0.6	14.0	3.0	2.9	0.1	9.7	1.1	0.1
Delay (s)	44.3	45.8	46.6	62.0	42.1	54.8	16.4	21.1	6.0	35.7	16.1	10.1
Level of Service	D	D	D	E	D	D	B	C	A	D	B	B
Approach Delay (s)		45.1			54.8			19.3			17.6	
Approach LOS		D			D			B			B	

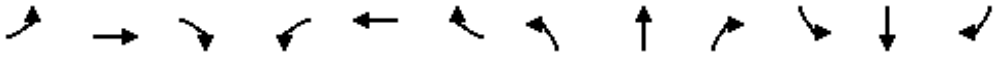
Intersection Summary			
HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	108.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX

F FUTURE TOTAL SYNCHRO OUTPUT REPORTS

Queues
1: Regional Road 25 & Britannia Road

10/25/2024

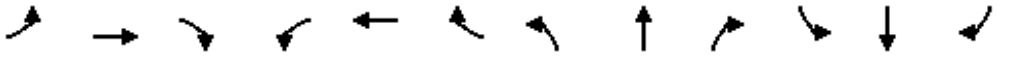


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	310	1537	209	598	1350	121	350	1063	499	332	1406	173
v/c Ratio	0.78	1.09	0.34	1.10	0.84	0.19	1.03	0.78	0.76	0.99	1.04	0.30
Control Delay	71.9	94.3	11.0	120.0	45.5	5.6	115.1	47.2	29.6	108.2	82.2	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.9	94.3	11.0	120.0	45.5	5.6	115.1	47.2	29.6	108.2	82.2	6.2
Queue Length 50th (m)	42.0	~191.0	9.1	~92.9	136.3	0.0	~51.2	107.5	64.5	46.3	~168.9	0.0
Queue Length 95th (m)	#62.3	#224.7	28.6	#129.1	158.3	12.8	#82.1	127.4	109.5	#77.2	#202.8	16.5
Internal Link Dist (m)		239.5			177.4			308.0			325.9	
Turn Bay Length (m)	142.0		89.0	147.0		118.0	120.0		132.0	120.0		115.0
Base Capacity (vph)	398	1416	612	544	1623	652	340	1362	654	334	1346	575
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	0.78	1.09	0.34	1.10	0.83	0.19	1.03	0.78	0.76	0.99	1.04	0.30

Intersection Summary

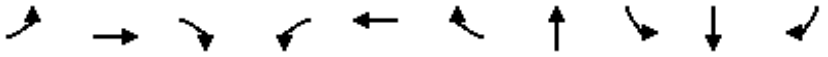
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	310	1537	209	598	1350	121	350	1063	499	332	1406	173
Future Volume (vph)	310	1537	209	598	1350	121	350	1063	499	332	1406	173
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3340	4520	1601	3340	4520	1601	3404	4391	1570	3471	4391	1484
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3340	4520	1601	3340	4520	1601	3404	4391	1570	3471	4391	1484
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	310	1537	209	598	1350	121	350	1063	499	332	1406	173
RTOR Reduction (vph)	0	0	111	0	0	78	0	0	168	0	0	120
Lane Group Flow (vph)	310	1537	98	598	1350	43	350	1063	331	332	1406	53
Heavy Vehicles (%)	6%	2%	2%	6%	2%	2%	4%	5%	4%	2%	5%	10%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	15.1	40.3	40.3	21.0	46.2	46.2	12.5	39.9	39.9	12.0	39.4	39.4
Effective Green, g (s)	16.1	42.3	42.3	22.0	48.2	48.2	13.5	41.9	41.9	13.0	41.4	41.4
Actuated g/C Ratio	0.12	0.31	0.31	0.16	0.36	0.36	0.10	0.31	0.31	0.10	0.31	0.31
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	3.2	3.2	3.0	3.2	3.2
Lane Grp Cap (vph)	398	1416	501	544	1613	571	340	1362	487	334	1346	455
v/s Ratio Prot	0.09	c0.34		c0.18	0.30		c0.10	0.24		0.10	c0.32	
v/s Ratio Perm			0.06			0.03			0.21			0.04
v/c Ratio	0.78	1.09	0.20	1.10	0.84	0.08	1.03	0.78	0.68	0.99	1.04	0.12
Uniform Delay, d1	57.7	46.4	33.9	56.5	39.8	28.7	60.8	42.4	40.7	61.0	46.8	33.7
Progression 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
Incremental Delay, d2	9.3	50.7	0.3	68.5	4.1	0.1	56.6	3.0	4.0	47.4	37.0	0.1
Delay (s)	67.0	97.1	34.2	125.0	43.9	28.8	117.3	45.4	44.7	108.3	83.8	33.8
Level of Service	E	F	C	F	D	C	F	D	D	F	F	C
Approach Delay (s)		86.1			66.5			58.4			83.6	
Approach LOS		F			E			E			F	

Intersection Summary			
HCM 2000 Control Delay	73.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	15.8
Intersection Capacity Utilization	98.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



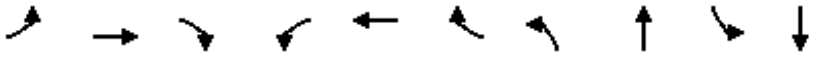
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	186	2043	169	9	1730	189	356	151	84	200
v/c Ratio	0.81	0.81	0.18	0.04	0.86	0.24	0.75	0.44	0.14	0.34
Control Delay	46.7	22.6	4.2	10.7	29.6	3.7	38.6	29.3	22.0	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.7	22.6	4.2	10.7	29.6	3.7	38.6	29.3	22.0	10.6
Queue Length 50th (m)	18.3	116.5	1.8	0.6	116.7	0.1	56.9	21.7	10.7	9.2
Queue Length 95th (m)	#62.8	#223.0	14.6	3.1	#178.1	12.6	88.3	38.6	20.6	24.6
Internal Link Dist (m)		1174.8			389.4		298.2		317.5	
Turn Bay Length (m)	130.0		85.0	85.0		85.0		85.0		85.0
Base Capacity (vph)	229	2524	958	201	2023	798	619	455	764	742
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.81	0.18	0.04	0.86	0.24	0.58	0.33	0.11	0.27

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	186	2043	169	9	1730	189	212	114	30	151	84	200
Future Volume (vph)	186	2043	169	9	1730	189	212	114	30	151	84	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.6	5.6	3.0	5.6	5.6		3.0		4.0	3.0	5.0
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (prot)	1789	4520	1601	1789	4391	1512		1796		1772	1746	1601
Flt Permitted	0.08	1.00	1.00	0.09	1.00	1.00		0.76		0.57	1.00	1.00
Satd. Flow (perm)	153	4520	1601	162	4391	1512		1410		1068	1746	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	186	2043	169	9	1730	189	212	114	30	151	84	200
RTOR Reduction (vph)	0	0	67	0	0	98	0	3	0	0	0	91
Lane Group Flow (vph)	186	2043	102	9	1730	91	0	353	0	151	84	109
Heavy Vehicles (%)	2%	2%	2%	2%	5%	8%	2%	2%	10%	3%	10%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	56.4	51.4	51.4	46.4	45.4	45.4		29.8		29.8	29.8	29.8
Effective Green, g (s)	57.4	53.4	53.4	48.4	47.4	47.4		31.8		30.8	31.8	29.8
Actuated g/C Ratio	0.58	0.54	0.54	0.49	0.48	0.48		0.32		0.31	0.32	0.30
Clearance Time (s)	4.0	7.6	7.6	4.0	7.6	7.6		5.0		5.0	5.0	5.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0		5.0		5.0	5.0	5.0
Lane Grp Cap (vph)	221	2442	865	112	2106	725		453		332	561	482
v/s Ratio Prot	c0.07	c0.45		0.00	0.39						0.05	
v/s Ratio Perm	0.42		0.06	0.04		0.06		c0.25		0.14		0.07
v/c Ratio	0.84	0.84	0.12	0.08	0.82	0.13		0.78		0.45	0.15	0.23
Uniform Delay, d1	22.6	19.0	11.1	17.3	22.1	14.2		30.3		27.3	23.9	25.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	24.1	3.6	0.3	0.3	3.8	0.4		9.6		2.1	0.3	0.5
Delay (s)	46.7	22.6	11.4	17.6	25.8	14.6		39.9		29.3	24.1	26.4
Level of Service	D	C	B	B	C	B		D		C	C	C
Approach Delay (s)		23.7			24.7			39.9			27.0	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	25.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	98.8	Sum of lost time (s)	11.6
Intersection Capacity Utilization	81.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



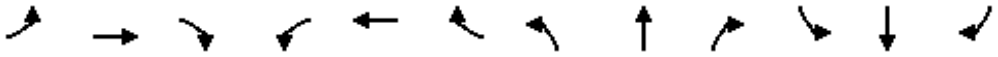
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	5	1974	213	35	1535	15	394	37	192	10
v/c Ratio	0.05	0.83	0.23	0.35	0.67	0.02	0.79	0.06	0.39	0.02
Control Delay	14.8	21.4	2.8	28.0	16.7	5.4	33.6	13.9	20.2	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.8	21.4	2.8	28.0	16.7	5.4	33.6	13.9	20.2	10.6
Queue Length 50th (m)	0.3	91.9	0.0	2.8	62.3	0.0	49.1	3.2	20.1	0.4
Queue Length 95th (m)	2.7	#177.7	11.4	#16.1	111.7	2.9	79.1	8.3	34.9	3.0
Internal Link Dist (m)		389.4			948.2			362.8		565.8
Turn Bay Length (m)	85.0		85.0	85.0		85.0	85.0		85.0	
Base Capacity (vph)	99	2367	940	99	2278	847	778	933	760	984
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.83	0.23	0.35	0.67	0.02	0.51	0.04	0.25	0.01

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1974	213	35	1535	15	394	7	30	192	5	5
Future Volume (vph)	5	1974	213	35	1535	15	394	7	30	192	5	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.6	5.6	5.6	6.6	5.6	5.6	3.6	2.6		3.6	2.6	
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1789	4520	1601	1789	4350	1601	1789	1654		1789	1742	
Flt Permitted	0.10	1.00	1.00	0.10	1.00	1.00	0.75	1.00		0.73	1.00	
Satd. Flow (perm)	194	4520	1601	194	4350	1601	1415	1654		1381	1742	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	1974	213	35	1535	15	394	7	30	192	5	5
RTOR Reduction (vph)	0	0	101	0	0	7	0	1	0	0	3	0
Lane Group Flow (vph)	5	1974	112	35	1535	8	394	36	0	192	7	0
Heavy Vehicles (%)	2%	2%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	37.8	37.8	37.8	37.8	37.8	37.8	25.9	25.9		25.9	25.9	
Effective Green, g (s)	38.8	39.8	39.8	38.8	39.8	39.8	26.9	27.9		26.9	27.9	
Actuated g/C Ratio	0.51	0.52	0.52	0.51	0.52	0.52	0.35	0.37		0.35	0.37	
Clearance Time (s)	7.6	7.6	7.6	7.6	7.6	7.6	4.6	4.6		4.6	4.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	99	2370	839	99	2281	839	501	607		489	640	
v/s Ratio Prot		c0.44			0.35			0.02			0.00	
v/s Ratio Perm	0.03		0.07	0.18		0.00	c0.28			0.14		
v/c Ratio	0.05	0.83	0.13	0.35	0.67	0.01	0.79	0.06		0.39	0.01	
Uniform Delay, d1	9.3	15.2	9.2	11.1	13.3	8.6	21.9	15.5		18.4	15.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	3.6	0.3	9.6	1.6	0.0	8.0	0.0		0.5	0.0	
Delay (s)	10.3	18.9	9.6	20.7	14.9	8.6	29.9	15.6		18.9	15.2	
Level of Service	B	B	A	C	B	A	C	B		B	B	
Approach Delay (s)		17.9			14.9			28.7			18.7	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	75.9	Sum of lost time (s)	8.2
Intersection Capacity Utilization	74.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



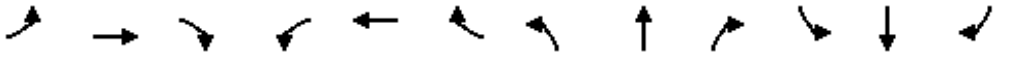
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	77	1986	149	29	1035	147	248	181	103	5	678	302
v/c Ratio	0.48	1.16	0.23	0.19	0.69	0.23	1.39	0.19	0.12	0.01	0.70	0.34
Control Delay	40.5	119.7	16.8	61.0	62.8	22.2	235.3	20.1	2.5	18.4	32.3	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.5	119.7	16.8	61.0	62.8	22.2	235.3	20.1	2.5	18.4	32.3	8.0
Queue Length 50th (m)	15.2	~309.3	14.0	6.2	101.7	12.0	~97.7	28.2	0.0	0.7	149.1	15.1
Queue Length 95th (m)	27.2	#341.5	30.9	m10.6	123.7	m24.5	#153.2	42.4	7.3	3.1	195.3	34.2
Internal Link Dist (m)		948.2			653.2			218.8			343.3	
Turn Bay Length (m)	85.0		85.0	85.0		85.0	85.0		85.0	85.0		85.0
Base Capacity (vph)	167	1714	657	159	1499	636	179	971	863	572	971	890
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	0.46	1.16	0.23	0.18	0.69	0.23	1.39	0.19	0.12	0.01	0.70	0.34

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

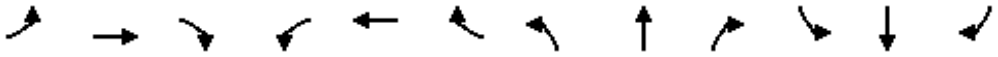
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	1986	149	29	1035	147	248	181	103	5	678	302
Future Volume (vph)	77	1986	149	29	1035	147	248	181	103	5	678	302
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.6	5.6	3.0	5.6	5.6	3.6	2.6	4.6	3.6	2.6	4.6
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1738	4520	1601	1789	4309	1555	1789	1883	1601	1789	1883	1570
Flt Permitted	0.09	1.00	1.00	0.08	1.00	1.00	0.19	1.00	1.00	0.60	1.00	1.00
Satd. Flow (perm)	162	4520	1601	155	4309	1555	353	1883	1601	1124	1883	1570
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	77	1986	149	29	1035	147	248	181	103	5	678	302
RTOR Reduction (vph)	0	0	51	0	0	96	0	0	51	0	0	101
Lane Group Flow (vph)	77	1986	98	29	1035	51	248	181	52	5	678	201
Heavy Vehicles (%)	5%	2%	2%	2%	7%	5%	2%	2%	2%	2%	2%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	53.3	53.3	53.3	53.8	50.2	50.2	75.4	75.4	75.4	75.4	75.4	75.4
Effective Green, g (s)	54.3	55.3	55.3	54.8	52.2	52.2	76.4	77.4	75.4	76.4	77.4	75.4
Actuated g/C Ratio	0.36	0.37	0.37	0.37	0.35	0.35	0.51	0.52	0.50	0.51	0.52	0.50
Clearance Time (s)	4.0	7.6	7.6	4.0	7.6	7.6	4.6	4.6	4.6	4.6	4.6	4.6
Vehicle Extension (s)	3.0	5.0	5.0	2.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Grp Cap (vph)	155	1666	590	123	1499	541	179	971	804	572	971	789
v/s Ratio Prot	0.03	c0.44		0.01	c0.24			0.10			0.36	
v/s Ratio Perm	0.15		0.06	0.08		0.03	c0.70		0.03	0.00		0.13
v/c Ratio	0.50	1.19	0.17	0.24	0.69	0.09	1.39	0.19	0.06	0.01	0.70	0.25
Uniform Delay, d1	35.2	47.4	31.9	65.2	42.0	33.0	36.8	19.4	19.2	18.1	27.5	21.3
Progression Factor	1.00	1.00	1.00	1.35	1.44	4.39	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.5	92.7	0.6	0.5	2.0	0.3	204.2	0.2	0.1	0.0	2.8	0.4
Delay (s)	37.7	140.0	32.5	88.5	62.2	144.9	241.0	19.6	19.2	18.2	30.3	21.6
Level of Service	D	F	C	F	E	F	F	B	B	B	C	C
Approach Delay (s)		129.2			72.9			122.7			27.6	
Approach LOS		F			E			F			C	

Intersection Summary			
HCM 2000 Control Delay	94.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.26		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	11.2
Intersection Capacity Utilization	108.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



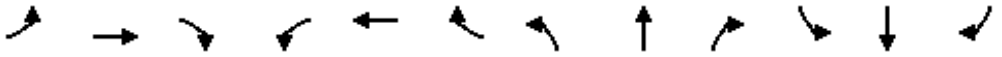
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	254	1668	166	348	1004	51	163	2302	227	110	1483	233
v/c Ratio	0.65	1.07	0.26	1.16	0.75	0.09	0.73	1.21	0.31	0.73	0.82	0.32
Control Delay	40.4	85.7	20.4	160.1	50.3	0.3	88.2	138.3	14.4	103.7	50.8	16.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.4	85.7	20.4	160.1	50.3	0.3	88.2	138.3	14.4	103.7	50.8	16.6
Queue Length 50th (m)	31.0	~219.0	19.1	~62.7	110.0	0.0	25.0	~347.2	19.8	17.1	162.2	17.7
Queue Length 95th (m)	m27.0	m107.2	m15.7	#94.5	129.2	0.0	#40.6	#377.5	39.3	#32.3	212.7	55.1
Internal Link Dist (m)		653.2			318.6			323.5			163.2	
Turn Bay Length (m)	130.0		85.0	85.0		95.0	85.0		85.0	230.0		85.0
Base Capacity (vph)	389	1554	640	300	1390	594	222	1901	742	150	1808	732
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	0.65	1.07	0.26	1.16	0.72	0.09	0.73	1.21	0.31	0.73	0.82	0.32

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

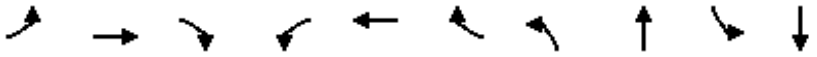
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	254	1668	166	348	1004	51	163	2302	227	110	1483	233
Future Volume (vph)	254	1668	166	348	1004	51	163	2302	227	110	1483	233
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3248	4520	1601	3471	4309	1555	3471	4520	1601	3471	4520	1555
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3248	4520	1601	3471	4309	1555	3471	4520	1601	3471	4520	1555
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	254	1668	166	348	1004	51	163	2302	227	110	1483	233
RTOR Reduction (vph)	0	0	90	0	0	35	0	0	69	0	0	110
Lane Group Flow (vph)	254	1668	76	348	1004	16	163	2302	158	110	1483	123
Heavy Vehicles (%)	9%	2%	2%	2%	7%	5%	2%	2%	2%	2%	2%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	17.0	49.6	49.6	12.0	44.6	44.6	8.6	61.1	61.1	5.5	58.0	58.0
Effective Green, g (s)	18.0	51.6	51.6	13.0	46.6	46.6	9.6	63.1	63.1	6.5	60.0	60.0
Actuated g/C Ratio	0.12	0.34	0.34	0.09	0.31	0.31	0.06	0.42	0.42	0.04	0.40	0.40
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	5.0	5.0
Lane Grp Cap (vph)	389	1554	550	300	1338	483	222	1901	673	150	1808	622
v/s Ratio Prot	0.08	c0.37		c0.10	0.23		0.05	c0.51		0.03	c0.33	
v/s Ratio Perm			0.05			0.01			0.10			0.08
v/c Ratio	0.65	1.07	0.14	1.16	0.75	0.03	0.73	1.21	0.23	0.73	0.82	0.20
Uniform Delay, d1	63.0	49.2	33.9	68.5	46.5	36.0	68.9	43.5	27.9	70.9	40.2	29.3
Progression Factor	0.62	1.12	2.45	1.00	1.00	1.00	1.00	1.00	1.00	1.12	1.16	2.12
Incremental Delay, d2	0.4	34.5	0.0	102.5	3.9	0.1	11.9	100.1	0.2	15.4	3.2	0.3
Delay (s)	39.3	89.5	83.2	171.0	50.4	36.1	80.8	143.5	28.1	95.1	49.6	62.4
Level of Service	D	F	F	F	D	D	F	F	C	F	D	E
Approach Delay (s)		82.9			79.8			130.0			54.0	
Approach LOS		F			E			F			D	

Intersection Summary			
HCM 2000 Control Delay	91.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	15.8
Intersection Capacity Utilization	105.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	232	1762	23	115	1332	104	24	232	134	30
v/c Ratio	0.62	0.67	0.02	0.44	0.61	0.12	0.08	0.53	0.98	0.08
Control Delay	20.4	17.4	0.0	16.4	19.8	4.4	26.1	23.0	106.3	13.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.4	17.4	0.0	16.4	19.8	4.4	26.1	23.0	106.3	13.6
Queue Length 50th (m)	16.8	84.8	0.0	5.1	64.2	0.0	3.4	22.6	23.2	1.4
Queue Length 95th (m)	42.4	#145.9	0.0	21.4	109.2	9.9	8.6	38.6	#46.6	7.1
Internal Link Dist (m)		318.6			344.0			313.0		312.0
Turn Bay Length (m)	85.0		85.0	85.0		85.0	85.0		85.0	
Base Capacity (vph)	376	2621	959	260	2179	854	586	796	281	745
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.67	0.02	0.44	0.61	0.12	0.04	0.29	0.48	0.04

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	232	1762	23	115	1332	104	24	108	124	134	10	20
Future Volume (vph)	232	1762	23	115	1332	104	24	108	124	134	10	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.6	5.6	3.5	5.6	5.6	3.6	2.6		3.6	2.6	
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.92		1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1789	4520	1601	1789	4350	1601	1789	1732		1789	1695	
Flt Permitted	0.10	1.00	1.00	0.09	1.00	1.00	0.74	1.00		0.35	1.00	
Satd. Flow (perm)	187	4520	1601	171	4350	1601	1389	1732		667	1695	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	232	1762	23	115	1332	104	24	108	124	134	10	20
RTOR Reduction (vph)	0	0	10	0	0	52	0	63	0	0	16	0
Lane Group Flow (vph)	232	1762	13	115	1332	52	24	169	0	134	14	0
Heavy Vehicles (%)	2%	2%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	60.3	49.3	49.3	49.6	43.1	43.1	17.5	17.5		17.5	17.5	
Effective Green, g (s)	61.3	51.3	51.3	51.6	45.1	45.1	18.5	19.5		18.5	19.5	
Actuated g/C Ratio	0.68	0.57	0.57	0.57	0.50	0.50	0.21	0.22		0.21	0.22	
Clearance Time (s)	4.5	7.6	7.6	4.5	7.6	7.6	4.6	4.6		4.6	4.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	371	2576	912	232	2179	802	285	375		137	367	
v/s Ratio Prot	c0.10	c0.39		0.04	0.31			0.10			0.01	
v/s Ratio Perm	0.33		0.01	0.24		0.03	0.02			c0.20		
v/c Ratio	0.63	0.68	0.01	0.50	0.61	0.06	0.08	0.45		0.98	0.04	
Uniform Delay, d1	14.9	13.6	8.4	11.0	16.1	11.6	28.9	30.6		35.5	27.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.3	1.5	0.0	1.7	1.3	0.2	0.1	0.9		69.4	0.0	
Delay (s)	18.2	15.1	8.4	12.6	17.4	11.7	29.0	31.5		105.0	27.9	
Level of Service	B	B	A	B	B	B	C	C		F	C	
Approach Delay (s)		15.4			16.7			31.2			90.9	
Approach LOS		B			B			C			F	

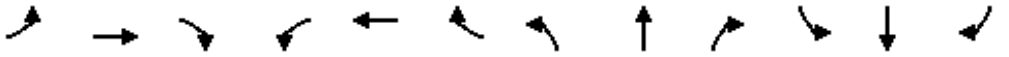
Intersection Summary			
HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.7
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	313	1703	8	47	1054	169	34	963	262	215	466
v/c Ratio	1.39	0.99	0.01	0.34	0.77	0.27	0.06	1.35	1.36	0.25	0.50
Control Delay	231.0	61.6	0.0	53.4	47.9	6.0	17.9	201.7	221.6	24.7	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	231.0	61.6	0.0	53.4	47.9	6.0	17.9	201.7	221.6	24.7	7.6
Queue Length 50th (m)	~100.3	~208.2	0.0	9.0	110.0	0.0	4.6	~348.5	~79.7	37.4	15.9
Queue Length 95th (m)	#159.7	#241.5	0.0	18.5	129.9	16.0	10.4	#428.3	#135.1	55.8	43.8
Internal Link Dist (m)		344.0			620.6			300.4		386.3	
Turn Bay Length (m)	125.0		85.0	135.0		85.0	122.0				85.0
Base Capacity (vph)	225	1726	688	137	1370	620	560	712	193	849	941
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.39	0.99	0.01	0.34	0.77	0.27	0.06	1.35	1.36	0.25	0.50

Intersection Summary

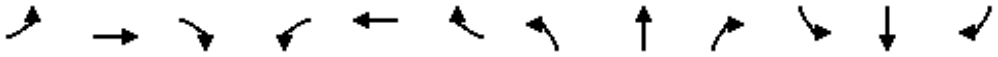
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	313	1703	8	47	1054	169	34	738	225	262	215	466
Future Volume (vph)	313	1703	8	47	1054	169	34	738	225	262	215	466
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	3.3		3.0	3.3	3.3
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1674	4520	1585	1789	4350	1601	1789	1739		1789	1830	1601
Flt Permitted	0.11	1.00	1.00	0.10	1.00	1.00	0.62	1.00		0.07	1.00	1.00
Satd. Flow (perm)	195	4520	1585	193	4350	1601	1171	1739		125	1830	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	313	1703	8	47	1054	169	34	738	225	262	215	466
RTOR Reduction (vph)	0	0	5	0	0	118	0	8	0	0	0	198
Lane Group Flow (vph)	313	1703	3	47	1054	51	34	955	0	262	215	268
Heavy Vehicles (%)	9%	2%	3%	2%	6%	2%	2%	8%	2%	2%	5%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	49.1	49.1	49.1	43.4	40.5	40.5	59.6	56.3		70.3	63.0	63.0
Effective Green, g (s)	50.1	51.1	51.1	44.4	42.5	42.5	61.6	58.3		71.3	65.0	65.0
Actuated g/C Ratio	0.36	0.37	0.37	0.32	0.30	0.30	0.44	0.42		0.51	0.46	0.46
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	6.9	4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0		3.0	5.0	5.0
Lane Grp Cap (vph)	217	1649	578	122	1320	486	534	724		194	849	743
v/s Ratio Prot	c0.14	0.38		0.01	c0.24		0.00	0.55		c0.11	0.12	
v/s Ratio Perm	c0.37		0.00	0.11		0.03	0.03			c0.58		0.17
v/c Ratio	1.44	1.03	0.01	0.39	0.80	0.11	0.06	1.32		1.35	0.25	0.36
Uniform Delay, d1	39.7	44.5	28.3	62.0	44.8	35.1	22.4	40.9		43.4	22.8	24.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	223.2	31.1	0.0	2.0	5.1	0.4	0.1	153.5		187.8	0.3	0.6
Delay (s)	262.9	75.5	28.3	64.0	49.9	35.5	22.4	194.3		231.1	23.1	24.8
Level of Service	F	E	C	E	D	D	C	F		F	C	C
Approach Delay (s)		104.3			48.5			188.4			81.7	
Approach LOS		F			D			F			F	

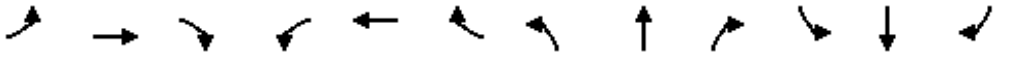
Intersection Summary			
HCM 2000 Control Delay	102.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.36		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.2
Intersection Capacity Utilization	119.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	213	1985	10	37	1112	425	34	293	257	244	214	112
v/c Ratio	0.58	0.79	0.01	0.21	0.56	0.45	0.36	0.72	0.55	0.93	0.42	0.20
Control Delay	39.1	27.4	0.0	22.7	27.0	5.3	68.3	55.4	17.1	97.0	40.2	0.8
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	39.1	27.4	0.0	22.7	27.0	5.3	68.3	55.4	17.1	97.0	40.2	0.8
Queue Length 50th (m)	26.3	167.3	0.0	4.8	81.1	5.5	8.2	67.5	15.0	31.2	45.5	0.0
Queue Length 95th (m)	48.7	#243.9	0.0	12.3	109.8	29.1	19.1	89.9	37.6	#55.8	63.1	0.0
Internal Link Dist (m)		620.6			722.4			257.9			305.8	
Turn Bay Length (m)	85.0		85.0	85.0		85.0	120.0		85.0			85.0
Base Capacity (vph)	365	2502	928	179	1992	941	94	587	604	263	631	659
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	0.58	0.79	0.01	0.21	0.56	0.45	0.36	0.50	0.43	0.93	0.34	0.17

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	213	1985	10	37	1112	425	34	293	257	244	214	112
Future Volume (vph)	213	1985	10	37	1112	425	34	293	257	244	214	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.6	5.6	3.5	5.6	5.6	3.5	2.9	4.9	3.5	2.9	2.9
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	4520	1601	1789	4350	1601	1789	1883	1601	3471	1883	1601
Flt Permitted	0.17	1.00	1.00	0.09	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	313	4520	1601	160	4350	1601	1789	1883	1601	3471	1883	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	213	1985	10	37	1112	425	34	293	257	244	214	112
RTOR Reduction (vph)	0	0	5	0	0	219	0	0	145	0	0	82
Lane Group Flow (vph)	213	1985	5	37	1112	206	34	293	112	244	214	30
Heavy Vehicles (%)	2%	2%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	66.7	63.6	63.6	51.6	51.6	51.6	3.4	26.8	26.8	8.5	31.9	31.9
Effective Green, g (s)	67.7	65.6	65.6	52.6	53.6	53.6	4.4	28.8	26.8	9.5	33.9	33.9
Actuated g/C Ratio	0.54	0.52	0.52	0.42	0.43	0.43	0.04	0.23	0.21	0.08	0.27	0.27
Clearance Time (s)	4.5	7.6	7.6	4.5	7.6	7.6	4.5	4.9	4.9	4.5	4.9	4.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	377	2372	840	140	1865	686	62	433	343	263	510	434
v/s Ratio Prot	0.08	c0.44		0.01	c0.26		0.02	c0.16		c0.07	0.11	
v/s Ratio Perm	0.23		0.00	0.10		0.13			0.07			0.02
v/c Ratio	0.56	0.84	0.01	0.26	0.60	0.30	0.55	0.68	0.33	0.93	0.42	0.07
Uniform Delay, d1	29.7	25.2	14.2	29.0	27.4	23.4	59.3	43.9	41.5	57.4	37.5	33.8
Progression 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
Incremental Delay, d2	1.9	3.7	0.0	1.0	1.4	1.1	9.6	4.2	0.6	36.2	0.6	0.1
Delay (s)	31.7	28.9	14.2	30.0	28.8	24.5	68.9	48.0	42.0	93.7	38.0	33.9
Level of Service	C	C	B	C	C	C	E	D	D	F	D	C
Approach Delay (s)		29.1			27.7			46.6			61.0	
Approach LOS		C			C			D			E	

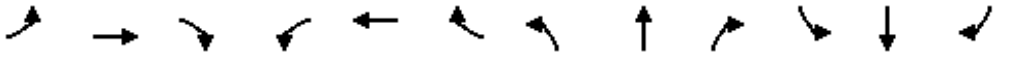
Intersection Summary			
HCM 2000 Control Delay	34.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	104	2412	5	152	1456	520	112	501	417	330	20
v/c Ratio	0.58	1.01	0.01	1.10	0.65	0.52	0.75	0.67	1.09	0.41	0.04
Control Delay	34.2	55.8	0.0	157.2	29.0	9.5	95.9	57.5	133.8	50.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.2	55.8	0.0	157.2	29.0	9.5	95.9	57.5	133.8	50.1	0.1
Queue Length 50th (m)	14.5	~303.2	0.0	~36.5	130.7	28.6	33.0	71.1	~71.8	44.4	0.0
Queue Length 95th (m)	#34.7	#368.2	0.0	#84.7	159.7	63.6	#61.2	85.5	#105.8	56.0	0.0
Internal Link Dist (m)		722.4			1030.1			436.1		413.0	
Turn Bay Length (m)	85.0		85.0	85.0		85.0	85.0		85.0		85.0
Base Capacity (vph)	179	2389	831	138	2225	997	155	918	381	957	534
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	1.01	0.01	1.10	0.65	0.52	0.72	0.55	1.09	0.34	0.04

Intersection Summary

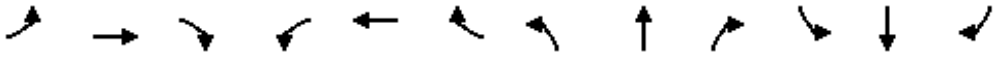
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	104	2412	5	152	1456	520	112	429	72	417	330	20
Future Volume (vph)	104	2412	5	152	1456	520	112	429	72	417	330	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.6	5.6	3.0	5.6	5.6	3.5	2.6		3.5	2.6	4.6
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	0.95		0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1789	4520	1484	1706	4309	1601	1690	3501		3471	3444	1601
Flt Permitted	0.07	1.00	1.00	0.06	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	129	4520	1484	100	4309	1601	1690	3501		3471	3444	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	104	2412	5	152	1456	520	112	429	72	417	330	20
RTOR Reduction (vph)	0	0	2	0	0	171	0	9	0	0	0	16
Lane Group Flow (vph)	104	2412	3	152	1456	349	112	492	0	417	330	4
Heavy Vehicles (%)	2%	2%	10%	7%	7%	2%	8%	2%	2%	2%	6%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6						4
Actuated Green, G (s)	77.3	77.3	77.3	79.1	75.5	75.5	12.2	29.5		15.5	32.8	32.8
Effective Green, g (s)	78.3	79.3	79.3	80.1	77.5	77.5	13.2	31.5		16.5	34.8	32.8
Actuated g/C Ratio	0.52	0.53	0.53	0.53	0.52	0.52	0.09	0.21		0.11	0.23	0.22
Clearance Time (s)	4.0	7.6	7.6	4.0	7.6	7.6	4.5	4.6		4.5	4.6	4.6
Vehicle Extension (s)	2.5	5.0	5.0	2.5	5.0	5.0	3.0	5.0		3.0	5.0	5.0
Lane Grp Cap (vph)	175	2389	784	139	2226	827	148	735		381	799	350
v/s Ratio Prot	0.04	c0.53		c0.06	0.34		0.07	c0.14		c0.12	c0.10	
v/s Ratio Perm	0.27		0.00	c0.53		0.22						0.00
v/c Ratio	0.59	1.01	0.00	1.09	0.65	0.42	0.76	0.67		1.09	0.41	0.01
Uniform Delay, d1	24.7	35.4	16.7	67.0	26.5	22.4	66.8	54.5		66.8	48.9	45.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.5	20.8	0.0	103.6	1.5	1.6	19.6	3.1		74.0	0.7	0.0
Delay (s)	29.2	56.1	16.7	170.6	28.0	24.0	86.4	57.5		140.7	49.7	45.9
Level of Service	C	E	B	F	C	C	F	E		F	D	D
Approach Delay (s)		55.0			37.2			62.8			99.1	
Approach LOS		D			D			E			F	

Intersection Summary			
HCM 2000 Control Delay	55.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	14.7
Intersection Capacity Utilization	95.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

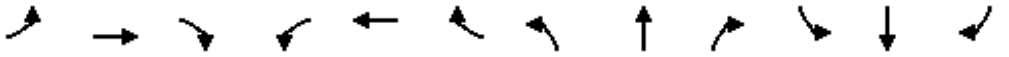


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	288	2409	345	256	1492	253	531	1712	505	624	1946	148
v/c Ratio	0.89	1.35	0.50	1.19	0.97	0.40	1.71	1.19	0.83	1.81	1.31	0.25
Control Delay	92.4	198.7	21.2	178.0	61.9	14.5	371.1	133.6	46.2	409.9	183.0	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	92.4	198.7	21.2	178.0	61.9	14.5	371.1	133.6	46.2	409.9	183.0	9.9
Queue Length 50th (m)	42.8	~376.9	42.5	~45.5	174.8	18.3	~115.3	~245.7	105.5	~138.5	~298.4	5.4
Queue Length 95th (m)	#68.1	#406.9	71.3	#73.7	#212.2	41.8	#151.2	#279.0	#157.9	#175.9	#330.9	21.3
Internal Link Dist (m)		309.3			173.0			421.7			476.7	
Turn Bay Length (m)	50.0		70.0	90.0		70.0	165.0		70.0	140.0		70.0
Base Capacity (vph)	324	1779	694	215	1545	635	310	1443	611	345	1486	581
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	0.89	1.35	0.50	1.19	0.97	0.40	1.71	1.19	0.83	1.81	1.31	0.25

Intersection Summary

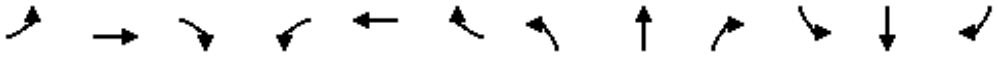
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	288	2409	345	256	1492	253	531	1712	505	624	1946	148
Future Volume (vph)	288	2409	345	256	1492	253	531	1712	505	624	1946	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3219	4520	1541	3471	4350	1498	3219	4350	1601	3340	4391	1484
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3219	4520	1541	3471	4350	1498	3219	4350	1601	3340	4391	1484
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	288	2409	345	256	1492	253	531	1712	505	624	1946	148
RTOR Reduction (vph)	0	0	87	0	0	103	0	0	81	0	0	79
Lane Group Flow (vph)	288	2409	258	256	1492	150	531	1712	424	624	1946	69
Heavy Vehicles (%)	10%	2%	6%	2%	6%	9%	10%	6%	2%	6%	5%	10%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	13.6	55.1	55.1	8.0	49.5	49.5	13.0	46.1	46.1	14.0	47.1	47.1
Effective Green, g (s)	14.6	57.1	57.1	9.0	51.5	51.5	14.0	48.1	48.1	15.0	49.1	49.1
Actuated g/C Ratio	0.10	0.39	0.39	0.06	0.36	0.36	0.10	0.33	0.33	0.10	0.34	0.34
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	324	1779	606	215	1545	532	310	1443	531	345	1486	502
v/s Ratio Prot	c0.09	c0.53		c0.07	0.34		0.16	0.39		c0.19	c0.44	
v/s Ratio Perm			0.17			0.10			0.26			0.05
v/c Ratio	0.89	1.35	0.43	1.19	0.97	0.28	1.71	1.19	0.80	1.81	1.31	0.14
Uniform Delay, d1	64.4	44.0	32.0	68.0	45.9	33.5	65.5	48.5	44.0	65.0	48.0	33.3
Progression 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
Incremental Delay, d2	24.2	163.1	0.7	122.4	15.5	0.4	334.2	91.2	11.9	375.2	144.2	0.6
Delay (s)	88.6	207.1	32.7	190.4	61.3	33.9	399.7	139.6	55.9	440.2	192.2	33.8
Level of Service	F	F	C	F	E	C	F	F	E	F	F	C
Approach Delay (s)		176.1			74.4			174.5			240.5	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	173.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.38		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	15.8
Intersection Capacity Utilization	121.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	391	1116	562	286	692	85	354	2301	228	106	1432	229
v/c Ratio	0.73	0.87	0.81	0.80	0.63	0.14	1.06	1.33	0.33	0.62	0.98	0.36
Control Delay	66.1	51.5	36.6	80.8	46.7	0.5	127.1	187.0	16.9	83.3	66.6	12.3
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	66.1	51.5	36.6	80.8	46.7	0.5	127.1	187.0	16.9	83.3	66.6	12.3
Queue Length 50th (m)	55.8	153.3	98.4	42.0	88.3	0.0	~57.5	~360.5	21.8	15.7	~181.2	12.1
Queue Length 95th (m)	70.4	181.8	147.9	#62.1	115.2	0.0	#89.1	#391.3	43.2	#28.6	#215.0	33.8
Internal Link Dist (m)		214.6			322.8			284.8			465.5	
Turn Bay Length (m)	85.0		140.0	85.0		85.0	85.0		85.0	85.0		85.0
Base Capacity (vph)	711	1330	716	361	1092	608	333	1736	686	172	1465	632
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	0.55	0.84	0.78	0.79	0.63	0.14	1.06	1.33	0.33	0.62	0.98	0.36

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.
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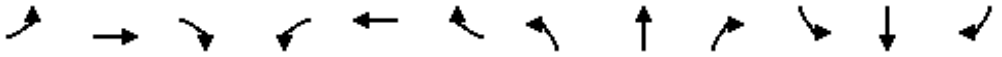
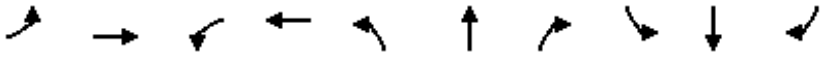


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	391	1116	562	286	692	85	354	2301	228	106	1432	229
Future Volume (vph)	391	1116	562	286	692	85	354	2301	228	106	1432	229
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.2	4.2	3.0	4.2	4.2	3.0	4.9	4.9	3.0	4.9	4.9
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3437	3579	1601	3471	3579	1601	3219	4520	1601	3471	4433	1570
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3437	3579	1601	3471	3579	1601	3219	4520	1601	3471	4433	1570
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	391	1116	562	286	692	85	354	2301	228	106	1432	229
RTOR Reduction (vph)	0	0	124	0	0	59	0	0	71	0	0	114
Lane Group Flow (vph)	391	1116	438	286	692	26	354	2301	157	106	1432	115
Heavy Vehicles (%)	3%	2%	2%	2%	2%	2%	10%	2%	2%	2%	4%	4%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	21.7	50.1	50.1	13.9	42.3	42.3	14.0	53.7	53.7	6.2	45.9	45.9
Effective Green, g (s)	22.7	52.1	52.1	14.9	44.3	44.3	15.0	55.7	55.7	7.2	47.9	47.9
Actuated g/C Ratio	0.16	0.36	0.36	0.10	0.31	0.31	0.10	0.38	0.38	0.05	0.33	0.33
Clearance Time (s)	4.0	6.2	6.2	4.0	6.2	6.2	4.0	6.9	6.9	4.0	6.9	6.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	538	1285	575	356	1093	489	333	1736	615	172	1464	518
v/s Ratio Prot	c0.11	c0.31		c0.08	0.19		0.11	c0.51		0.03	c0.32	
v/s Ratio Perm			0.27			0.02			0.10			0.07
v/c Ratio	0.73	0.87	0.76	0.80	0.63	0.05	1.06	1.33	0.26	0.62	0.98	0.22
Uniform Delay, d1	58.2	43.3	41.0	63.6	43.4	35.5	65.0	44.6	30.5	67.5	48.0	35.1
Progression 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
Incremental Delay, d2	4.9	6.5	5.9	12.3	1.2	0.0	67.0	150.6	1.0	6.4	18.9	1.0
Delay (s)	63.1	49.7	46.9	75.9	44.6	35.6	132.0	195.2	31.5	74.0	66.9	36.1
Level of Service	E	D	D	E	D	D	F	F	C	E	E	D
Approach Delay (s)		51.5			52.3			174.5			63.3	
Approach LOS		D			D			F			E	

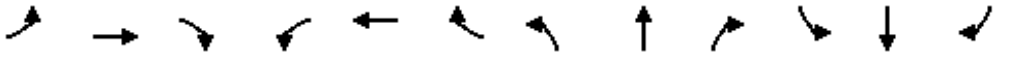
Intersection Summary			
HCM 2000 Control Delay	99.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	15.1
Intersection Capacity Utilization	101.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	5	10	5	222	5	2665	2	285	1995	5
v/c Ratio	0.10	0.05	0.04	0.75	0.03	0.97	0.00	0.67	0.53	0.00
Control Delay	61.2	40.0	56.6	38.2	5.0	22.7	0.0	48.4	5.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.2	40.0	56.6	38.2	5.0	22.7	0.0	48.4	5.8	0.0
Queue Length 50th (m)	1.4	1.4	1.4	22.5	0.1	73.9	0.0	61.5	55.3	0.0
Queue Length 95th (m)	5.6	6.9	5.4	48.7	m0.6	#391.1	m0.0	95.3	131.7	0.0
Internal Link Dist (m)		202.1		261.1		423.7			314.4	
Turn Bay Length (m)	85.0		85.0		85.0		85.0	85.0		85.0
Base Capacity (vph)	129	456	358	524	162	2748	1003	426	3736	1331
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.02	0.01	0.42	0.03	0.97	0.00	0.67	0.53	0.00

Intersection Summary

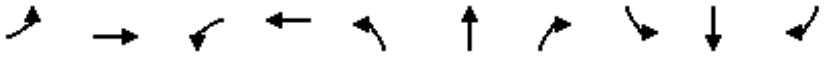
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	5	5	5	5	217	5	2665	2	285	1995	5
Future Volume (vph)	5	5	5	5	5	217	5	2665	2	285	1995	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.6	2.6		3.6	2.6		3.5	5.6	5.6	3.5	5.6	5.6
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	0.93		1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	1742		1789	1607		1789	4520	1601	1789	4520	1601
Flt Permitted	0.27	1.00		0.75	1.00		0.07	1.00	1.00	0.04	1.00	1.00
Satd. Flow (perm)	513	1742		1415	1607		133	4520	1601	80	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	5	5	5	5	217	5	2665	2	285	1995	5
RTOR Reduction (vph)	0	4	0	0	129	0	0	0	1	0	0	1
Lane Group Flow (vph)	5	6	0	5	93	0	5	2665	1	285	1995	4
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	13.7	13.7		13.7	13.7		90.5	89.3	89.3	124.1	118.4	118.4
Effective Green, g (s)	14.7	15.7		14.7	15.7		92.5	91.3	91.3	125.1	120.4	120.4
Actuated g/C Ratio	0.10	0.10		0.10	0.10		0.62	0.61	0.61	0.83	0.80	0.80
Clearance Time (s)	4.6	4.6		4.6	4.6		4.5	7.6	7.6	4.5	7.6	7.6
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	50	182		138	168		106	2751	974	423	3628	1285
v/s Ratio Prot		0.00			c0.06		0.00	c0.59		c0.14	0.44	
v/s Ratio Perm	0.01			0.00			0.03		0.00	0.42		0.00
v/c Ratio	0.10	0.03		0.04	0.55		0.05	0.97	0.00	0.67	0.55	0.00
Uniform Delay, d1	61.6	60.3		61.2	63.8		11.5	28.0	11.5	47.6	5.2	2.9
Progression Factor	1.00	1.00		1.00	1.00		0.87	0.48	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.9	0.1		0.1	3.9		0.1	7.3	0.0	4.2	0.6	0.0
Delay (s)	62.5	60.4		61.3	67.7		10.1	20.8	11.5	51.8	5.8	2.9
Level of Service	E	E		E	E		B	C	B	D	A	A
Approach Delay (s)		61.1			67.6			20.8			11.6	
Approach LOS		E			E			C			B	

Intersection Summary			
HCM 2000 Control Delay	18.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	11.7
Intersection Capacity Utilization	92.3%	ICU Level of Service	F
Analysis Period (min)	15		

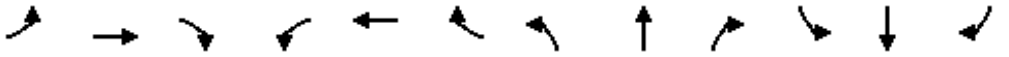
c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	5	10	67	171	5	2501	98	242	1758	5
v/c Ratio	0.10	0.06	0.52	0.64	0.03	0.85	0.09	0.67	0.47	0.00
Control Delay	64.2	42.3	78.6	31.1	7.8	45.9	9.7	68.6	3.4	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.2	42.3	78.6	31.1	7.8	45.9	9.7	68.6	3.4	0.0
Queue Length 50th (m)	1.4	1.4	19.4	13.5	0.4	316.6	9.3	60.2	38.8	0.0
Queue Length 95th (m)	5.8	7.2	34.5	36.7	m0.5	m272.6	m10.3	91.2	41.7	m0.0
Internal Link Dist (m)		170.5		265.7		219.0			423.7	
Turn Bay Length (m)	85.0		85.0		85.0		85.0	85.0		85.0
Base Capacity (vph)	140	456	358	509	197	2949	1071	359	3770	1343
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.02	0.19	0.34	0.03	0.85	0.09	0.67	0.47	0.00

Intersection Summary

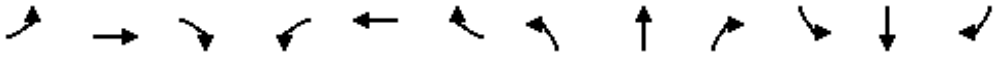
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	5	5	67	5	166	5	2501	98	242	1758	5
Future Volume (vph)	5	5	5	67	5	166	5	2501	98	242	1758	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.6	2.6		3.6	2.6		3.5	5.6	5.6	3.5	5.6	5.6
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	0.93		1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	1742		1789	1609		1789	4520	1601	1789	4520	1601
Flt Permitted	0.29	1.00		0.75	1.00		0.09	1.00	1.00	0.04	1.00	1.00
Satd. Flow (perm)	554	1742		1415	1609		178	4520	1601	75	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	5	5	67	5	166	5	2501	98	242	1758	5
RTOR Reduction (vph)	0	5	0	0	111	0	0	0	27	0	0	1
Lane Group Flow (vph)	5	5	0	67	60	0	5	2501	71	242	1758	4
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	12.6	12.6		12.6	12.6		97.0	95.9	95.9	125.2	119.6	119.6
Effective Green, g (s)	13.6	14.6		13.6	14.6		99.0	97.9	97.9	126.2	121.6	121.6
Actuated g/C Ratio	0.09	0.10		0.09	0.10		0.66	0.65	0.65	0.84	0.81	0.81
Clearance Time (s)	4.6	4.6		4.6	4.6		4.5	7.6	7.6	4.5	7.6	7.6
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	50	169		128	156		140	2950	1044	357	3664	1297
v/s Ratio Prot		0.00			0.04		0.00	c0.55		c0.12	0.39	
v/s Ratio Perm	0.01			c0.05			0.02		0.04	0.45		0.00
v/c Ratio	0.10	0.03		0.52	0.38		0.04	0.85	0.07	0.68	0.48	0.00
Uniform Delay, d1	62.6	61.3		65.1	63.5		8.9	20.3	9.5	47.8	4.4	2.7
Progression Factor	1.00	1.00		1.00	1.00		1.83	2.15	2.69	1.48	0.74	1.00
Incremental Delay, d2	0.9	0.1		3.8	1.6		0.0	0.3	0.0	4.3	0.4	0.0
Delay (s)	63.5	61.4		68.9	65.1		16.3	43.8	25.5	75.2	3.6	2.7
Level of Service	E	E		E	E		B	D	C	E	A	A
Approach Delay (s)		62.1			66.2			43.0			12.3	
Approach LOS		E			E			D			B	

Intersection Summary			
HCM 2000 Control Delay	31.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	11.7
Intersection Capacity Utilization	83.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

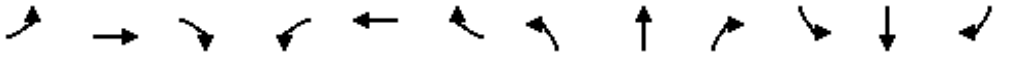


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	314	313	104	258	30	34	41	2343	399	53	1840	62
v/c Ratio	0.78	0.77	0.25	1.26	0.08	0.09	0.28	0.92	0.39	0.35	0.72	0.07
Control Delay	58.0	63.5	8.4	190.0	40.5	0.4	15.7	35.8	7.9	18.8	25.8	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.0	63.5	8.4	190.0	40.5	0.4	15.7	35.8	7.9	18.8	25.8	1.9
Queue Length 50th (m)	73.1	82.0	0.0	~59.0	6.6	0.0	3.9	247.0	19.1	5.1	156.4	0.0
Queue Length 95th (m)	94.9	107.2	13.7	#99.2	14.1	0.0	9.8	#321.5	45.5	13.6	198.4	4.4
Internal Link Dist (m)		189.2			233.6			642.4			323.5	
Turn Bay Length (m)	85.0		85.0	85.0		85.0	85.0		85.0	85.0		85.0
Base Capacity (vph)	402	524	501	204	535	509	147	2551	1015	150	2559	942
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	0.78	0.60	0.21	1.26	0.06	0.07	0.28	0.92	0.39	0.35	0.72	0.07

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

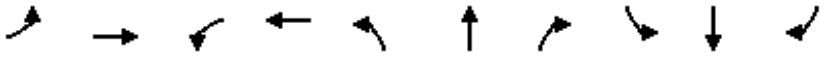
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	314	313	104	258	30	34	41	2343	399	53	1840	62
Future Volume (vph)	314	313	104	258	30	34	41	2343	399	53	1840	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	2.6	4.6	3.5	2.6	4.6	3.5	5.6	5.6	3.5	5.6	5.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	1883	1601	1789	1883	1601	1789	4520	1601	1789	4520	1601
Flt Permitted	0.65	1.00	1.00	0.22	1.00	1.00	0.05	1.00	1.00	0.05	1.00	1.00
Satd. Flow (perm)	1225	1883	1601	417	1883	1601	99	4520	1601	99	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	314	313	104	258	30	34	41	2343	399	53	1840	62
RTOR Reduction (vph)	0	0	82	0	0	28	0	0	115	0	0	28
Lane Group Flow (vph)	314	313	22	258	30	6	41	2343	284	53	1840	34
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	42.6	29.4	29.4	34.0	25.1	25.1	80.3	75.2	75.2	80.7	75.4	75.4
Effective Green, g (s)	43.8	31.4	29.4	36.0	27.1	25.1	82.3	77.2	77.2	82.7	77.4	77.4
Actuated g/C Ratio	0.31	0.22	0.21	0.26	0.19	0.18	0.59	0.55	0.55	0.59	0.55	0.55
Clearance Time (s)	4.5	4.6	4.6	4.5	4.6	4.6	4.5	7.6	7.6	4.5	7.6	7.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	440	422	336	204	364	287	131	2492	882	134	2498	885
v/s Ratio Prot	c0.07	0.17		c0.09	0.02		0.01	c0.52		c0.02	0.41	
v/s Ratio Perm	0.15		0.01	c0.24		0.00	0.17		0.18	0.22		0.02
v/c Ratio	0.71	0.74	0.07	1.26	0.08	0.02	0.31	0.94	0.32	0.40	0.74	0.04
Uniform Delay, d1	41.3	50.5	44.3	48.8	46.3	47.3	19.5	29.3	17.1	30.0	23.6	14.3
Progression 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
Incremental Delay, d2	5.4	6.9	0.1	152.1	0.1	0.0	1.4	8.6	1.0	1.9	2.0	0.1
Delay (s)	46.8	57.4	44.4	200.9	46.4	47.4	20.9	37.9	18.1	32.0	25.6	14.4
Level of Service	D	E	D	F	D	D	C	D	B	C	C	B
Approach Delay (s)		51.0			170.3			34.8			25.4	
Approach LOS		D			F			C			C	

Intersection Summary			
HCM 2000 Control Delay	41.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.2
Intersection Capacity Utilization	87.4%	ICU Level of Service	E
Analysis Period (min)	15		

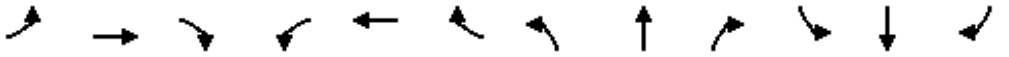
c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	191	361	10	167	153	2470	6	148	1989	44
v/c Ratio	0.89	0.78	0.15	0.36	0.71	0.91	0.01	0.86	0.76	0.05
Control Delay	82.5	42.2	41.3	18.0	43.3	28.6	0.0	65.8	23.0	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.5	42.2	41.3	18.0	43.3	28.6	0.0	65.8	23.0	3.4
Queue Length 50th (m)	43.7	58.6	1.9	13.3	18.7	204.5	0.0	18.9	144.7	0.0
Queue Length 95th (m)	#76.7	92.9	6.8	31.4	#52.5	#301.2	0.0	#63.2	198.5	4.8
Internal Link Dist (m)		265.1		307.9		467.3			642.4	
Turn Bay Length (m)	85.0		85.0		85.0		85.0	85.0		85.0
Base Capacity (vph)	294	594	89	600	227	2716	982	173	2613	947
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.61	0.11	0.28	0.67	0.91	0.01	0.86	0.76	0.05

Intersection Summary

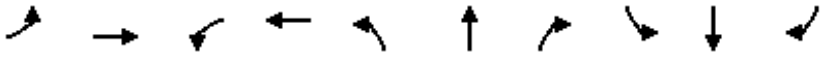
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	191	21	340	10	27	140	153	2470	6	148	1989	44
Future Volume (vph)	191	21	340	10	27	140	153	2470	6	148	1989	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.6	2.6		3.6	2.6		3.5	5.6	5.6	3.5	5.6	5.6
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	0.86		1.00	0.87		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	1617		1789	1647		1789	4520	1601	1789	4520	1601
Flt Permitted	0.49	1.00		0.15	1.00		0.06	1.00	1.00	0.06	1.00	1.00
Satd. Flow (perm)	931	1617		280	1647		106	4520	1601	110	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	191	21	340	10	27	140	153	2470	6	148	1989	44
RTOR Reduction (vph)	0	76	0	0	73	0	0	0	2	0	0	19
Lane Group Flow (vph)	191	285	0	10	94	0	153	2470	4	148	1989	25
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	26.9	26.9		26.9	26.9		79.4	70.3	70.3	73.8	67.5	67.5
Effective Green, g (s)	27.9	28.9		27.9	28.9		81.4	72.3	72.3	75.8	69.5	69.5
Actuated g/C Ratio	0.23	0.24		0.23	0.24		0.68	0.60	0.60	0.63	0.58	0.58
Clearance Time (s)	4.6	4.6		4.6	4.6		4.5	7.6	7.6	4.5	7.6	7.6
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	216	388		64	395		213	2718	962	171	2613	925
v/s Ratio Prot		0.18			0.06		c0.06	c0.55		c0.05	0.44	
v/s Ratio Perm	c0.21			0.04			0.43		0.00	0.49		0.02
v/c Ratio	0.88	0.73		0.16	0.24		0.72	0.91	0.00	0.87	0.76	0.03
Uniform Delay, d1	44.6	42.1		36.8	36.8		29.7	21.1	9.6	32.9	19.1	10.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	31.9	7.1		1.1	0.3		11.0	5.8	0.0	33.7	2.2	0.1
Delay (s)	76.5	49.2		37.9	37.1		40.6	26.8	9.6	66.7	21.3	10.9
Level of Service	E	D		D	D		D	C	A	E	C	B
Approach Delay (s)		58.6			37.1			27.6			24.1	
Approach LOS		E			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	120.2	Sum of lost time (s)	11.7
Intersection Capacity Utilization	96.9%	ICU Level of Service	F
Analysis Period (min)	15		

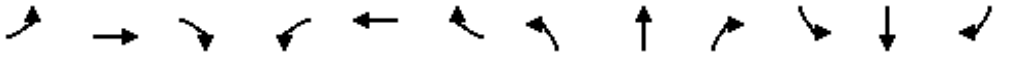
c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	275	179	179	98	188	2259	63	125	2199	14
v/c Ratio	0.82	0.34	0.67	0.19	0.89	0.93	0.07	0.66	0.93	0.02
Control Delay	52.9	13.8	44.6	6.4	61.4	31.0	4.4	32.8	31.6	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.9	13.8	44.6	6.4	61.4	31.0	4.4	32.8	31.6	0.0
Queue Length 50th (m)	49.3	11.3	30.6	0.4	19.6	160.6	0.3	8.2	157.1	0.0
Queue Length 95th (m)	78.9	27.3	53.3	11.1	#69.0	#250.0	7.1	#38.2	#243.9	0.0
Internal Link Dist (m)		318.3		354.6		485.6			467.3	
Turn Bay Length (m)	85.0		85.0		85.0		85.0	85.0		85.0
Base Capacity (vph)	473	694	375	690	211	2429	888	188	2370	868
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.26	0.48	0.14	0.89	0.93	0.07	0.66	0.93	0.02

Intersection Summary

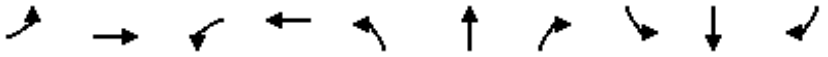
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	275	6	173	179	3	95	188	2259	63	125	2199	14
Future Volume (vph)	275	6	173	179	3	95	188	2259	63	125	2199	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.6	2.6		3.6	2.6		3.5	5.6	5.6	3.5	5.6	5.6
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	0.86		1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	1610		1789	1610		1789	4520	1601	1789	4520	1601
Flt Permitted	0.66	1.00		0.52	1.00		0.08	1.00	1.00	0.08	1.00	1.00
Satd. Flow (perm)	1234	1610		979	1610		143	4520	1601	147	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	275	6	173	179	3	95	188	2259	63	125	2199	14
RTOR Reduction (vph)	0	72	0	0	68	0	0	0	28	0	0	7
Lane Group Flow (vph)	275	107	0	179	30	0	188	2259	35	125	2199	7
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	26.3	26.3		26.3	26.3		57.9	51.6	51.6	55.3	50.3	50.3
Effective Green, g (s)	27.3	28.3		27.3	28.3		59.9	53.6	53.6	57.3	52.3	52.3
Actuated g/C Ratio	0.27	0.28		0.27	0.28		0.60	0.54	0.54	0.58	0.53	0.53
Clearance Time (s)	4.6	4.6		4.6	4.6		4.5	7.6	7.6	4.5	7.6	7.6
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	338	457		268	457		206	2432	861	183	2373	840
v/s Ratio Prot		0.07			0.02		c0.07	c0.50		0.04	0.49	
v/s Ratio Perm	c0.22			0.18			0.48		0.02	0.35		0.00
v/c Ratio	0.81	0.23		0.67	0.07		0.91	0.93	0.04	0.68	0.93	0.01
Uniform Delay, d1	33.8	27.3		32.1	26.0		26.8	21.2	10.9	20.6	21.9	11.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	13.9	0.3		6.2	0.1		39.1	7.8	0.1	10.1	7.8	0.0
Delay (s)	47.7	27.6		38.3	26.1		66.0	29.0	11.0	30.6	29.6	11.3
Level of Service	D	C		D	C		E	C	B	C	C	B
Approach Delay (s)		39.7			34.0			31.3			29.6	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	99.6	Sum of lost time (s)	11.7
Intersection Capacity Utilization	88.8%	ICU Level of Service	E
Analysis Period (min)	15		

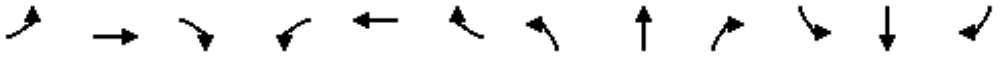
c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	5	370	46	51	102	2438	8	13	2565	5
v/c Ratio	0.02	0.83	0.74	0.12	0.68	0.82	0.01	0.09	0.93	0.01
Control Delay	33.6	50.2	101.2	11.5	42.0	20.9	0.0	8.3	30.3	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.6	50.2	101.2	11.5	42.0	20.9	0.0	8.3	30.3	0.0
Queue Length 50th (m)	0.9	68.0	10.1	0.9	8.0	151.9	0.0	0.9	219.8	0.0
Queue Length 95th (m)	4.1	103.9	#30.0	10.4	#38.7	#275.5	0.0	3.4	#316.8	0.0
Internal Link Dist (m)		271.9		333.5		436.2			485.6	
Turn Bay Length (m)	85.0		85.0		85.0		85.0	85.0		85.0
Base Capacity (vph)	427	568	83	558	150	2971	1069	151	2749	993
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.65	0.55	0.09	0.68	0.82	0.01	0.09	0.93	0.01

Intersection Summary

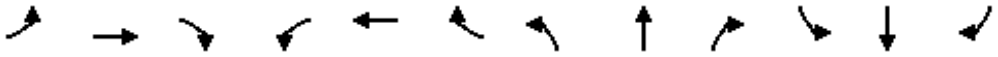
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	5	365	46	5	46	102	2438	8	13	2565	5
Future Volume (vph)	5	5	365	46	5	46	102	2438	8	13	2565	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.6	2.6		3.6	2.6		3.5	5.6	5.6	3.5	5.6	5.6
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	0.85		1.00	0.86		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	1605		1789	1629		1789	4520	1601	1789	4520	1601
Flt Permitted	0.72	1.00		0.14	1.00		0.05	1.00	1.00	0.05	1.00	1.00
Satd. Flow (perm)	1356	1605		263	1629		96	4520	1601	100	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	5	365	46	5	46	102	2438	8	13	2565	5
RTOR Reduction (vph)	0	56	0	0	35	0	0	0	3	0	0	2
Lane Group Flow (vph)	5	314	0	46	16	0	102	2438	5	13	2565	3
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	27.6	27.6		27.6	27.6		82.5	77.5	77.5	76.3	74.4	74.4
Effective Green, g (s)	28.6	29.6		28.6	29.6		84.5	79.5	79.5	78.3	76.4	76.4
Actuated g/C Ratio	0.23	0.24		0.23	0.24		0.68	0.64	0.64	0.63	0.62	0.62
Clearance Time (s)	4.6	4.6		4.6	4.6		4.5	7.6	7.6	4.5	7.6	7.6
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	313	384		60	389		147	2904	1028	102	2791	988
v/s Ratio Prot		c0.20			0.01		c0.03	0.54		0.00	c0.57	
v/s Ratio Perm	0.00			0.17			0.44		0.00	0.08		0.00
v/c Ratio	0.02	0.82		0.77	0.04		0.69	0.84	0.01	0.13	0.92	0.00
Uniform Delay, d1	36.7	44.5		44.4	36.1		29.5	17.2	7.9	18.4	20.9	9.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	12.8		43.5	0.0		13.3	3.1	0.0	0.6	6.2	0.0
Delay (s)	36.7	57.3		87.9	36.2		42.8	20.3	7.9	19.0	27.2	9.1
Level of Service	D	E		F	D		D	C	A	B	C	A
Approach Delay (s)		57.0			60.7			21.1			27.1	
Approach LOS		E			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	123.7	Sum of lost time (s)	11.7
Intersection Capacity Utilization	96.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

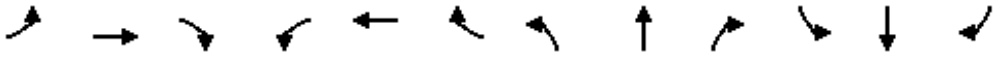


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	123	74	647	133	3	149	46	2277	75	148	2781	48
v/c Ratio	0.26	0.12	1.15	0.31	0.00	0.26	0.37	0.96	0.09	0.92	1.10	0.05
Control Delay	38.9	35.1	127.4	40.2	33.3	21.1	20.6	45.5	7.6	86.8	84.6	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.9	35.1	127.4	40.2	33.3	21.1	20.6	45.5	7.6	86.8	84.6	5.0
Queue Length 50th (m)	26.9	15.2	~211.6	29.6	0.6	17.0	5.1	263.5	3.7	28.1	~397.5	0.5
Queue Length 95th (m)	44.1	27.4	#286.6	48.1	3.0	34.8	10.6	#299.6	11.9	#70.8	#424.2	6.8
Internal Link Dist (m)		291.2			376.2			390.5			436.2	
Turn Bay Length (m)	85.0		85.0	85.0		85.0	85.0		85.0	85.0		85.0
Base Capacity (vph)	468	632	562	424	632	563	123	2371	863	161	2524	914
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	0.26	0.12	1.15	0.31	0.00	0.26	0.37	0.96	0.09	0.92	1.10	0.05

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

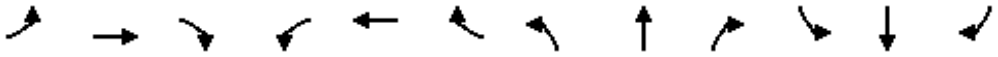
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	123	74	647	133	3	149	46	2277	75	148	2781	48
Future Volume (vph)	123	74	647	133	3	149	46	2277	75	148	2781	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.6	2.6	4.6	3.6	2.6	4.6	3.5	5.6	5.6	3.5	5.6	5.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	1883	1601	1789	1883	1601	1789	4520	1601	1789	4520	1601
Flt Permitted	0.76	1.00	1.00	0.68	1.00	1.00	0.05	1.00	1.00	0.05	1.00	1.00
Satd. Flow (perm)	1424	1883	1601	1289	1883	1601	96	4520	1601	92	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	123	74	647	133	3	149	46	2277	75	148	2781	48
RTOR Reduction (vph)	0	0	46	0	0	47	0	0	23	0	0	20
Lane Group Flow (vph)	123	74	601	133	3	102	46	2277	52	148	2781	28
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	48.4	48.4	48.4	48.4	48.4	48.4	81.6	77.6	77.6	90.0	81.8	81.8
Effective Green, g (s)	49.4	50.4	48.4	49.4	50.4	48.4	83.6	79.6	79.6	91.3	83.8	83.8
Actuated g/C Ratio	0.33	0.33	0.32	0.33	0.33	0.32	0.55	0.53	0.53	0.61	0.56	0.56
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.5	7.6	7.6	4.5	7.6	7.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	466	628	513	421	628	513	109	2384	844	159	2510	889
v/s Ratio Prot		0.04			0.00		0.01	0.50		c0.06	c0.62	
v/s Ratio Perm	0.09		c0.38	0.10		0.06	0.22		0.03	0.51		0.02
v/c Ratio	0.26	0.12	1.17	0.32	0.00	0.20	0.42	0.96	0.06	0.93	1.11	0.03
Uniform Delay, d1	37.4	34.8	51.2	38.1	33.5	37.2	34.3	33.9	17.4	48.1	33.6	15.2
Progression 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
Incremental Delay, d2	0.3	0.1	96.2	0.4	0.0	0.2	2.6	10.6	0.1	51.2	55.1	0.1
Delay (s)	37.7	34.9	147.5	38.5	33.5	37.4	36.9	44.5	17.5	99.3	88.6	15.3
Level of Service	D	C	F	D	C	D	D	D	B	F	F	B
Approach Delay (s)		121.6			37.9			43.5			88.0	
Approach LOS		F			D			D			F	

Intersection Summary			
HCM 2000 Control Delay	73.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	150.9	Sum of lost time (s)	11.7
Intersection Capacity Utilization	113.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

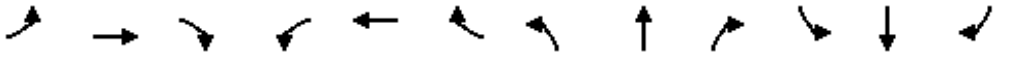


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	48	2509	349	250	1377	749	459	1770	1218	218	1060	114
v/c Ratio	0.24	1.35	0.46	0.82	0.69	0.80	1.71	1.28	1.60	1.08	0.82	0.22
Control Delay	63.7	193.7	17.5	81.7	31.8	30.2	369.1	169.2	304.5	145.6	50.6	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.7	193.7	17.5	81.7	31.8	30.2	369.1	169.2	304.5	145.6	50.6	7.1
Queue Length 50th (m)	6.3	~363.8	35.7	34.3	123.0	147.8	~92.4	~248.3	~456.7	~33.4	109.7	0.0
Queue Length 95th (m)	12.9	#394.5	62.5	#55.1	143.1	210.0	#126.1	#281.5	#538.1	#59.3	130.2	14.0
Internal Link Dist (m)		1711.9			759.7			657.0			690.8	
Turn Bay Length (m)	130.0		110.0	300.0		70.0	110.0		70.0	130.0		85.0
Base Capacity (vph)	201	1861	751	305	1991	931	269	1385	760	201	1288	519
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	0.24	1.35	0.46	0.82	0.69	0.80	1.71	1.28	1.60	1.08	0.82	0.22

Intersection Summary

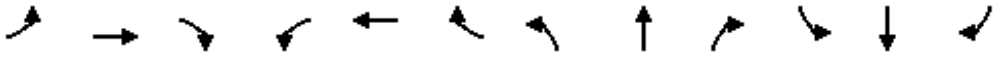
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	2509	349	250	1377	749	459	1770	1218	218	1060	114
Future Volume (vph)	48	2509	349	250	1377	749	459	1770	1218	218	1060	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.4	5.4	3.0	5.4	2.0	3.0	5.0	2.0	3.0	5.0	5.0
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3404	4520	1601	3437	4350	1601	3309	4350	1601	3404	4350	1484
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3404	4520	1601	3437	4350	1601	3309	4350	1601	3404	4350	1484
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	48	2509	349	250	1377	749	459	1770	1218	218	1060	114
RTOR Reduction (vph)	0	0	92	0	0	31	0	0	40	0	0	80
Lane Group Flow (vph)	48	2509	257	250	1377	718	459	1770	1178	218	1060	34
Heavy Vehicles (%)	4%	2%	2%	3%	6%	2%	7%	6%	2%	4%	6%	10%
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6	7	3	8	1	7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	5.6	53.6	53.6	11.0	59.0	66.0	10.0	41.0	52.0	7.0	38.0	38.0
Effective Green, g (s)	6.6	55.6	55.6	12.0	61.0	70.0	11.0	43.0	56.0	8.0	40.0	40.0
Actuated g/C Ratio	0.05	0.41	0.41	0.09	0.45	0.52	0.08	0.32	0.41	0.06	0.30	0.30
Clearance Time (s)	4.0	7.4	7.4	4.0	7.4	4.0	4.0	7.0	4.0	4.0	7.0	7.0
Vehicle Extension (s)	5.0	3.0	3.0	5.0	3.0	4.0	4.0	5.0	5.0	4.0	5.0	5.0
Lane Grp Cap (vph)	166	1861	659	305	1965	830	269	1385	664	201	1288	439
v/s Ratio Prot	0.01	c0.56		0.07	0.32	0.06	c0.14	0.41	c0.17	0.06	0.24	
v/s Ratio Perm			0.16			0.39			0.57			0.02
v/c Ratio	0.29	1.35	0.39	0.82	0.70	0.86	1.71	1.28	1.77	1.08	0.82	0.08
Uniform Delay, d1	61.9	39.7	27.8	60.4	29.7	28.4	62.0	46.0	39.5	63.5	44.2	34.2
Progression 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
Incremental Delay, d2	2.0	160.3	1.7	17.5	2.1	9.6	333.3	130.8	354.6	87.8	6.0	0.3
Delay (s)	64.0	200.0	29.6	77.9	31.8	38.0	395.3	176.8	394.1	151.3	50.2	34.5
Level of Service	E	F	C	E	C	D	F	F	F	F	D	C
Approach Delay (s)		177.3			38.6			282.7			64.8	
Approach LOS		F			D			F			E	

Intersection Summary			
HCM 2000 Control Delay	165.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.58		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	141.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

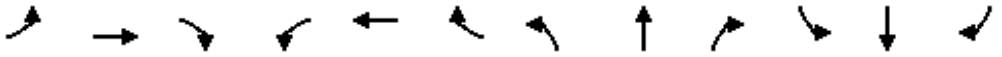


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	137	272	386	373	47	77	82	1846	253	344	2737	140
v/c Ratio	0.32	0.32	0.88	1.20	0.05	0.18	0.62	0.93	0.32	1.06	1.10	0.16
Control Delay	39.4	46.6	57.9	159.4	41.4	1.5	44.1	48.5	12.6	109.6	84.5	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.4	46.6	57.9	159.4	41.4	1.5	44.1	48.5	12.6	109.6	84.5	8.1
Queue Length 50th (m)	29.2	34.3	76.5	~110.7	5.5	0.0	9.1	219.9	19.9	~98.8	~393.8	8.6
Queue Length 95th (m)	46.4	47.4	#126.9	#192.7	10.8	1.6	#30.5	#260.1	40.4	#161.3	#421.0	19.5
Internal Link Dist (m)		1074.9			770.5			396.6			272.1	
Turn Bay Length (m)	85.0		85.0	120.0		85.0	170.0		70.0	170.0		70.0
Base Capacity (vph)	422	958	481	310	974	480	132	1979	793	325	2482	865
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	0.32	0.28	0.80	1.20	0.05	0.16	0.62	0.93	0.32	1.06	1.10	0.16

Intersection Summary

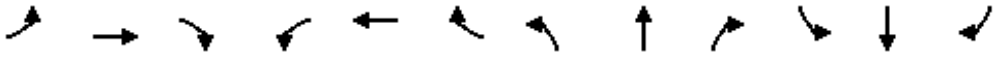
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	137	272	386	373	47	77	82	1846	253	344	2737	140
Future Volume (vph)	137	272	386	373	47	77	82	1846	253	344	2737	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.5	3.2	5.2	3.0	3.2	5.2	3.0	5.8	5.8	3.0	5.8	5.8
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	3579	1526	1789	3544	1484	1755	4433	1601	1722	4433	1484
Flt Permitted	0.72	1.00	1.00	0.46	1.00	1.00	0.06	1.00	1.00	0.06	1.00	1.00
Satd. Flow (perm)	1365	3579	1526	865	3544	1484	115	4433	1601	108	4433	1484
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	137	272	386	373	47	77	82	1846	253	344	2737	140
RTOR Reduction (vph)	0	0	98	0	0	59	0	0	79	0	0	34
Lane Group Flow (vph)	137	272	288	373	47	18	82	1846	174	344	2737	106
Heavy Vehicles (%)	2%	2%	7%	2%	3%	10%	4%	4%	2%	6%	4%	10%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	8		3	4		5	2		1	6	
Permitted Phases	8		8	4		4	2		2	6		6
Actuated Green, G (s)	38.1	32.6	32.6	40.6	33.6	33.6	68.6	63.1	63.1	89.1	79.6	79.6
Effective Green, g (s)	42.1	34.6	32.6	42.6	35.6	33.6	70.6	65.1	65.1	90.1	81.6	81.6
Actuated g/C Ratio	0.29	0.24	0.22	0.29	0.24	0.23	0.48	0.45	0.45	0.62	0.56	0.56
Clearance Time (s)	4.5	5.2	5.2	4.0	5.2	5.2	4.0	7.8	7.8	4.0	7.8	7.8
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	416	849	341	303	865	342	128	1980	715	321	2482	831
v/s Ratio Prot	0.02	0.08		c0.07	0.01		0.03	0.42		c0.17	c0.62	
v/s Ratio Perm	0.08		0.19	c0.29		0.01	0.28		0.11	0.49		0.07
v/c Ratio	0.33	0.32	0.85	1.23	0.05	0.05	0.64	0.93	0.24	1.07	1.10	0.13
Uniform Delay, d1	39.9	45.8	54.1	51.1	42.2	43.6	33.3	38.2	25.0	50.2	32.0	15.2
Progression 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
Incremental Delay, d2	0.5	0.5	18.8	129.4	0.1	0.1	10.5	9.5	0.8	70.6	53.0	0.3
Delay (s)	40.4	46.3	72.9	180.5	42.2	43.8	43.7	47.7	25.8	120.7	85.1	15.5
Level of Service	D	D	E	F	D	D	D	D	C	F	F	B
Approach Delay (s)		58.2			146.2			45.1			85.9	
Approach LOS		E			F			D			F	

Intersection Summary			
HCM 2000 Control Delay	73.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	145.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	109.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

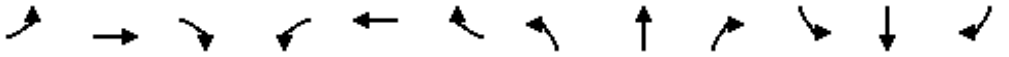


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	303	1225	279	664	1453	326	245	1607	631	296	988	341
v/c Ratio	0.93	0.94	0.48	1.08	0.87	0.47	0.77	1.07	0.87	1.05	0.69	0.51
Control Delay	94.9	60.9	17.5	110.1	46.5	16.8	76.8	88.2	37.3	125.6	42.6	15.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.9	60.9	17.5	110.1	46.5	16.8	76.8	88.2	37.3	125.6	42.6	15.5
Queue Length 50th (m)	42.0	133.0	21.8	~101.3	149.2	29.2	33.4	~197.7	96.4	~44.0	95.2	24.4
Queue Length 95th (m)	#69.2	#165.3	48.4	#138.7	172.5	55.8	#51.4	#231.4	#167.6	#73.1	113.7	53.4
Internal Link Dist (m)		239.5			177.4			308.0			325.9	
Turn Bay Length (m)	142.0		89.0	147.0		118.0	120.0		132.0	120.0		115.0
Base Capacity (vph)	326	1305	585	617	1667	700	318	1498	722	282	1440	668
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	0.93	0.94	0.48	1.08	0.87	0.47	0.77	1.07	0.87	1.05	0.69	0.51

Intersection Summary

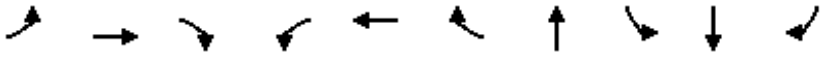
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	303	1225	279	664	1453	326	245	1607	631	296	988	341
Future Volume (vph)	303	1225	279	664	1453	326	245	1607	631	296	988	341
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3340	4520	1601	3471	4520	1601	3471	4476	1601	3471	4433	1601
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3340	4520	1601	3471	4520	1601	3471	4476	1601	3471	4433	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	303	1225	279	664	1453	326	245	1607	631	296	988	341
RTOR Reduction (vph)	0	0	123	0	0	110	0	0	187	0	0	148
Lane Group Flow (vph)	303	1225	156	664	1453	216	245	1607	444	296	988	193
Heavy Vehicles (%)	6%	2%	2%	2%	2%	2%	2%	3%	2%	2%	4%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	12.2	37.0	37.0	23.0	47.8	47.8	11.3	43.2	43.2	10.0	41.9	41.9
Effective Green, g (s)	13.2	39.0	39.0	24.0	49.8	49.8	12.3	45.2	45.2	11.0	43.9	43.9
Actuated g/C Ratio	0.10	0.29	0.29	0.18	0.37	0.37	0.09	0.33	0.33	0.08	0.33	0.33
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	3.2	3.2	3.0	3.2	3.2
Lane Grp Cap (vph)	326	1305	462	617	1667	590	316	1498	536	282	1441	520
v/s Ratio Prot	0.09	c0.27		c0.19	0.32		0.07	c0.36		c0.09	0.22	
v/s Ratio Perm			0.10			0.14			0.28			0.12
v/c Ratio	0.93	0.94	0.34	1.08	0.87	0.37	0.78	1.07	0.83	1.05	0.69	0.37
Uniform Delay, d1	60.4	46.8	37.8	55.5	39.6	31.1	60.0	44.9	41.3	62.0	39.6	35.0
Progression 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
Incremental Delay, d2	31.7	13.0	0.6	58.4	5.5	0.5	11.3	45.5	10.3	67.2	1.4	0.5
Delay (s)	92.2	59.8	38.4	113.9	45.1	31.6	71.3	90.4	51.6	129.2	40.9	35.4
Level of Service	F	E	D	F	D	C	E	F	D	F	D	D
Approach Delay (s)		61.9			62.0			78.7			55.9	
Approach LOS		E			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	65.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	15.8
Intersection Capacity Utilization	96.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	286	1762	120	7	2315	137	351	214	86	93
v/c Ratio	1.09	0.61	0.11	0.05	0.98	0.16	0.93	0.71	0.16	0.19
Control Delay	122.0	16.6	2.1	9.1	49.3	7.4	81.3	61.4	39.8	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	122.0	16.6	2.1	9.1	49.3	7.4	81.3	61.4	39.8	7.9
Queue Length 50th (m)	~76.6	113.0	0.0	0.6	268.2	6.7	96.3	55.2	18.5	0.0
Queue Length 95th (m)	#135.2	155.2	8.2	2.3	#315.6	17.8	#155.4	86.1	32.5	13.1
Internal Link Dist (m)		1174.8			389.4		298.2		317.5	
Turn Bay Length (m)	130.0		85.0	85.0		85.0		85.0		85.0
Base Capacity (vph)	263	2892	1077	155	2351	875	388	311	545	509
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.09	0.61	0.11	0.05	0.98	0.16	0.90	0.69	0.16	0.18

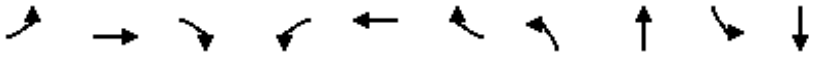
Intersection Summary

~ 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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	286	1762	120	7	2315	137	213	87	51	214	86	93
Future Volume (vph)	286	1762	120	7	2315	137	213	87	51	214	86	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.6	5.6	3.0	5.6	5.6		3.0		4.0	3.0	5.0
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (prot)	1789	4476	1601	1789	4520	1601		1792		1789	1883	1601
Flt Permitted	0.05	1.00	1.00	0.07	1.00	1.00		0.72		0.58	1.00	1.00
Satd. Flow (perm)	94	4476	1601	139	4520	1601		1330		1101	1883	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	286	1762	120	7	2315	137	213	87	51	214	86	93
RTOR Reduction (vph)	0	0	44	0	0	42	0	4	0	0	0	69
Lane Group Flow (vph)	286	1762	76	7	2315	95	0	347	0	214	86	24
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	96.0	90.9	90.9	77.1	76.0	76.0		38.4		38.4	38.4	38.4
Effective Green, g (s)	97.0	92.9	92.9	79.1	78.0	78.0		40.4		39.4	40.4	38.4
Actuated g/C Ratio	0.66	0.63	0.63	0.54	0.53	0.53		0.27		0.27	0.27	0.26
Clearance Time (s)	4.0	7.6	7.6	4.0	7.6	7.6		5.0		5.0	5.0	5.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0		5.0		5.0	5.0	5.0
Lane Grp Cap (vph)	258	2828	1011	98	2398	849		365		295	517	418
v/s Ratio Prot	c0.13	0.39		0.00	0.51						0.05	
v/s Ratio Perm	c0.60		0.05	0.04		0.06		c0.26		0.19		0.02
v/c Ratio	1.11	0.62	0.08	0.07	0.97	0.11		0.95		0.73	0.17	0.06
Uniform Delay, d1	53.0	16.4	10.5	16.7	33.2	17.2		52.3		48.9	40.5	40.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	88.3	1.0	0.1	0.3	11.9	0.3		34.6		10.4	0.3	0.1
Delay (s)	141.2	17.5	10.6	17.0	45.1	17.5		86.9		59.3	40.8	40.9
Level of Service	F	B	B	B	D	B		F		E	D	D
Approach Delay (s)		33.4			43.5			86.9			50.9	
Approach LOS		C			D			F			D	

Intersection Summary			
HCM 2000 Control Delay	42.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	147.0	Sum of lost time (s)	11.6
Intersection Capacity Utilization	98.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



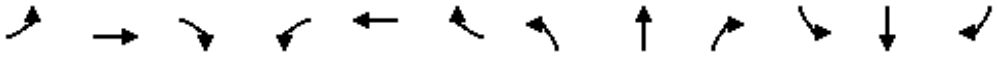
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	5	1689	303	24	2043	202	416	31	114	10
v/c Ratio	0.02	0.74	0.31	0.12	0.85	0.22	0.85	0.05	0.24	0.02
Control Delay	11.0	22.2	3.1	11.8	24.8	4.2	44.4	8.8	22.3	14.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.0	22.2	3.1	11.8	24.8	4.2	44.4	8.8	22.3	14.6
Queue Length 50th (m)	0.4	82.0	0.0	1.7	112.9	2.0	60.5	0.5	12.8	0.5
Queue Length 95th (m)	2.2	152.5	14.8	5.9	#222.7	16.0	#110.8	6.4	27.8	3.8
Internal Link Dist (m)		389.4			948.2			362.8		565.8
Turn Bay Length (m)	85.0		85.0	85.0		85.0	85.0		85.0	
Base Capacity (vph)	201	2293	968	200	2397	931	652	792	640	826
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.74	0.31	0.12	0.85	0.22	0.64	0.04	0.18	0.01

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1689	303	24	2043	202	416	5	26	114	5	5
Future Volume (vph)	5	1689	303	24	2043	202	416	5	26	114	5	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.6	5.6	3.5	5.6	5.6	3.6	2.6		3.6	2.6	
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1789	4476	1601	1789	4520	1601	1789	1646		1789	1742	
Flt Permitted	0.09	1.00	1.00	0.09	1.00	1.00	0.75	1.00		0.74	1.00	
Satd. Flow (perm)	163	4476	1601	161	4520	1601	1415	1646		1388	1742	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	1689	303	24	2043	202	416	5	26	114	5	5
RTOR Reduction (vph)	0	0	151	0	0	86	0	17	0	0	3	0
Lane Group Flow (vph)	5	1689	152	24	2043	116	416	14	0	114	7	0
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	46.0	45.1	45.1	47.6	45.9	45.9	30.4	30.4		30.4	30.4	
Effective Green, g (s)	48.0	47.1	47.1	49.6	47.9	47.9	31.4	32.4		31.4	32.4	
Actuated g/C Ratio	0.51	0.50	0.50	0.53	0.51	0.51	0.33	0.35		0.33	0.35	
Clearance Time (s)	4.5	7.6	7.6	4.5	7.6	7.6	4.6	4.6		4.6	4.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	116	2245	803	131	2305	816	473	567		464	601	
v/s Ratio Prot	0.00	0.38		c0.01	c0.45			0.01			0.00	
v/s Ratio Perm	0.02		0.09	0.09		0.07	c0.29			0.08		
v/c Ratio	0.04	0.75	0.19	0.18	0.89	0.14	0.88	0.02		0.25	0.01	
Uniform Delay, d1	17.8	18.7	12.9	14.2	20.6	12.2	29.5	20.3		22.7	20.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	2.4	0.5	0.7	5.5	0.4	16.8	0.0		0.3	0.0	
Delay (s)	17.9	21.1	13.4	14.9	26.1	12.5	46.3	20.3		22.9	20.2	
Level of Service	B	C	B	B	C	B	D	C		C	C	
Approach Delay (s)		19.9			24.7			44.5			22.7	
Approach LOS		B			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	24.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	93.9	Sum of lost time (s)	11.7
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

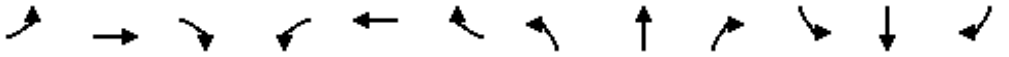


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	359	1314	173	25	1980	179	159	160	105	5	663	129
v/c Ratio	1.22	0.59	0.20	0.12	1.09	0.25	1.20	0.23	0.15	0.01	1.11	0.22
Control Delay	160.5	27.2	3.5	29.1	89.0	11.3	173.5	31.8	1.2	27.0	114.9	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	160.5	27.2	3.5	29.1	89.0	11.3	173.5	31.8	1.2	27.0	114.9	3.1
Queue Length 50th (m)	~106.6	113.5	0.0	4.0	~256.0	11.1	~38.6	29.4	0.0	0.9	~209.3	0.0
Queue Length 95th (m)	#168.3	131.5	12.6	9.9	#288.5	27.3	#86.5	51.5	1.9	3.8	#282.3	8.1
Internal Link Dist (m)		948.2			653.2			218.8			343.3	
Turn Bay Length (m)	85.0		85.0	85.0		85.0	85.0		85.0	85.0		85.0
Base Capacity (vph)	294	2213	885	215	1820	713	132	705	680	448	597	597
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	1.22	0.59	0.20	0.12	1.09	0.25	1.20	0.23	0.15	0.01	1.11	0.22

Intersection Summary

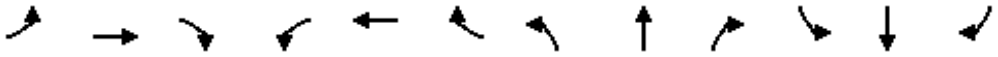
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	359	1314	173	25	1980	179	159	160	105	5	663	129
Future Volume (vph)	359	1314	173	25	1980	179	159	160	105	5	663	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.6	5.6	3.0	5.6	5.6	3.5	2.6	4.6	3.5	2.6	4.6
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	4433	1601	1789	4520	1601	1789	1883	1601	1789	1883	1601
Flt Permitted	0.09	1.00	1.00	0.14	1.00	1.00	0.08	1.00	1.00	0.64	1.00	1.00
Satd. Flow (perm)	165	4433	1601	268	4520	1601	149	1883	1601	1197	1883	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	359	1314	173	25	1980	179	159	160	105	5	663	129
RTOR Reduction (vph)	0	0	93	0	0	71	0	0	67	0	0	87
Lane Group Flow (vph)	359	1314	80	25	1980	108	159	160	38	5	663	42
Heavy Vehicles (%)	2%	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	62.7	62.7	62.7	54.4	50.8	50.8	56.0	50.5	50.5	47.0	46.0	46.0
Effective Green, g (s)	63.7	64.7	64.7	55.4	52.8	52.8	57.0	52.5	50.5	49.0	48.0	46.0
Actuated g/C Ratio	0.46	0.46	0.46	0.40	0.38	0.38	0.41	0.38	0.36	0.35	0.34	0.33
Clearance Time (s)	4.0	7.6	7.6	4.0	7.6	7.6	4.5	4.6	4.6	4.5	4.6	4.6
Vehicle Extension (s)	3.0	5.0	5.0	2.5	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	283	2048	739	172	1704	603	136	706	577	427	645	526
v/s Ratio Prot	c0.16	0.30		0.01	c0.44		c0.05	0.08		0.00	0.35	
v/s Ratio Perm	c0.41		0.05	0.05		0.07	c0.42		0.02	0.00		0.03
v/c Ratio	1.27	0.64	0.11	0.15	1.16	0.18	1.17	0.23	0.07	0.01	1.03	0.08
Uniform Delay, d1	44.4	28.8	21.3	32.1	43.6	29.1	36.4	29.9	29.3	29.7	46.0	32.4
Progression 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
Incremental Delay, d2	145.8	1.6	0.3	0.3	79.8	0.7	129.8	0.3	0.1	0.0	42.8	0.1
Delay (s)	190.1	30.3	21.6	32.4	123.4	29.8	166.1	30.2	29.4	29.7	88.8	32.6
Level of Service	F	C	C	C	F	C	F	C	C	C	F	C
Approach Delay (s)		60.6			114.7			81.0			79.3	
Approach LOS		E			F			F			E	

Intersection Summary			
HCM 2000 Control Delay	87.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.7
Intersection Capacity Utilization	116.5%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

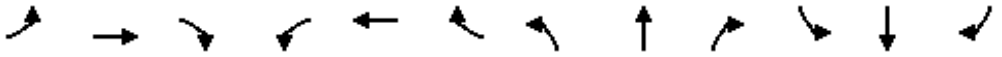


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	213	1095	112	429	1796	117	208	1946	314	78	1966	505
v/c Ratio	0.99	0.86	0.19	0.84	1.07	0.17	0.99	1.03	0.40	0.52	1.09	0.69
Control Delay	127.7	58.4	0.7	77.5	88.2	3.5	128.5	71.4	12.5	82.9	90.9	30.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	127.7	58.4	0.7	77.5	88.2	3.5	128.5	71.4	12.5	82.9	90.9	30.3
Queue Length 50th (m)	33.2	128.9	0.0	64.9	~245.8	0.0	32.4	~257.2	22.4	11.9	~272.5	86.9
Queue Length 95th (m)	#60.5	150.2	0.0	#89.1	#278.7	9.0	#59.3	#289.6	46.5	20.8	#304.6	129.1
Internal Link Dist (m)		653.2			318.6			323.5			163.2	
Turn Bay Length (m)	130.0		85.0	85.0		95.0	85.0		85.0	230.0		85.0
Base Capacity (vph)	215	1280	591	511	1678	680	210	1889	782	150	1811	736
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	0.99	0.86	0.19	0.84	1.07	0.17	0.99	1.03	0.40	0.52	1.09	0.69

Intersection Summary

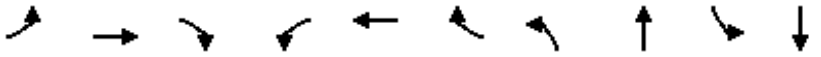
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	213	1095	112	429	1796	117	208	1946	314	78	1966	505
Future Volume (vph)	213	1095	112	429	1796	117	208	1946	314	78	1966	505
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3471	4476	1601	3471	4520	1601	3471	4520	1601	3471	4520	1601
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3471	4476	1601	3471	4520	1601	3471	4520	1601	3471	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	213	1095	112	429	1796	117	208	1946	314	78	1966	505
RTOR Reduction (vph)	0	0	80	0	0	74	0	0	113	0	0	95
Lane Group Flow (vph)	213	1095	32	429	1796	43	208	1946	201	78	1966	410
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	8.3	40.9	40.9	21.1	53.7	53.7	8.1	60.7	60.7	5.5	58.1	58.1
Effective Green, g (s)	9.3	42.9	42.9	22.1	55.7	55.7	9.1	62.7	62.7	6.5	60.1	60.1
Actuated g/C Ratio	0.06	0.29	0.29	0.15	0.37	0.37	0.06	0.42	0.42	0.04	0.40	0.40
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	5.0	5.0
Lane Grp Cap (vph)	215	1280	457	511	1678	594	210	1889	669	150	1811	641
v/s Ratio Prot	0.06	0.24		c0.12	c0.40		0.06	c0.43		0.02	c0.43	
v/s Ratio Perm			0.02			0.03			0.13			0.26
v/c Ratio	0.99	0.86	0.07	0.84	1.07	0.07	0.99	1.03	0.30	0.52	1.09	0.64
Uniform Delay, d1	70.3	50.6	39.0	62.2	47.1	30.5	70.4	43.6	29.0	70.2	45.0	36.2
Progression 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
Incremental Delay, d2	58.5	7.5	0.3	11.6	43.5	0.2	59.2	28.9	0.3	3.2	48.5	3.0
Delay (s)	128.9	58.1	39.3	73.8	90.7	30.7	129.6	72.5	29.3	73.5	93.5	39.2
Level of Service	F	E	D	E	F	C	F	E	C	E	F	D
Approach Delay (s)		67.2			84.6			71.8			82.1	
Approach LOS		E			F			E			F	

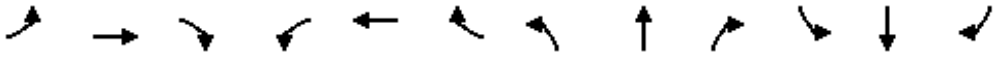
Intersection Summary			
HCM 2000 Control Delay	77.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	15.8
Intersection Capacity Utilization	99.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	303	1209	24	167	2229	25	19	134	116	102
v/c Ratio	0.74	0.40	0.02	0.51	0.88	0.03	0.12	0.37	0.89	0.31
Control Delay	49.0	11.1	0.8	12.9	33.4	0.0	49.3	13.1	110.4	21.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.0	11.1	0.8	12.9	33.4	0.0	49.3	13.1	110.4	21.5
Queue Length 50th (m)	61.3	55.0	0.0	8.8	220.2	0.0	4.6	3.3	31.9	8.4
Queue Length 95th (m)	#104.9	88.4	1.2	19.2	#292.7	0.0	11.5	20.2	51.6	23.1
Internal Link Dist (m)		318.6			344.0			313.0		312.0
Turn Bay Length (m)	85.0		85.0	85.0		85.0	85.0		85.0	
Base Capacity (vph)	412	3006	1111	378	2520	929	279	540	233	521
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.40	0.02	0.44	0.88	0.03	0.07	0.25	0.50	0.20

Intersection Summary

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



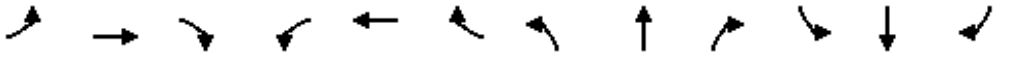
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	303	1209	24	167	2229	25	19	14	120	116	35	67
Future Volume (vph)	303	1209	24	167	2229	25	19	14	120	116	35	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.6	5.6	3.5	5.6	5.6	3.6	2.6		3.6	2.6	
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87		1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1789	4391	1601	1789	4520	1601	1789	1630		1789	1698	
Flt Permitted	0.05	1.00	1.00	0.19	1.00	1.00	0.55	1.00		0.46	1.00	
Satd. Flow (perm)	94	4391	1601	349	4520	1601	1030	1630		859	1698	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	303	1209	24	167	2229	25	19	14	120	116	35	67
RTOR Reduction (vph)	0	0	8	0	0	11	0	101	0	0	56	0
Lane Group Flow (vph)	303	1209	16	167	2229	14	19	33	0	116	46	0
Heavy Vehicles (%)	2%	5%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	107.4	93.8	93.8	85.1	76.0	76.0	20.4	20.4		20.4	20.4	
Effective Green, g (s)	108.4	95.8	95.8	87.1	78.0	78.0	21.4	22.4		21.4	22.4	
Actuated g/C Ratio	0.77	0.68	0.68	0.62	0.56	0.56	0.15	0.16		0.15	0.16	
Clearance Time (s)	4.5	7.6	7.6	4.5	7.6	7.6	4.6	4.6		4.6	4.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	410	3004	1095	321	2518	891	157	260		131	271	
v/s Ratio Prot	c0.15	0.28		0.04	c0.49			0.02			0.03	
v/s Ratio Perm	0.43		0.01	0.29		0.01	0.02			c0.14		
v/c Ratio	0.74	0.40	0.01	0.52	0.89	0.02	0.12	0.13		0.89	0.17	
Uniform Delay, d1	43.3	9.6	7.0	11.0	27.1	13.8	51.2	50.4		58.1	50.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.8	0.4	0.0	1.5	5.0	0.0	0.3	0.2		45.6	0.3	
Delay (s)	50.2	10.0	7.1	12.5	32.1	13.9	51.5	50.6		103.7	51.1	
Level of Service	D	B	A	B	C	B	D	D		F	D	
Approach Delay (s)		17.9			30.6			50.8			79.1	
Approach LOS		B			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	29.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	11.7
Intersection Capacity Utilization	89.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	174	1279	8	133	1705	182	21	484	247	367	698
v/c Ratio	0.97	0.75	0.01	0.75	0.97	0.25	0.05	0.74	0.95	0.51	0.91
Control Delay	87.7	32.0	0.0	64.8	48.9	5.3	17.5	38.4	70.9	28.5	37.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.7	32.0	0.0	64.8	48.9	5.3	17.5	38.4	70.9	28.5	37.8
Queue Length 50th (m)	24.2	96.7	0.0	18.0	147.5	2.0	2.5	88.5	33.1	54.0	89.1
Queue Length 95th (m)	#63.4	116.5	0.0	#40.8	#187.6	15.4	6.9	127.0	#77.8	93.3	#186.6
Internal Link Dist (m)		344.0			620.6			300.4		386.3	
Turn Bay Length (m)	125.0		85.0	135.0		85.0	122.0				85.0
Base Capacity (vph)	179	1712	663	178	1758	724	385	658	259	717	764
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.75	0.01	0.75	0.97	0.25	0.05	0.74	0.95	0.51	0.91

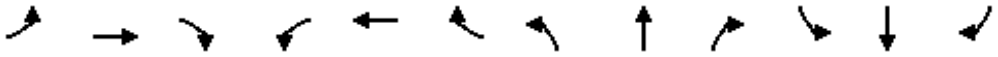
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	174	1279	8	133	1705	182	21	417	67	247	367	698
Future Volume (vph)	174	1279	8	133	1705	182	21	417	67	247	367	698
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	3.3		3.0	3.3	3.3
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1659	4350	1484	1789	4520	1601	1789	1844		1789	1746	1484
Flt Permitted	0.12	1.00	1.00	0.11	1.00	1.00	0.42	1.00		0.21	1.00	1.00
Satd. Flow (perm)	212	4350	1484	210	4520	1601	782	1844		391	1746	1484
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	174	1279	8	133	1705	182	21	417	67	247	367	698
RTOR Reduction (vph)	0	0	5	0	0	106	0	5	0	0	0	155
Lane Group Flow (vph)	174	1279	3	133	1705	76	21	479	0	247	367	543
Heavy Vehicles (%)	10%	6%	10%	2%	2%	2%	2%	2%	2%	2%	10%	10%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	38.9	38.9	38.9	41.3	38.4	38.4	41.6	39.4		49.2	43.2	43.2
Effective Green, g (s)	39.9	40.9	40.9	42.3	40.4	40.4	43.6	41.4		50.4	45.2	45.2
Actuated g/C Ratio	0.36	0.37	0.37	0.38	0.37	0.37	0.40	0.38		0.46	0.41	0.41
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	6.9	4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0		3.0	5.0	5.0
Lane Grp Cap (vph)	168	1617	551	174	1660	588	339	694		268	717	609
v/s Ratio Prot	c0.07	0.29		0.05	c0.38		0.00	0.26		c0.06	0.21	
v/s Ratio Perm	0.31		0.00	0.25		0.05	0.02			c0.36		0.37
v/c Ratio	1.04	0.79	0.01	0.76	1.03	0.13	0.06	0.69		0.92	0.51	0.89
Uniform Delay, d1	31.4	30.7	21.7	39.4	34.8	23.1	20.7	28.9		27.8	24.2	30.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	79.2	4.0	0.0	17.9	29.3	0.5	0.1	3.8		34.7	1.2	16.2
Delay (s)	110.5	34.8	21.8	57.3	64.1	23.6	20.8	32.7		62.5	25.4	46.3
Level of Service	F	C	C	E	E	C	C	C		E	C	D
Approach Delay (s)		43.7			60.0			32.2			43.5	
Approach LOS		D			E			C			D	

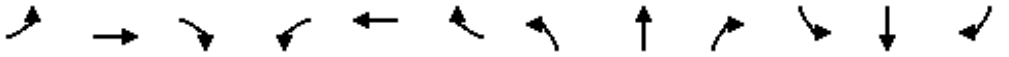
Intersection Summary			
HCM 2000 Control Delay	48.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	14.2
Intersection Capacity Utilization	96.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	161	1445	11	119	1668	416	22	248	184	408	177	315
v/c Ratio	0.93	0.72	0.01	0.51	0.74	0.43	0.26	0.69	0.40	0.95	0.32	0.52
Control Delay	98.8	30.6	0.0	27.1	28.3	5.9	65.1	56.8	4.7	86.7	35.7	17.6
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	98.8	30.6	0.0	27.1	28.3	5.9	65.1	56.8	4.7	86.7	35.7	17.6
Queue Length 50th (m)	23.6	116.7	0.0	14.7	132.0	10.0	5.3	57.4	0.0	52.0	35.3	26.4
Queue Length 95th (m)	#71.5	158.2	0.0	32.1	172.1	33.9	14.0	79.3	9.8	#82.1	51.1	50.9
Internal Link Dist (m)		620.6			722.4			257.9			305.8	
Turn Bay Length (m)	85.0		85.0	85.0		85.0	120.0		85.0			85.0
Base Capacity (vph)	173	1998	820	233	2254	967	85	587	631	430	730	734
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	0.93	0.72	0.01	0.51	0.74	0.43	0.26	0.42	0.29	0.95	0.24	0.43

Intersection Summary

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



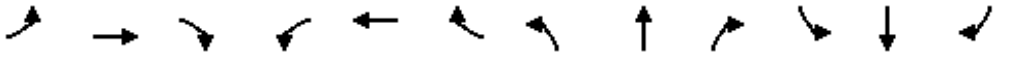
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	161	1445	11	119	1668	416	22	248	184	408	177	315
Future Volume (vph)	161	1445	11	119	1668	416	22	248	184	408	177	315
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.6	5.6	3.5	5.6	5.6	3.5	2.9	4.9	3.5	2.9	2.9
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	4269	1601	1789	4520	1601	1789	1883	1601	3471	1883	1601
Flt Permitted	0.08	1.00	1.00	0.08	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	148	4269	1601	157	4520	1601	1789	1883	1601	3471	1883	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	161	1445	11	119	1668	416	22	248	184	408	177	315
RTOR Reduction (vph)	0	0	6	0	0	174	0	0	149	0	0	130
Lane Group Flow (vph)	161	1445	5	119	1668	242	22	248	35	408	177	185
Heavy Vehicles (%)	2%	8%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	57.8	54.7	54.7	58.5	58.5	58.5	3.0	23.7	23.7	14.5	35.2	35.2
Effective Green, g (s)	58.8	56.7	56.7	59.5	60.5	60.5	4.0	25.7	23.7	15.5	37.2	37.2
Actuated g/C Ratio	0.47	0.45	0.45	0.48	0.48	0.48	0.03	0.21	0.19	0.12	0.30	0.30
Clearance Time (s)	4.5	7.6	7.6	4.5	7.6	7.6	4.5	4.9	4.9	4.5	4.9	4.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	172	1936	726	226	2187	774	57	387	303	430	560	476
v/s Ratio Prot	c0.06	0.34		0.05	c0.37		0.01	c0.13		c0.12	0.09	
v/s Ratio Perm	c0.38		0.00	0.20		0.15			0.02			0.12
v/c Ratio	0.94	0.75	0.01	0.53	0.76	0.31	0.39	0.64	0.12	0.95	0.32	0.39
Uniform Delay, d1	42.4	28.2	18.7	23.9	26.4	19.6	59.3	45.4	42.0	54.4	34.0	34.9
Progression 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
Incremental Delay, d2	49.8	2.7	0.0	2.2	2.6	1.1	4.3	3.6	0.2	30.3	0.3	0.5
Delay (s)	92.2	30.9	18.7	26.1	29.0	20.7	63.6	49.0	42.1	84.7	34.4	35.4
Level of Service	F	C	B	C	C	C	E	D	D	F	C	D
Approach Delay (s)		36.9			27.2			46.9			57.5	
Approach LOS		D			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	37.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	96	1969	9	106	2081	557	73	299	366	481	60
v/c Ratio	0.57	0.90	0.01	0.63	0.88	0.55	0.59	0.47	0.89	0.55	0.12
Control Delay	31.5	34.3	0.0	58.1	32.5	8.7	76.2	42.6	78.3	43.8	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.5	34.3	0.0	58.1	32.5	8.7	76.2	42.6	78.3	43.8	0.5
Queue Length 50th (m)	10.7	171.3	0.0	11.9	178.0	24.6	17.3	30.6	45.2	55.1	0.0
Queue Length 95th (m)	#29.3	#244.2	0.0	#37.4	#240.9	62.9	#38.8	44.1	#78.8	72.0	0.0
Internal Link Dist (m)		722.4			1030.1			436.1		413.0	
Turn Bay Length (m)	85.0		85.0	85.0		85.0	85.0		85.0		85.0
Base Capacity (vph)	168	2181	862	168	2352	1010	127	1117	410	1305	662
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.90	0.01	0.63	0.88	0.55	0.57	0.27	0.89	0.37	0.09

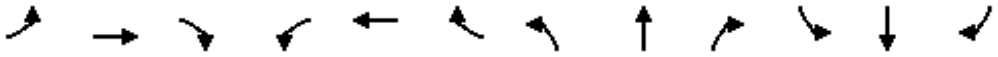
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	1969	9	106	2081	557	73	225	74	366	481	60
Future Volume (vph)	96	1969	9	106	2081	557	73	225	74	366	481	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.6	5.6	3.0	5.6	5.6	3.5	2.6		3.5	2.6	4.6
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	0.95		0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1659	4192	1526	1690	4520	1601	1772	3446		3471	3579	1601
Flt Permitted	0.07	1.00	1.00	0.07	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	127	4192	1526	122	4520	1601	1772	3446		3471	3579	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	96	1969	9	106	2081	557	73	225	74	366	481	60
RTOR Reduction (vph)	0	0	4	0	0	179	0	26	0	0	0	46
Lane Group Flow (vph)	96	1969	5	106	2081	378	73	273	0	366	481	14
Heavy Vehicles (%)	10%	10%	7%	8%	2%	2%	3%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6						4
Actuated Green, G (s)	61.9	61.9	61.9	65.5	61.9	61.9	6.2	20.6		13.5	27.9	27.9
Effective Green, g (s)	62.9	63.9	63.9	66.5	63.9	63.9	7.2	22.6		14.5	29.9	27.9
Actuated g/C Ratio	0.51	0.52	0.52	0.54	0.52	0.52	0.06	0.18		0.12	0.24	0.23
Clearance Time (s)	4.0	7.6	7.6	4.0	7.6	7.6	4.5	4.6		4.5	4.6	4.6
Vehicle Extension (s)	2.5	5.0	5.0	2.5	5.0	5.0	3.0	5.0		3.0	5.0	5.0
Lane Grp Cap (vph)	163	2165	788	166	2334	827	103	629		406	865	361
v/s Ratio Prot	0.04	c0.47		0.04	c0.46		0.04	0.08		c0.11	c0.13	
v/s Ratio Perm	0.26		0.00	0.30		0.24						0.01
v/c Ratio	0.59	0.91	0.01	0.64	0.89	0.46	0.71	0.43		0.90	0.56	0.04
Uniform Delay, d1	26.9	27.3	14.5	43.1	26.8	18.9	57.2	44.9		53.9	41.1	37.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.4	6.5	0.0	6.9	5.1	0.8	19.9	1.0		22.6	1.3	0.1
Delay (s)	31.4	33.7	14.5	50.0	31.9	19.8	77.2	45.9		76.5	42.4	37.5
Level of Service	C	C	B	D	C	B	E	D		E	D	D
Approach Delay (s)		33.6			30.1			52.0			55.8	
Approach LOS		C			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	36.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	123.7	Sum of lost time (s)	14.7
Intersection Capacity Utilization	79.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

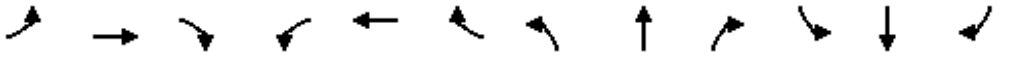


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	234	1875	504	412	2165	788	468	1653	281	331	1633	182
v/c Ratio	1.10	1.12	0.70	1.32	1.20	1.05	1.30	1.07	0.44	1.15	1.12	0.32
Control Delay	150.9	105.6	29.6	215.4	132.3	77.2	204.4	88.9	22.2	157.6	109.9	17.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	150.9	105.6	29.6	215.4	132.3	77.2	204.4	88.9	22.2	157.6	109.9	17.9
Queue Length 50th (m)	~39.0	~258.0	79.2	~78.7	~312.5	~210.1	~88.5	~218.2	33.9	~57.5	~224.8	16.8
Queue Length 95th (m)	#66.4	#290.8	122.1	#111.8	#343.7	#287.5	#123.2	#251.5	59.8	#88.5	#258.3	36.9
Internal Link Dist (m)		309.3			173.0			421.7			476.7	
Turn Bay Length (m)	50.0		70.0	90.0		70.0	165.0		70.0	140.0		70.0
Base Capacity (vph)	213	1670	715	311	1811	754	359	1546	634	287	1453	568
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	1.10	1.12	0.70	1.32	1.20	1.05	1.30	1.07	0.44	1.15	1.12	0.32

Intersection Summary

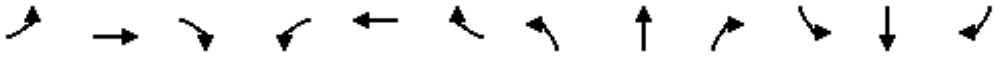
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	234	1875	504	412	2165	788	468	1653	281	331	1633	182
Future Volume (vph)	234	1875	504	412	2165	788	468	1653	281	331	1633	182
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3437	4476	1601	3471	4520	1601	3471	4476	1601	3471	4476	1541
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3437	4476	1601	3471	4520	1601	3471	4476	1601	3471	4476	1541
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	234	1875	504	412	2165	788	468	1653	281	331	1633	182
RTOR Reduction (vph)	0	0	118	0	0	113	0	0	81	0	0	68
Lane Group Flow (vph)	234	1875	386	412	2165	675	468	1653	200	331	1633	114
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%	2%	3%	2%	2%	3%	6%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	8.0	52.1	52.1	12.0	56.1	56.1	14.0	48.1	48.1	11.0	45.1	45.1
Effective Green, g (s)	9.0	54.1	54.1	13.0	58.1	58.1	15.0	50.1	50.1	12.0	47.1	47.1
Actuated g/C Ratio	0.06	0.37	0.37	0.09	0.40	0.40	0.10	0.35	0.35	0.08	0.32	0.32
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	213	1670	597	311	1811	641	359	1546	553	287	1453	500
v/s Ratio Prot	0.07	0.42		c0.12	c0.48		c0.13	c0.37		0.10	0.36	
v/s Ratio Perm			0.24			0.42			0.12			0.07
v/c Ratio	1.10	1.12	0.65	1.32	1.20	1.05	1.30	1.07	0.36	1.15	1.12	0.23
Uniform Delay, d1	68.0	45.5	37.6	66.0	43.5	43.5	65.0	47.5	35.5	66.5	49.0	35.7
Progression 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
Incremental Delay, d2	90.5	63.8	2.7	166.8	93.7	50.2	155.5	43.9	1.8	101.2	65.3	1.1
Delay (s)	158.5	109.2	40.2	232.8	137.1	93.6	220.5	91.4	37.3	167.7	114.3	36.8
Level of Service	F	F	D	F	F	F	F	F	D	F	F	D
Approach Delay (s)		100.3			138.7			110.2			115.9	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	118.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.20		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	15.8
Intersection Capacity Utilization	108.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

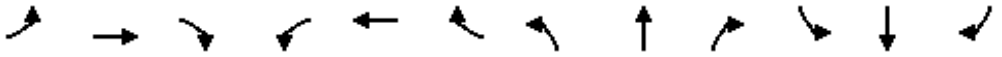


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	214	902	364	107	1472	71	338	2024	129	99	2204	229
v/c Ratio	0.54	0.55	0.45	0.52	1.03	0.10	1.77	1.34	0.21	0.64	1.50	0.37
Control Delay	65.7	30.3	17.8	75.4	74.2	0.3	403.4	194.4	8.5	86.7	264.3	16.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.7	30.3	17.8	75.4	74.2	0.3	403.4	194.4	8.5	86.7	264.3	16.7
Queue Length 50th (m)	30.5	97.8	42.2	15.6	~228.3	0.0	~74.3	~314.2	2.9	14.6	~364.7	19.2
Queue Length 95th (m)	42.9	117.8	68.7	25.8	#289.4	0.0	#105.6	#346.5	17.4	#26.1	#396.0	41.9
Internal Link Dist (m)		214.6			322.8			284.8			465.5	
Turn Bay Length (m)	85.0		140.0	85.0		85.0	85.0		85.0	85.0		85.0
Base Capacity (vph)	704	1632	806	210	1429	742	191	1514	612	155	1468	611
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	0.30	0.55	0.45	0.51	1.03	0.10	1.77	1.34	0.21	0.64	1.50	0.37

Intersection Summary

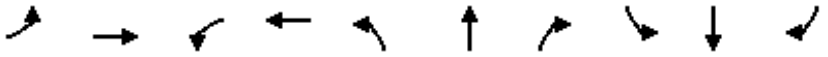
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



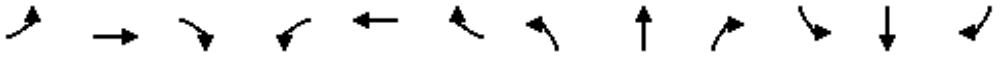
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	214	902	364	107	1472	71	338	2024	129	99	2204	229
Future Volume (vph)	214	902	364	107	1472	71	338	2024	129	99	2204	229
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.2	4.2	3.0	4.2	4.2	3.0	4.9	4.9	3.0	4.9	4.9
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3404	3579	1601	3471	3579	1601	3471	4520	1601	3471	4520	1601
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3404	3579	1601	3471	3579	1601	3471	4520	1601	3471	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	214	902	364	107	1472	71	338	2024	129	99	2204	229
RTOR Reduction (vph)	0	0	77	0	0	43	0	0	76	0	0	92
Lane Group Flow (vph)	214	902	287	107	1472	28	338	2024	53	99	2204	137
Heavy Vehicles (%)	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	15.9	64.1	64.1	7.7	55.9	55.9	7.0	46.6	46.6	5.5	45.1	45.1
Effective Green, g (s)	16.9	66.1	66.1	8.7	57.9	57.9	8.0	48.6	48.6	6.5	47.1	47.1
Actuated g/C Ratio	0.12	0.46	0.46	0.06	0.40	0.40	0.06	0.34	0.34	0.04	0.32	0.32
Clearance Time (s)	4.0	6.2	6.2	4.0	6.2	6.2	4.0	6.9	6.9	4.0	6.9	6.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	396	1631	729	208	1429	639	191	1514	536	155	1468	520
v/s Ratio Prot	c0.06	0.25		0.03	c0.41		c0.10	0.45		0.03	c0.49	
v/s Ratio Perm			0.18			0.02			0.03			0.09
v/c Ratio	0.54	0.55	0.39	0.51	1.03	0.04	1.77	1.34	0.10	0.64	1.50	0.26
Uniform Delay, d1	60.4	28.7	26.2	66.1	43.6	26.6	68.5	48.2	33.1	68.1	49.0	36.1
Progression 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
Incremental Delay, d2	1.5	0.4	0.4	2.1	31.9	0.0	366.8	156.2	0.4	8.4	229.2	1.2
Delay (s)	61.9	29.1	26.5	68.2	75.4	26.7	435.3	204.4	33.5	76.5	278.2	37.4
Level of Service	E	C	C	E	E	C	F	F	C	E	F	D
Approach Delay (s)		33.2			72.9			226.9			248.5	
Approach LOS		C			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	167.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	15.1
Intersection Capacity Utilization	119.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	5	10	5	212	5	2284	5	198	2477	5
v/c Ratio	0.05	0.06	0.03	0.73	0.04	0.75	0.00	0.65	0.67	0.00
Control Delay	54.2	41.2	53.6	35.3	5.8	20.5	0.0	48.4	8.7	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.2	41.2	53.6	35.3	5.8	20.5	0.0	48.4	8.7	0.0
Queue Length 50th (m)	1.4	1.4	1.4	18.0	0.2	166.2	0.0	38.3	77.2	0.0
Queue Length 95th (m)	5.0	7.0	5.0	43.7	1.5	286.2	0.0	67.3	241.8	0.0
Internal Link Dist (m)		202.1		261.1		423.7			314.4	
Turn Bay Length (m)	85.0		85.0		85.0		85.0	85.0		85.0
Base Capacity (vph)	104	456	153	528	132	3033	1110	306	3717	1330
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.02	0.03	0.40	0.04	0.75	0.00	0.65	0.67	0.00

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	5	5	5	5	207	5	2284	5	198	2477	5
Future Volume (vph)	5	5	5	5	5	207	5	2284	5	198	2477	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	2.6		3.5	2.6		3.5	5.6	5.6	3.5	5.6	5.6
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	0.93		1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	1742		1789	1608		1789	4520	1601	1789	4520	1601
Flt Permitted	0.30	1.00		0.75	1.00		0.04	1.00	1.00	0.04	1.00	1.00
Satd. Flow (perm)	562	1742		1415	1608		78	4520	1601	76	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	5	5	5	5	207	5	2284	5	198	2477	5
RTOR Reduction (vph)	0	5	0	0	135	0	0	0	2	0	0	1
Lane Group Flow (vph)	5	5	0	5	77	0	5	2284	3	198	2477	4
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	13.4	12.4		13.4	12.4		96.3	95.1	95.1	119.9	114.2	114.2
Effective Green, g (s)	15.4	14.4		15.4	14.4		98.3	97.1	97.1	120.9	116.2	116.2
Actuated g/C Ratio	0.10	0.10		0.10	0.10		0.66	0.65	0.65	0.81	0.77	0.77
Clearance Time (s)	4.5	4.6		4.5	4.6		4.5	7.6	7.6	4.5	7.6	7.6
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	74	167		150	154		76	2925	1036	304	3501	1240
v/s Ratio Prot	c0.00	0.00		0.00	c0.05		0.00	c0.51		c0.09	0.55	
v/s Ratio Perm	0.01			0.00			0.04		0.00	0.43		0.00
v/c Ratio	0.07	0.03		0.03	0.50		0.07	0.78	0.00	0.65	0.71	0.00
Uniform Delay, d1	60.9	61.5		60.6	64.4		10.4	18.9	9.3	45.9	8.4	3.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.1		0.1	2.6		0.4	2.1	0.0	4.9	1.2	0.0
Delay (s)	61.2	61.6		60.7	67.0		10.8	21.0	9.4	50.8	9.7	3.8
Level of Service	E	E		E	E		B	C	A	D	A	A
Approach Delay (s)		61.5			66.8			21.0			12.7	
Approach LOS		E			E			C			B	

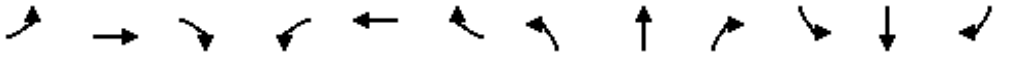
Intersection Summary			
HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	15.2
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	5	10	265	106	5	2183	85	198	2284	5
v/c Ratio	0.02	0.02	0.76	0.22	0.03	0.95	0.10	0.65	0.78	0.00
Control Delay	27.4	19.7	52.4	7.2	8.2	37.3	5.6	33.4	18.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.4	19.7	52.4	7.2	8.2	37.3	5.6	33.4	18.1	0.0
Queue Length 50th (m)	0.8	0.8	53.0	0.8	0.4	187.7	1.6	23.1	123.0	0.0
Queue Length 95th (m)	3.4	4.5	73.6	12.2	1.8	#243.0	10.0	#67.5	#250.6	0.0
Internal Link Dist (m)		170.5		265.7		219.0			423.7	
Turn Bay Length (m)	85.0		85.0		85.0		85.0	85.0		85.0
Base Capacity (vph)	405	620	488	637	180	2299	848	304	2946	1064
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.02	0.54	0.17	0.03	0.95	0.10	0.65	0.78	0.00

Intersection Summary

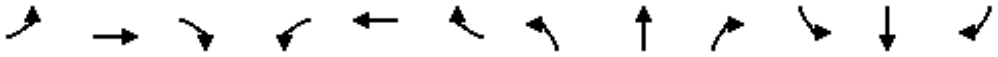
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	5	5	265	5	101	5	2183	85	198	2284	5
Future Volume (vph)	5	5	5	265	5	101	5	2183	85	198	2284	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.6	2.6		3.6	2.6		3.5	5.6	5.6	3.5	5.6	5.6
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	0.93		1.00	0.86		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	1742		1789	1614		1789	4520	1601	1789	4520	1601
Flt Permitted	0.62	1.00		0.75	1.00		0.07	1.00	1.00	0.07	1.00	1.00
Satd. Flow (perm)	1175	1742		1415	1614		137	4520	1601	129	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	5	5	265	5	101	5	2183	85	198	2284	5
RTOR Reduction (vph)	0	4	0	0	75	0	0	0	34	0	0	2
Lane Group Flow (vph)	5	6	0	265	31	0	5	2183	51	198	2284	3
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	26.0	26.0		26.0	26.0		55.2	54.0	54.0	71.8	66.1	66.1
Effective Green, g (s)	27.0	28.0		27.0	28.0		57.2	56.0	56.0	72.8	68.1	68.1
Actuated g/C Ratio	0.25	0.25		0.25	0.25		0.52	0.51	0.51	0.66	0.62	0.62
Clearance Time (s)	4.6	4.6		4.6	4.6		4.5	7.6	7.6	4.5	7.6	7.6
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	288	443		347	410		104	2301	815	301	2798	991
v/s Ratio Prot		0.00			0.02		0.00	c0.48		c0.09	c0.51	
v/s Ratio Perm	0.00			c0.19			0.02		0.03	0.35		0.00
v/c Ratio	0.02	0.01		0.76	0.07		0.05	0.95	0.06	0.66	0.82	0.00
Uniform Delay, d1	31.4	30.7		38.5	31.2		16.7	25.6	13.7	29.7	16.1	8.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	0.0		9.6	0.1		0.2	10.1	0.1	5.1	2.8	0.0
Delay (s)	31.5	30.7		48.1	31.2		16.9	35.7	13.8	34.8	18.9	8.0
Level of Service	C	C		D	C		B	D	B	C	B	A
Approach Delay (s)		30.9			43.3			34.9			20.1	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.7
Intersection Capacity Utilization	85.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

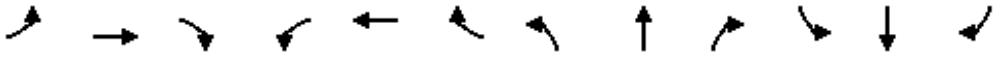


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	280	160	85	410	37	18	45	2174	239	45	2352	68
v/c Ratio	0.74	0.60	0.30	1.35	0.14	0.06	0.31	0.81	0.24	0.31	0.88	0.07
Control Delay	54.1	61.4	9.4	215.4	48.3	0.4	13.8	24.7	5.6	13.8	28.1	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.1	61.4	9.4	215.4	48.3	0.4	13.8	24.7	5.6	13.8	28.1	2.5
Queue Length 50th (m)	61.5	38.8	0.0	~103.0	8.3	0.0	3.6	177.3	9.1	3.6	207.4	0.0
Queue Length 95th (m)	89.3	61.0	11.2	#156.3	18.3	0.0	8.7	225.5	23.4	8.7	263.3	5.6
Internal Link Dist (m)		189.2			233.6			642.4			323.5	
Turn Bay Length (m)	85.0		85.0	85.0		85.0	85.0		85.0	85.0		85.0
Base Capacity (vph)	378	579	537	303	593	548	145	2676	1010	145	2676	979
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	0.74	0.28	0.16	1.35	0.06	0.03	0.31	0.81	0.24	0.31	0.88	0.07

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

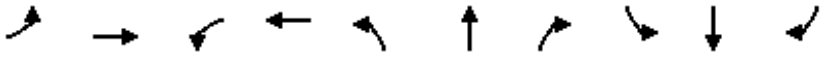
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	280	160	85	410	37	18	45	2174	239	45	2352	68
Future Volume (vph)	280	160	85	410	37	18	45	2174	239	45	2352	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	2.6	4.6	3.5	2.6	4.6	3.5	5.6	5.6	3.5	5.6	5.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	1883	1601	1789	1883	1601	1789	4520	1601	1789	4520	1601
Flt Permitted	0.63	1.00	1.00	0.42	1.00	1.00	0.05	1.00	1.00	0.05	1.00	1.00
Satd. Flow (perm)	1182	1883	1601	793	1883	1601	101	4520	1601	101	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	280	160	85	410	37	18	45	2174	239	45	2352	68
RTOR Reduction (vph)	0	0	74	0	0	16	0	0	64	0	0	28
Lane Group Flow (vph)	280	160	11	410	37	2	45	2174	175	45	2352	40
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	33.4	17.1	17.1	28.2	14.5	14.5	77.3	73.4	73.4	77.3	73.4	73.4
Effective Green, g (s)	35.4	19.1	17.1	30.2	16.5	14.5	79.3	75.4	75.4	79.3	75.4	75.4
Actuated g/C Ratio	0.27	0.15	0.13	0.23	0.13	0.11	0.61	0.58	0.58	0.61	0.58	0.58
Clearance Time (s)	4.5	4.6	4.6	4.5	4.6	4.6	4.5	7.6	7.6	4.5	7.6	7.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	404	278	211	298	240	179	125	2635	933	125	2635	933
v/s Ratio Prot	c0.09	0.08		c0.16	0.02		c0.01	0.48		0.01	c0.52	
v/s Ratio Perm	0.10		0.01	c0.16		0.00	0.21		0.11	0.21		0.02
v/c Ratio	0.69	0.58	0.05	1.38	0.15	0.01	0.36	0.83	0.19	0.36	0.89	0.04
Uniform Delay, d1	40.5	51.3	49.0	47.5	50.2	51.0	24.7	21.7	12.6	20.9	23.4	11.5
Progression 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
Incremental Delay, d2	5.1	2.9	0.1	188.9	0.3	0.0	1.8	3.1	0.4	1.8	5.1	0.1
Delay (s)	45.6	54.2	49.1	236.4	50.5	51.1	26.4	24.8	13.1	22.6	28.6	11.6
Level of Service	D	D	D	F	D	D	C	C	B	C	C	B
Approach Delay (s)		48.8			214.4			23.6			28.0	
Approach LOS		D			F			C			C	

Intersection Summary			
HCM 2000 Control Delay	42.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	129.3	Sum of lost time (s)	15.2
Intersection Capacity Utilization	87.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

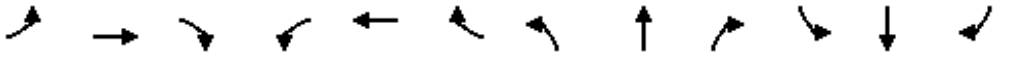


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	182	259	10	183	221	2145	6	157	2529	117
v/c Ratio	0.94	0.52	0.08	0.37	0.98	0.79	0.01	0.78	0.95	0.12
Control Delay	105.4	24.3	44.6	14.0	96.8	26.1	0.0	60.5	38.8	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	105.4	24.3	44.6	14.0	96.8	26.1	0.0	60.5	38.8	6.2
Queue Length 50th (m)	51.9	28.1	2.3	9.3	~51.4	209.1	0.0	29.4	297.0	5.4
Queue Length 95th (m)	#95.3	55.8	7.6	29.8	#106.3	232.7	0.0	#61.2	#348.7	14.5
Internal Link Dist (m)		265.1		307.9		467.3			642.4	
Turn Bay Length (m)	85.0		85.0		85.0		85.0	85.0		85.0
Base Capacity (vph)	221	545	152	548	226	2711	977	219	2650	969
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.48	0.07	0.33	0.98	0.79	0.01	0.72	0.95	0.12

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.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	182	37	222	10	34	149	221	2145	6	157	2529	117
Future Volume (vph)	182	37	222	10	34	149	221	2145	6	157	2529	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.6	2.6		3.6	2.6		3.5	5.6	5.6	3.5	5.6	5.6
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	0.87		1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	1641		1789	1653		1789	4520	1601	1789	4520	1601
Flt Permitted	0.45	1.00		0.31	1.00		0.05	1.00	1.00	0.05	1.00	1.00
Satd. Flow (perm)	848	1641		585	1653		87	4520	1601	89	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	182	37	222	10	34	149	221	2145	6	157	2529	117
RTOR Reduction (vph)	0	110	0	0	108	0	0	0	2	0	0	31
Lane Group Flow (vph)	182	149	0	10	75	0	221	2145	4	157	2529	86
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	32.4	32.4		32.4	32.4		98.4	85.3	85.3	94.6	83.4	83.4
Effective Green, g (s)	33.4	34.4		33.4	34.4		100.4	87.3	87.3	96.6	85.4	85.4
Actuated g/C Ratio	0.23	0.24		0.23	0.24		0.69	0.60	0.60	0.66	0.59	0.59
Clearance Time (s)	4.6	4.6		4.6	4.6		4.5	7.6	7.6	4.5	7.6	7.6
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	194	387		134	390		224	2710	959	201	2651	939
v/s Ratio Prot		0.09			0.05		c0.10	0.47		0.07	0.56	
v/s Ratio Perm	c0.21			0.02			c0.58		0.00	0.45		0.05
v/c Ratio	0.94	0.39		0.07	0.19		0.99	0.79	0.00	0.78	0.95	0.09
Uniform Delay, d1	55.1	46.7		44.0	44.5		52.8	22.2	11.7	41.7	28.3	13.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	46.7	0.6		0.2	0.2		55.8	2.5	0.0	17.7	9.6	0.2
Delay (s)	101.8	47.4		44.2	44.7		108.6	24.7	11.7	59.4	37.9	13.3
Level of Service	F	D		D	D		F	C	B	E	D	B
Approach Delay (s)		69.8			44.7			32.5			38.0	
Approach LOS		E			D			C			D	

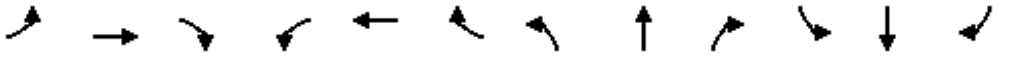
Intersection Summary			
HCM 2000 Control Delay	38.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	145.6	Sum of lost time (s)	11.7
Intersection Capacity Utilization	96.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	157	213	84	66	113	2151	150	116	2504	140
v/c Ratio	0.72	0.59	0.86	0.19	0.53	0.75	0.14	0.52	0.87	0.13
Control Delay	64.7	32.9	106.5	10.7	27.3	19.1	3.2	26.3	23.3	4.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.7	32.9	106.5	10.7	27.3	19.1	3.2	26.3	23.3	4.0
Queue Length 50th (m)	35.4	27.8	19.4	0.4	9.0	135.5	1.6	9.2	179.6	2.8
Queue Length 95th (m)	54.2	48.6	#40.2	11.3	28.6	207.5	11.7	29.4	#294.6	13.3
Internal Link Dist (m)		318.3		354.6		485.6			467.3	
Turn Bay Length (m)	85.0		85.0		85.0		85.0	85.0		85.0
Base Capacity (vph)	401	578	180	566	214	2867	1063	222	2888	1060
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.37	0.47	0.12	0.53	0.75	0.14	0.52	0.87	0.13

Intersection Summary

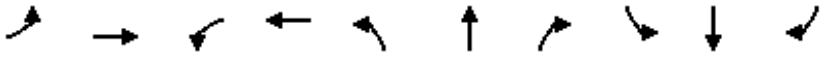
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	157	4	209	84	2	64	113	2151	150	116	2504	140
Future Volume (vph)	157	4	209	84	2	64	113	2151	150	116	2504	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.6	2.6		3.6	2.6		3.5	5.6	5.6	3.5	5.6	5.6
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	0.85		1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	1606		1789	1609		1789	4520	1601	1789	4520	1601
Flt Permitted	0.67	1.00		0.30	1.00		0.05	1.00	1.00	0.05	1.00	1.00
Satd. Flow (perm)	1270	1606		571	1609		100	4520	1601	100	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	157	4	209	84	2	64	113	2151	150	116	2504	140
RTOR Reduction (vph)	0	69	0	0	52	0	0	0	48	0	0	38
Lane Group Flow (vph)	157	144	0	84	14	0	113	2151	102	116	2504	102
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	19.6	19.6		19.6	19.6		83.1	74.1	74.1	84.3	74.7	74.7
Effective Green, g (s)	20.6	21.6		20.6	21.6		85.1	76.1	76.1	86.3	76.7	76.7
Actuated g/C Ratio	0.17	0.18		0.17	0.18		0.71	0.63	0.63	0.72	0.64	0.64
Clearance Time (s)	4.6	4.6		4.6	4.6		4.5	7.6	7.6	4.5	7.6	7.6
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	218	289		98	289		211	2866	1015	221	2889	1023
v/s Ratio Prot		0.09			0.01		0.04	0.48		c0.05	c0.55	
v/s Ratio Perm	0.12			c0.15			0.33		0.06	0.33		0.06
v/c Ratio	0.72	0.50		0.86	0.05		0.54	0.75	0.10	0.52	0.87	0.10
Uniform Delay, d1	47.0	44.3		48.3	40.7		25.6	15.3	8.6	22.1	17.5	8.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	11.1	1.4		48.0	0.1		2.6	1.9	0.2	2.2	3.8	0.2
Delay (s)	58.1	45.7		96.2	40.8		28.2	17.2	8.8	24.4	21.3	8.5
Level of Service	E	D		F	D		C	B	A	C	C	A
Approach Delay (s)		50.9			71.8			17.2			20.8	
Approach LOS		D			E			B			C	

Intersection Summary			
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.7
Intersection Capacity Utilization	87.1%	ICU Level of Service	E
Analysis Period (min)	15		

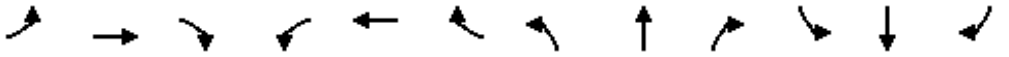
c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	5	264	46	50	105	2346	8	13	2809	5
v/c Ratio	0.02	0.78	0.81	0.15	0.61	0.71	0.01	0.10	0.92	0.00
Control Delay	46.6	60.6	130.6	15.0	42.4	14.5	0.0	6.9	28.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.6	60.6	130.6	15.0	42.4	14.5	0.0	6.9	28.8	0.0
Queue Length 50th (m)	1.3	59.9	13.3	1.2	14.0	126.7	0.0	0.8	292.1	0.0
Queue Length 95th (m)	4.9	85.7	#31.8	11.9	#45.0	237.0	0.0	3.0	#387.0	0.0
Internal Link Dist (m)		271.9		333.5		436.2			485.6	
Turn Bay Length (m)	85.0		85.0		85.0		85.0	85.0		85.0
Base Capacity (vph)	333	460	83	456	173	3325	1189	132	3038	1090
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.57	0.55	0.11	0.61	0.71	0.01	0.10	0.92	0.00

Intersection Summary

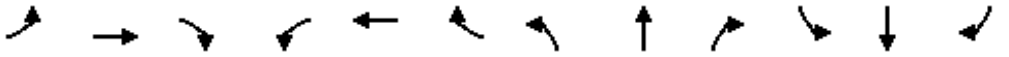
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	5	259	46	5	45	105	2346	8	13	2809	5
Future Volume (vph)	5	5	259	46	5	45	105	2346	8	13	2809	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.6	2.6		3.6	2.6		3.5	5.6	5.6	3.5	5.6	5.6
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	0.85		1.00	0.86		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	1606		1789	1629		1789	4520	1601	1789	4520	1601
Flt Permitted	0.70	1.00		0.18	1.00		0.04	1.00	1.00	0.04	1.00	1.00
Satd. Flow (perm)	1317	1606		330	1629		73	4520	1601	75	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	5	259	46	5	45	105	2346	8	13	2809	5
RTOR Reduction (vph)	0	47	0	0	37	0	0	0	2	0	0	2
Lane Group Flow (vph)	5	217	0	46	13	0	105	2346	6	13	2809	3
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	25.2	25.2		25.2	25.2		112.6	105.7	105.7	101.2	98.8	98.8
Effective Green, g (s)	26.2	27.2		26.2	27.2		113.6	107.7	107.7	103.2	100.8	100.8
Actuated g/C Ratio	0.17	0.18		0.17	0.18		0.76	0.72	0.72	0.69	0.67	0.67
Clearance Time (s)	4.6	4.6		4.6	4.6		4.5	7.6	7.6	4.5	7.6	7.6
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	230	291		57	295		173	3245	1149	90	3037	1075
v/s Ratio Prot		0.13			0.01		c0.04	0.52		0.00	c0.62	
v/s Ratio Perm	0.00			c0.14			0.42		0.00	0.10		0.00
v/c Ratio	0.02	0.74		0.81	0.04		0.61	0.72	0.00	0.14	0.92	0.00
Uniform Delay, d1	51.3	58.1		59.5	50.7		45.3	12.4	6.0	12.7	21.3	8.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	9.9		55.0	0.1		5.9	1.4	0.0	0.7	6.2	0.0
Delay (s)	51.3	68.0		114.5	50.7		51.2	13.8	6.0	13.4	27.5	8.1
Level of Service	D	E		F	D		D	B	A	B	C	A
Approach Delay (s)		67.7			81.3			15.4			27.4	
Approach LOS		E			F			B			C	

Intersection Summary			
HCM 2000 Control Delay	25.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	11.7
Intersection Capacity Utilization	95.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

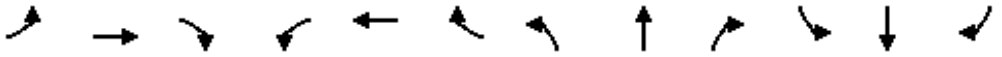


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	96	13	299	88	40	201	233	2161	118	106	2731	276
v/c Ratio	0.32	0.04	0.84	0.29	0.13	0.56	1.09	0.78	0.12	0.62	1.03	0.28
Control Delay	44.4	44.8	50.7	43.6	46.7	24.2	124.8	23.2	5.0	39.1	53.0	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.4	44.8	50.7	43.6	46.7	24.2	124.8	23.2	5.0	39.1	53.0	7.5
Queue Length 50th (m)	20.7	2.9	44.1	18.8	9.1	15.8	~52.6	168.1	3.5	10.5	~318.9	14.4
Queue Length 95th (m)	35.3	8.8	77.0	33.1	19.3	39.4	#118.1	236.5	13.5	#37.2	#403.1	34.9
Internal Link Dist (m)		291.2			376.2			390.5			436.2	
Turn Bay Length (m)	85.0		85.0	85.0		85.0	85.0		85.0	85.0		85.0
Base Capacity (vph)	300	551	540	306	551	541	213	2764	1011	176	2657	1002
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	0.32	0.02	0.55	0.29	0.07	0.37	1.09	0.78	0.12	0.60	1.03	0.28

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

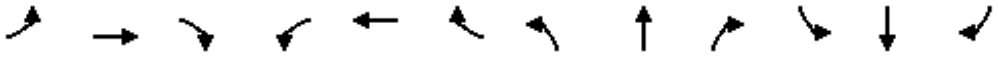
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	13	299	88	40	201	233	2161	118	106	2731	276
Future Volume (vph)	96	13	299	88	40	201	233	2161	118	106	2731	276
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	2.6	4.6	3.5	2.6	4.6	3.5	5.6	5.6	3.5	5.6	5.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	1883	1601	1789	1883	1601	1789	4520	1601	1789	4520	1601
Flt Permitted	0.73	1.00	1.00	0.75	1.00	1.00	0.05	1.00	1.00	0.05	1.00	1.00
Satd. Flow (perm)	1377	1883	1601	1411	1883	1601	93	4520	1601	97	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	96	13	299	88	40	201	233	2161	118	106	2731	276
RTOR Reduction (vph)	0	0	113	0	0	114	0	0	32	0	0	61
Lane Group Flow (vph)	96	13	186	88	40	87	233	2161	86	106	2731	215
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	25.2	20.2	20.2	25.2	20.2	20.2	90.2	79.7	79.7	84.0	76.6	76.6
Effective Green, g (s)	27.2	22.2	20.2	27.2	22.2	20.2	92.2	81.7	81.7	86.0	78.6	78.6
Actuated g/C Ratio	0.20	0.17	0.15	0.20	0.17	0.15	0.69	0.61	0.61	0.64	0.59	0.59
Clearance Time (s)	4.5	4.6	4.6	4.5	4.6	4.6	4.5	7.6	7.6	4.5	7.6	7.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	299	313	242	304	313	242	210	2766	979	168	2661	942
v/s Ratio Prot	c0.01	0.01		0.01	0.02		c0.10	0.48		0.04	0.60	
v/s Ratio Perm	0.05		c0.12	0.05		0.05	c0.67		0.05	0.36		0.13
v/c Ratio	0.32	0.04	0.77	0.29	0.13	0.36	1.11	0.78	0.09	0.63	1.03	0.23
Uniform Delay, d1	44.7	46.7	54.4	44.5	47.4	50.9	47.8	19.3	10.6	24.8	27.5	13.0
Progression 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
Incremental Delay, d2	0.6	0.1	13.7	0.5	0.2	0.9	94.5	2.3	0.2	7.5	24.6	0.6
Delay (s)	45.3	46.8	68.1	45.0	47.6	51.8	142.4	21.5	10.8	32.3	52.0	13.6
Level of Service	D	D	E	D	D	D	F	C	B	C	D	B
Approach Delay (s)		62.0			49.5			32.2			47.9	
Approach LOS		E			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	42.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	133.5	Sum of lost time (s)	15.2
Intersection Capacity Utilization	89.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

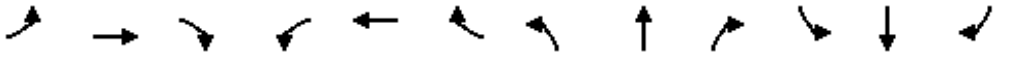


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	141	1788	523	534	2202	643	341	1288	595	338	1639	166
v/c Ratio	0.80	1.08	0.75	1.24	1.11	0.67	1.30	0.99	0.78	0.94	1.16	0.28
Control Delay	97.3	90.7	33.4	177.6	96.1	22.4	208.8	74.5	38.1	98.7	122.2	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.3	90.7	33.4	177.6	96.1	22.4	208.8	74.5	38.1	98.7	122.2	12.2
Queue Length 50th (m)	21.0	~238.4	90.2	~97.7	~300.4	109.9	~64.2	154.3	129.2	50.5	~230.5	8.7
Queue Length 95th (m)	#38.4	#271.6	135.9	#133.7	#331.7	153.1	#95.5	#192.5	180.6	#79.9	#264.0	26.5
Internal Link Dist (m)		1711.9			759.7			657.0			690.8	
Turn Bay Length (m)	130.0		110.0	300.0		70.0	110.0		70.0	130.0		85.0
Base Capacity (vph)	177	1654	701	430	1982	963	263	1296	763	359	1419	591
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	0.80	1.08	0.75	1.24	1.11	0.67	1.30	0.99	0.78	0.94	1.16	0.28

Intersection Summary

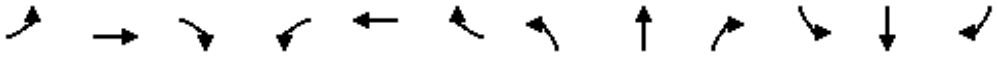
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	141	1788	523	534	2202	643	341	1288	595	338	1639	166
Future Volume (vph)	141	1788	523	534	2202	643	341	1288	595	338	1639	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.4	5.4	3.0	5.4	2.0	3.0	5.0	2.0	3.0	5.0	5.0
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3219	4476	1601	3471	4520	1601	3471	4476	1601	3471	4476	1601
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3219	4476	1601	3471	4520	1601	3471	4476	1601	3471	4476	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	141	1788	523	534	2202	643	341	1288	595	338	1639	166
RTOR Reduction (vph)	0	0	110	0	0	27	0	0	36	0	0	84
Lane Group Flow (vph)	141	1788	413	534	2202	616	341	1288	559	338	1639	82
Heavy Vehicles (%)	10%	3%	2%	2%	2%	2%	2%	3%	2%	2%	3%	2%
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6	7	3	8	1	7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	7.0	51.6	51.6	17.0	61.6	75.6	10.0	40.0	57.0	14.0	44.0	44.0
Effective Green, g (s)	8.0	53.6	53.6	18.0	63.6	79.6	11.0	42.0	61.0	15.0	46.0	46.0
Actuated g/C Ratio	0.06	0.37	0.37	0.12	0.44	0.55	0.08	0.29	0.42	0.10	0.32	0.32
Clearance Time (s)	4.0	7.4	7.4	4.0	7.4	4.0	4.0	7.0	4.0	4.0	7.0	7.0
Vehicle Extension (s)	5.0	3.0	3.0	5.0	3.0	4.0	4.0	5.0	5.0	4.0	5.0	5.0
Lane Grp Cap (vph)	177	1654	591	430	1982	878	263	1296	673	359	1419	507
v/s Ratio Prot	0.04	0.40		c0.15	c0.49	0.08	c0.10	0.29	0.11	c0.10	c0.37	
v/s Ratio Perm			0.26			0.31			0.24			0.05
v/c Ratio	0.80	1.08	0.70	1.24	1.11	0.70	1.30	0.99	0.83	0.94	1.16	0.16
Uniform Delay, d1	67.7	45.7	38.9	63.5	40.7	24.0	67.0	51.4	37.4	64.6	49.5	35.6
Progression 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
Incremental Delay, d2	24.2	47.6	3.6	127.2	57.8	2.7	158.6	23.6	9.3	32.9	78.2	0.7
Delay (s)	91.9	93.3	42.5	190.7	98.5	26.7	225.6	74.9	46.7	97.4	127.7	36.3
Level of Service	F	F	D	F	F	C	F	E	D	F	F	D
Approach Delay (s)		82.4			99.4			90.5			115.8	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	96.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	106.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

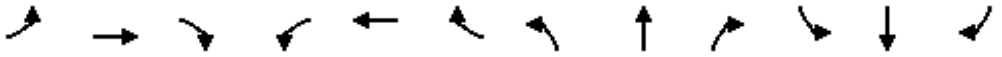


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	95	102	157	296	231	341	328	2376	310	221	1902	121
v/c Ratio	0.34	0.16	0.39	0.87	0.33	0.79	0.91	0.94	0.32	1.02	0.88	0.15
Control Delay	41.2	46.0	9.4	71.3	47.8	39.1	70.0	37.5	9.6	106.3	38.8	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.2	46.0	9.4	71.3	47.8	39.1	70.0	37.5	9.6	106.3	38.8	5.9
Queue Length 50th (m)	19.8	12.2	0.0	70.2	28.4	44.3	70.4	238.1	19.4	~46.3	187.7	2.0
Queue Length 95th (m)	33.9	20.2	17.8	99.4	40.1	78.8	#146.8	#346.0	45.7	#113.1	#269.4	14.4
Internal Link Dist (m)		1074.9			770.5			396.6			272.1	
Turn Bay Length (m)	85.0		85.0	120.0		85.0	170.0		70.0	170.0		70.0
Base Capacity (vph)	279	1008	550	341	1064	578	360	2529	964	216	2163	822
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	0.34	0.10	0.29	0.87	0.22	0.59	0.91	0.94	0.32	1.02	0.88	0.15

Intersection Summary

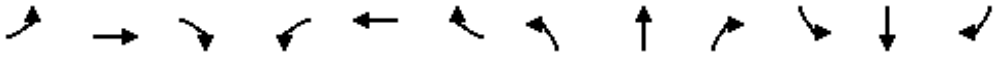
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	102	157	296	231	341	328	2376	310	221	1902	121
Future Volume (vph)	95	102	157	296	231	341	328	2376	310	221	1902	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.5	3.2	5.2	3.0	3.2	5.2	3.0	5.8	5.8	3.0	5.8	5.8
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	3510	1601	1789	3579	1601	1789	4520	1601	1789	4520	1601
Flt Permitted	0.53	1.00	1.00	0.64	1.00	1.00	0.06	1.00	1.00	0.06	1.00	1.00
Satd. Flow (perm)	990	3510	1601	1212	3579	1601	112	4520	1601	117	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	95	102	157	296	231	341	328	2376	310	221	1902	121
RTOR Reduction (vph)	0	0	131	0	0	144	0	0	69	0	0	56
Lane Group Flow (vph)	95	102	26	296	231	197	328	2376	241	221	1902	65
Heavy Vehicles (%)	2%	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	8		3	4		5	2		1	6	
Permitted Phases	8		8	4		4	2		2	6		6
Actuated Green, G (s)	28.0	22.9	22.9	31.3	24.3	24.3	89.4	74.4	74.4	74.3	63.3	63.3
Effective Green, g (s)	32.0	24.9	22.9	33.3	26.3	24.3	90.4	76.4	76.4	76.3	65.3	65.3
Actuated g/C Ratio	0.23	0.18	0.17	0.24	0.19	0.18	0.66	0.56	0.56	0.56	0.48	0.48
Clearance Time (s)	4.5	5.2	5.2	4.0	5.2	5.2	4.0	7.8	7.8	4.0	7.8	7.8
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	274	641	268	329	690	285	358	2533	897	212	2165	767
v/s Ratio Prot	0.02	0.03		c0.05	0.06		c0.16	0.53		c0.09	0.42	
v/s Ratio Perm	0.06		0.02	c0.17		0.12	0.45		0.15	c0.49		0.04
v/c Ratio	0.35	0.16	0.10	0.90	0.33	0.69	0.92	0.94	0.27	1.04	0.88	0.09
Uniform Delay, d1	42.2	46.9	48.0	49.0	47.5	52.5	44.8	27.8	15.5	43.9	31.9	19.3
Progression 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
Incremental Delay, d2	0.8	0.2	0.3	25.7	0.6	8.9	27.3	8.3	0.7	73.4	5.5	0.2
Delay (s)	43.0	47.1	48.3	74.8	48.1	61.4	72.1	36.0	16.2	117.3	37.4	19.5
Level of Service	D	D	D	E	D	E	E	D	B	F	D	B
Approach Delay (s)		46.5			62.4			37.9			44.3	
Approach LOS		D			E			D			D	

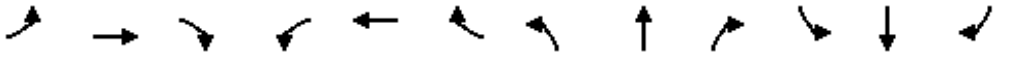
Intersection Summary			
HCM 2000 Control Delay	43.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	136.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	97.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	263	1344	178	536	1192	109	297	903	428	283	1195	147
v/c Ratio	0.60	0.95	0.29	0.98	0.76	0.17	0.87	0.67	0.65	0.84	0.89	0.26
Control Delay	62.4	59.5	8.3	90.6	42.7	5.7	84.9	43.3	21.6	82.3	54.2	6.4
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	62.4	59.5	8.3	90.6	42.7	5.7	84.9	43.3	21.6	82.3	54.2	6.4
Queue Length 50th (m)	35.1	145.9	3.9	74.3	114.6	0.0	40.9	87.1	41.8	38.9	126.5	0.0
Queue Length 95th (m)	49.8	#180.2	20.6	#110.6	134.5	12.3	#65.2	104.7	79.2	#61.5	148.7	15.2
Internal Link Dist (m)		239.5			177.4			308.0			325.9	
Turn Bay Length (m)	142.0		89.0	147.0		118.0	120.0		132.0	120.0		115.0
Base Capacity (vph)	436	1419	610	545	1626	646	341	1365	657	335	1349	558
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	0.60	0.95	0.29	0.98	0.73	0.17	0.87	0.66	0.65	0.84	0.89	0.26

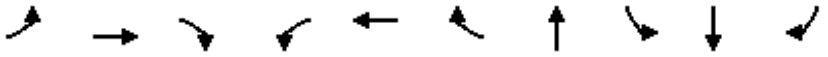
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	263	1344	178	536	1192	109	297	903	428	283	1195	147
Future Volume (vph)	263	1344	178	536	1192	109	297	903	428	283	1195	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3340	4520	1601	3340	4520	1601	3404	4391	1570	3471	4391	1484
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3340	4520	1601	3340	4520	1601	3404	4391	1570	3471	4391	1484
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	263	1344	178	536	1192	109	297	903	428	283	1195	147
RTOR Reduction (vph)	0	0	108	0	0	71	0	0	170	0	0	102
Lane Group Flow (vph)	263	1344	70	536	1192	38	297	903	258	283	1195	45
Heavy Vehicles (%)	6%	2%	2%	6%	2%	2%	4%	5%	4%	2%	5%	10%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	16.6	40.3	40.3	21.0	44.7	44.7	12.5	39.6	39.6	12.0	39.1	39.1
Effective Green, g (s)	17.6	42.3	42.3	22.0	46.7	46.7	13.5	41.6	41.6	13.0	41.1	41.1
Actuated g/C Ratio	0.13	0.31	0.31	0.16	0.35	0.35	0.10	0.31	0.31	0.10	0.31	0.31
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	3.2	3.2	3.0	3.2	3.2
Lane Grp Cap (vph)	436	1419	502	545	1567	555	341	1356	484	334	1339	452
v/s Ratio Prot	0.08	c0.30		c0.16	0.26		c0.09	0.21		0.08	c0.27	
v/s Ratio Perm			0.04			0.02			0.16			0.03
v/c Ratio	0.60	0.95	0.14	0.98	0.76	0.07	0.87	0.67	0.53	0.85	0.89	0.10
Uniform Delay, d1	55.3	45.1	33.1	56.2	39.0	29.4	59.7	40.5	38.5	59.9	44.7	33.5
Progression 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
Incremental Delay, d2	2.4	13.3	0.2	34.1	2.4	0.1	20.8	1.3	1.2	17.7	8.0	0.1
Delay (s)	57.6	58.4	33.3	90.3	41.4	29.5	80.5	41.8	39.7	77.6	52.7	33.6
Level of Service	E	E	C	F	D	C	F	D	D	E	D	C
Approach Delay (s)		55.8			55.0			48.3			55.3	
Approach LOS		E			D			D			E	

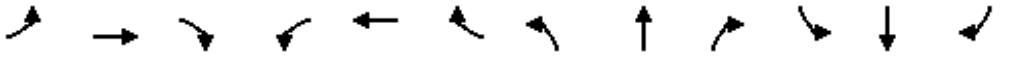
Intersection Summary			
HCM 2000 Control Delay	53.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	134.7	Sum of lost time (s)	15.8
Intersection Capacity Utilization	87.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	158	1782	140	9	1520	173	359	145	81	170
v/c Ratio	0.69	0.71	0.15	0.04	0.75	0.22	0.75	0.43	0.14	0.29
Control Delay	33.3	19.5	3.4	10.7	25.3	3.7	38.2	29.1	22.0	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.3	19.5	3.4	10.7	25.3	3.7	38.2	29.1	22.0	7.9
Queue Length 50th (m)	12.6	91.7	0.2	0.6	95.0	0.0	56.9	20.7	10.3	4.8
Queue Length 95th (m)	#48.0	#167.9	10.9	3.1	135.4	12.1	88.6	37.3	20.1	18.2
Internal Link Dist (m)		1174.8			389.4		298.2		317.5	
Turn Bay Length (m)	130.0		85.0	85.0		85.0		85.0		85.0
Base Capacity (vph)	229	2526	955	201	2025	790	625	449	764	745
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.71	0.15	0.04	0.75	0.22	0.57	0.32	0.11	0.23

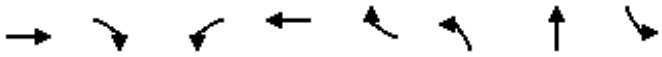
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	158	1782	140	9	1520	173	208	108	43	145	81	170
Future Volume (vph)	158	1782	140	9	1520	173	208	108	43	145	81	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.6	5.6	3.0	5.6	5.6		3.0		4.0	3.0	5.0
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (prot)	1789	4520	1601	1789	4391	1512		1784		1772	1746	1601
Flt Permitted	0.08	1.00	1.00	0.09	1.00	1.00		0.77		0.56	1.00	1.00
Satd. Flow (perm)	153	4520	1601	162	4391	1512		1417		1051	1746	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	158	1782	140	9	1520	173	208	108	43	145	81	170
RTOR Reduction (vph)	0	0	63	0	0	90	0	5	0	0	0	93
Lane Group Flow (vph)	158	1782	77	9	1520	83	0	354	0	145	81	77
Heavy Vehicles (%)	2%	2%	2%	2%	5%	8%	2%	2%	10%	3%	10%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	56.4	51.4	51.4	46.4	45.4	45.4		29.7		29.7	29.7	29.7
Effective Green, g (s)	57.4	53.4	53.4	48.4	47.4	47.4		31.7		30.7	31.7	29.7
Actuated g/C Ratio	0.58	0.54	0.54	0.49	0.48	0.48		0.32		0.31	0.32	0.30
Clearance Time (s)	4.0	7.6	7.6	4.0	7.6	7.6		5.0		5.0	5.0	5.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0		5.0		5.0	5.0	5.0
Lane Grp Cap (vph)	221	2445	866	112	2108	726		455		326	560	481
v/s Ratio Prot	c0.06	c0.39		0.00	0.35						0.05	
v/s Ratio Perm	0.36		0.05	0.04		0.05		c0.25		0.14		0.05
v/c Ratio	0.71	0.73	0.09	0.08	0.72	0.11		0.78		0.44	0.14	0.16
Uniform Delay, d1	16.8	17.2	10.9	15.0	20.4	14.1		30.3		27.2	23.8	25.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	10.5	1.9	0.2	0.3	2.2	0.3		9.5		2.0	0.2	0.3
Delay (s)	27.3	19.1	11.1	15.3	22.6	14.4		39.8		29.2	24.1	25.7
Level of Service	C	B	B	B	C	B		D		C	C	C
Approach Delay (s)		19.2			21.7			39.8			26.6	
Approach LOS		B			C			D			C	

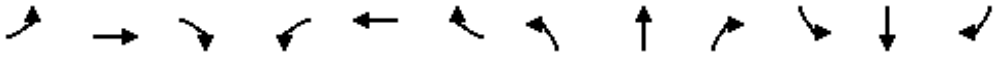
Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	98.7	Sum of lost time (s)	11.6
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL
Lane Group Flow (vph)	1778	156	35	1323	12	379	39	163
v/c Ratio	0.74	0.17	0.35	0.57	0.01	0.78	0.07	0.35
Control Delay	17.4	2.8	26.6	14.2	4.4	33.2	13.7	19.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.4	2.8	26.6	14.2	4.4	33.2	13.7	19.7
Queue Length 50th (m)	73.5	0.0	2.7	47.6	0.0	46.4	3.2	16.6
Queue Length 95th (m)	130.1	9.7	#14.9	86.0	2.2	75.2	8.5	30.0
Internal Link Dist (m)	389.4			948.2			362.8	
Turn Bay Length (m)		85.0	85.0		85.0	85.0		85.0
Base Capacity (vph)	2408	926	100	2318	861	798	948	772
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.17	0.35	0.57	0.01	0.47	0.04	0.21

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1778	156	35	1323	12	379	7	32	163	0	0
Future Volume (vph)	0	1778	156	35	1323	12	379	7	32	163	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.6	5.6	6.6	5.6	5.6	3.6	2.6		3.6		
Lane Util. Factor		*0.80	1.00	1.00	*0.80	1.00	1.00	1.00		1.00		
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00		
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95		
Satd. Flow (prot)		4520	1601	1789	4350	1601	1789	1652		1789		
Flt Permitted		1.00	1.00	0.10	1.00	1.00	0.76	1.00		0.73		
Satd. Flow (perm)		4520	1601	194	4350	1601	1426	1652		1378		
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1778	156	35	1323	12	379	7	32	163	0	0
RTOR Reduction (vph)	0	0	73	0	0	6	0	3	0	0	0	0
Lane Group Flow (vph)	0	1778	83	35	1323	6	379	36	0	163	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		37.8	37.8	37.8	37.8	37.8	24.6	24.6		24.6		
Effective Green, g (s)		39.8	39.8	38.8	39.8	39.8	25.6	26.6		25.6		
Actuated g/C Ratio		0.53	0.53	0.52	0.53	0.53	0.34	0.36		0.34		
Clearance Time (s)		7.6	7.6	7.6	7.6	7.6	4.6	4.6		4.6		
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0		
Lane Grp Cap (vph)		2411	854	100	2320	854	489	589		472		
v/s Ratio Prot		c0.39			0.30			0.02				
v/s Ratio Perm			0.05	0.18		0.00	c0.27			0.12		
v/c Ratio		0.74	0.10	0.35	0.57	0.01	0.78	0.06		0.35		
Uniform Delay, d1		13.4	8.6	10.5	11.7	8.1	21.9	15.8		18.3		
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00		
Incremental Delay, d2		2.1	0.2	9.4	1.0	0.0	7.5	0.0		0.4		
Delay (s)		15.4	8.8	19.9	12.7	8.2	29.5	15.8		18.7		
Level of Service		B	A	B	B	A	C	B		B		
Approach Delay (s)		14.9			12.8			28.2			18.7	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	74.6	Sum of lost time (s)	8.2
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

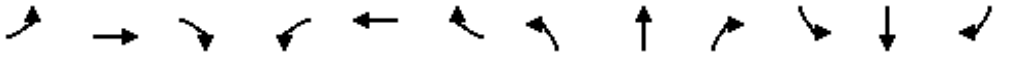
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	69	1797	122	29	921	139	189	136	93	599	260
v/c Ratio	0.36	0.95	0.17	0.19	0.51	0.19	1.02	0.15	0.12	0.67	0.32
Control Delay	31.8	53.8	12.3	56.3	53.0	20.7	111.5	22.8	2.0	34.8	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.8	53.8	12.3	56.3	53.0	20.7	111.5	22.8	2.0	34.8	10.3
Queue Length 50th (m)	12.7	~237.5	8.2	6.1	89.0	11.7	~59.3	22.5	0.0	134.6	16.7
Queue Length 95th (m)	23.2	#270.4	22.0	m9.9	107.0	m22.9	#109.2	35.7	5.8	177.2	35.9
Internal Link Dist (m)		948.2			653.2			218.8		343.3	
Turn Bay Length (m)	85.0		85.0	85.0		85.0	85.0		85.0		85.0
Base Capacity (vph)	194	1895	716	161	1792	728	185	896	804	896	812
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.95	0.17	0.18	0.51	0.19	1.02	0.15	0.12	0.67	0.32

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

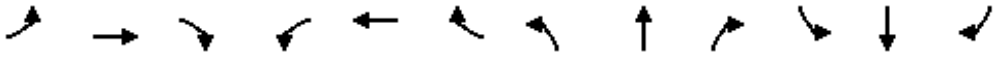
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	1797	122	29	921	139	189	136	93	0	599	260
Future Volume (vph)	69	1797	122	29	921	139	189	136	93	0	599	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.6	5.6	3.0	5.6	5.6	3.6	2.6	4.6		2.6	4.6
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)	1738	4520	1601	1789	4309	1555	1789	1883	1601		1883	1570
Flt Permitted	0.16	1.00	1.00	0.07	1.00	1.00	0.21	1.00	1.00		1.00	1.00
Satd. Flow (perm)	290	4520	1601	130	4309	1555	396	1883	1601		1883	1570
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	69	1797	122	29	921	139	189	136	93	0	599	260
RTOR Reduction (vph)	0	0	46	0	0	82	0	0	50	0	0	87
Lane Group Flow (vph)	69	1797	76	29	921	57	189	136	43	0	599	173
Heavy Vehicles (%)	5%	2%	2%	2%	7%	5%	2%	2%	2%	2%	2%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	59.3	59.3	59.3	63.2	59.6	59.6	69.4	69.4	69.4		69.4	69.4
Effective Green, g (s)	60.3	61.3	61.3	64.2	61.6	61.6	70.4	71.4	69.4		71.4	69.4
Actuated g/C Ratio	0.40	0.41	0.41	0.43	0.41	0.41	0.47	0.48	0.46		0.48	0.46
Clearance Time (s)	4.0	7.6	7.6	4.0	7.6	7.6	4.6	4.6	4.6		4.6	4.6
Vehicle Extension (s)	3.0	5.0	5.0	2.5	5.0	5.0	5.0	5.0	5.0		5.0	5.0
Lane Grp Cap (vph)	172	1847	654	123	1769	638	185	896	740		896	726
v/s Ratio Prot	0.02	c0.40		0.01	c0.21			0.07			0.32	
v/s Ratio Perm	0.15		0.05	0.09		0.04	c0.48		0.03			0.11
v/c Ratio	0.40	0.97	0.12	0.24	0.52	0.09	1.02	0.15	0.06		0.67	0.24
Uniform Delay, d1	29.7	43.5	27.5	62.6	33.1	27.0	39.8	22.2	22.3		30.2	24.3
Progression Factor	1.00	1.00	1.00	1.38	1.57	4.85	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.5	15.4	0.4	0.5	0.8	0.2	71.9	0.2	0.1		2.5	0.4
Delay (s)	31.2	59.0	27.9	86.9	52.9	131.3	111.7	22.4	22.3		32.7	24.7
Level of Service	C	E	C	F	D	F	F	C	C		C	C
Approach Delay (s)		56.1			63.9			62.8			30.3	
Approach LOS		E			E			E			C	

Intersection Summary			
HCM 2000 Control Delay	53.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	11.2
Intersection Capacity Utilization	97.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



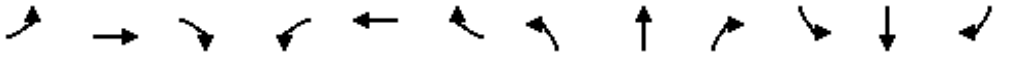
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	277	1416	198	312	871	44	173	2116	214	115	1324	224
v/c Ratio	0.62	1.02	0.34	0.98	0.77	0.09	0.61	1.04	0.27	0.77	0.71	0.29
Control Delay	39.9	73.9	23.6	111.9	56.6	0.3	76.3	70.4	10.8	100.3	39.5	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.9	73.9	23.6	111.9	56.6	0.3	76.3	70.4	10.8	100.3	39.5	12.3
Queue Length 50th (m)	32.5	~127.5	24.3	48.5	99.8	0.0	25.9	~281.6	14.5	18.7	128.8	11.4
Queue Length 95th (m)	m35.4	m#198.5	m26.5	#79.2	118.8	0.0	38.6	#312.9	31.7	#33.3	141.2	35.2
Internal Link Dist (m)		653.2			318.6			323.5			163.2	
Turn Bay Length (m)	130.0		85.0	85.0		95.0	85.0		85.0	230.0		85.0
Base Capacity (vph)	450	1392	591	319	1149	515	296	2040	793	150	1868	760
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	0.62	1.02	0.34	0.98	0.76	0.09	0.58	1.04	0.27	0.77	0.71	0.29

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

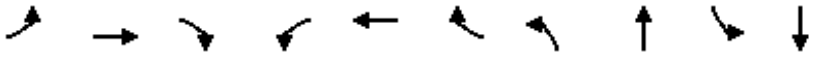
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	277	1416	198	312	871	44	173	2116	214	115	1324	224
Future Volume (vph)	277	1416	198	312	871	44	173	2116	214	115	1324	224
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3248	4520	1601	3471	4309	1555	3471	4520	1601	3471	4520	1555
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3248	4520	1601	3471	4309	1555	3471	4520	1601	3471	4520	1555
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	277	1416	198	312	871	44	173	2116	214	115	1324	224
RTOR Reduction (vph)	0	0	98	0	0	33	0	0	71	0	0	118
Lane Group Flow (vph)	277	1416	100	312	871	11	173	2116	143	115	1324	106
Heavy Vehicles (%)	9%	2%	2%	2%	7%	5%	2%	2%	2%	2%	2%	5%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	19.8	44.2	44.2	12.8	37.2	37.2	11.2	65.7	65.7	5.5	60.0	60.0
Effective Green, g (s)	20.8	46.2	46.2	13.8	39.2	39.2	12.2	67.7	67.7	6.5	62.0	62.0
Actuated g/C Ratio	0.14	0.31	0.31	0.09	0.26	0.26	0.08	0.45	0.45	0.04	0.41	0.41
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	5.0	5.0
Lane Grp Cap (vph)	450	1392	493	319	1126	406	282	2040	722	150	1868	642
v/s Ratio Prot	0.09	c0.31		c0.09	0.20		0.05	c0.47		0.03	c0.29	
v/s Ratio Perm			0.06			0.01			0.09			0.07
v/c Ratio	0.62	1.02	0.20	0.98	0.77	0.03	0.61	1.04	0.20	0.77	0.71	0.17
Uniform Delay, d1	60.8	51.9	38.3	67.9	51.3	41.2	66.6	41.1	24.8	71.0	36.5	27.7
Progression Factor	0.61	1.07	1.89	1.00	1.00	1.00	1.00	1.00	1.00	1.02	1.01	2.26
Incremental Delay, d2	1.0	19.8	0.4	43.9	5.2	0.1	3.9	30.3	0.1	19.3	1.5	0.2
Delay (s)	37.9	75.5	72.6	111.9	56.5	41.4	70.5	71.5	24.9	91.4	38.4	62.9
Level of Service	D	E	E	F	E	D	E	E	C	F	D	E
Approach Delay (s)		69.7			70.0			67.4			45.4	
Approach LOS		E			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	63.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	15.8
Intersection Capacity Utilization	96.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	161	1578	23	116	1158	93	22	143	139	28
v/c Ratio	0.44	0.58	0.02	0.44	0.47	0.10	0.08	0.34	0.75	0.08
Control Delay	8.4	14.4	0.0	14.0	13.8	3.4	27.7	10.5	57.3	14.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.4	14.4	0.0	14.0	13.8	3.4	27.7	10.5	57.3	14.3
Queue Length 50th (m)	6.8	67.8	0.0	4.8	45.3	0.0	3.2	4.1	22.9	1.1
Queue Length 95th (m)	16.7	111.5	0.0	19.4	77.2	8.0	8.5	16.9	39.0	7.0
Internal Link Dist (m)		318.6			344.0			313.0		312.0
Turn Bay Length (m)	85.0		85.0	85.0		85.0	85.0		85.0	
Base Capacity (vph)	369	2699	986	264	2455	944	587	782	416	740
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.58	0.02	0.44	0.47	0.10	0.04	0.18	0.33	0.04

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	161	1578	23	116	1158	93	22	29	114	139	8	20
Future Volume (vph)	161	1578	23	116	1158	93	22	29	114	139	8	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.6	5.6	3.5	5.6	5.6	3.6	2.6		3.6	2.6	
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	0.89	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1789	4520	1601	1789	4350	1601	1789	1658		1789	1682	
Flt Permitted	0.16	1.00	1.00	0.09	1.00	1.00	0.74	1.00		0.52	1.00	
Satd. Flow (perm)	294	4520	1601	161	4350	1601	1392	1658		987	1682	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	161	1578	23	116	1158	93	22	29	114	139	8	20
RTOR Reduction (vph)	0	0	10	0	0	41	0	91	0	0	16	0
Lane Group Flow (vph)	161	1578	13	116	1158	52	22	52	0	139	12	0
Heavy Vehicles (%)	2%	2%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	59.3	50.8	50.8	55.3	48.8	48.8	16.0	16.0		16.0	16.0	
Effective Green, g (s)	61.3	52.8	52.8	57.3	50.8	50.8	17.0	18.0		17.0	18.0	
Actuated g/C Ratio	0.68	0.59	0.59	0.64	0.56	0.56	0.19	0.20		0.19	0.20	
Clearance Time (s)	4.5	7.6	7.6	4.5	7.6	7.6	4.6	4.6		4.6	4.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	358	2651	939	238	2455	903	262	331		186	336	
v/s Ratio Prot	c0.05	c0.35		0.04	0.27			0.03			0.01	
v/s Ratio Perm	0.26		0.01	0.27		0.03	0.02			c0.14		
v/c Ratio	0.45	0.60	0.01	0.49	0.47	0.06	0.08	0.16		0.75	0.04	
Uniform Delay, d1	6.2	11.8	7.8	8.6	11.6	8.8	30.1	29.7		34.5	29.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	1.0	0.0	1.6	0.7	0.1	0.1	0.2		15.1	0.0	
Delay (s)	7.1	12.8	7.8	10.1	12.3	8.9	30.2	30.0		49.5	29.1	
Level of Service	A	B	A	B	B	A	C	C		D	C	
Approach Delay (s)		12.2			11.9			30.0			46.1	
Approach LOS		B			B			C			D	

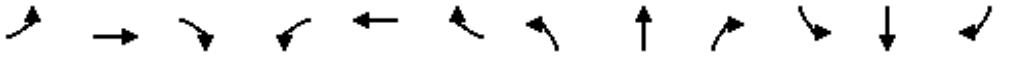
Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	11.7
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	230	1603	9	48	934	147	33	808	279	157	404
v/c Ratio	1.14	0.95	0.01	0.35	0.67	0.24	0.06	1.18	1.20	0.18	0.43
Control Delay	140.7	55.1	0.0	53.4	43.8	6.0	17.6	132.4	159.8	23.1	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	140.7	55.1	0.0	53.4	43.8	6.0	17.6	132.4	159.8	23.1	6.0
Queue Length 50th (m)	~59.2	182.2	0.0	9.1	93.0	0.0	4.4	~265.4	~77.9	26.1	9.8
Queue Length 95th (m)	#112.2	#221.6	0.0	18.4	111.0	15.0	10.0	#342.9	#134.4	41.1	32.3
Internal Link Dist (m)		344.0			620.6			300.4		386.3	
Turn Bay Length (m)	125.0		85.0	135.0		85.0	122.0				85.0
Base Capacity (vph)	201	1694	678	137	1401	615	569	686	232	863	935
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.14	0.95	0.01	0.35	0.67	0.24	0.06	1.18	1.20	0.18	0.43

Intersection Summary

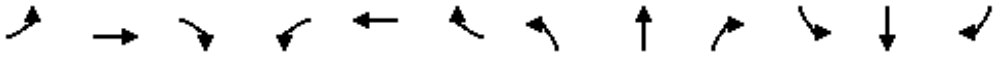
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	230	1603	9	48	934	147	33	604	204	279	157	404
Future Volume (vph)	230	1603	9	48	934	147	33	604	204	279	157	404
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	3.3		3.0	3.3	3.3
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1674	4520	1585	1789	4350	1601	1789	1736		1789	1830	1601
Flt Permitted	0.11	1.00	1.00	0.10	1.00	1.00	0.66	1.00		0.07	1.00	1.00
Satd. Flow (perm)	190	4520	1585	188	4350	1601	1238	1736		129	1830	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	230	1603	9	48	934	147	33	604	204	279	157	404
RTOR Reduction (vph)	0	0	6	0	0	101	0	8	0	0	0	181
Lane Group Flow (vph)	230	1603	3	48	934	46	33	800	0	279	157	223
Heavy Vehicles (%)	9%	2%	3%	2%	6%	2%	2%	8%	2%	2%	5%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	48.1	48.1	48.1	44.4	41.5	41.5	57.6	54.3		71.3	64.0	64.0
Effective Green, g (s)	49.1	50.1	50.1	45.4	43.5	43.5	59.6	56.3		72.3	66.0	66.0
Actuated g/C Ratio	0.35	0.36	0.36	0.32	0.31	0.31	0.43	0.40		0.52	0.47	0.47
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	6.9	4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0		3.0	5.0	5.0
Lane Grp Cap (vph)	193	1617	567	122	1351	497	543	698		232	862	754
v/s Ratio Prot	c0.10	0.35		0.02	c0.21		0.00	0.46		c0.12	0.09	
v/s Ratio Perm	c0.31		0.00	0.11		0.03	0.02			c0.50		0.14
v/c Ratio	1.19	0.99	0.01	0.39	0.69	0.09	0.06	1.15		1.20	0.18	0.30
Uniform Delay, d1	37.1	44.7	28.9	60.9	42.4	34.2	23.5	41.9		45.2	21.4	22.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	126.0	20.4	0.0	2.1	2.9	0.4	0.0	81.8		124.8	0.2	0.5
Delay (s)	163.0	65.2	28.9	63.0	45.3	34.6	23.6	123.6		170.0	21.6	23.2
Level of Service	F	E	C	E	D	C	C	F		F	C	C
Approach Delay (s)		77.2			44.6			119.7			71.7	
Approach LOS		E			D			F			E	

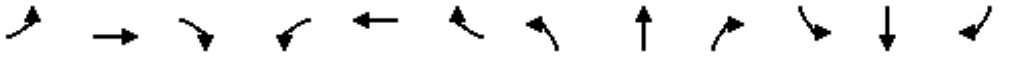
Intersection Summary			
HCM 2000 Control Delay	76.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.2
Intersection Capacity Utilization	108.9%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	191	1903	9	38	977	360	33	286	222	270	100	108
v/c Ratio	0.48	0.79	0.01	0.21	0.50	0.39	0.35	0.72	0.48	0.91	0.19	0.19
Control Delay	32.7	28.8	0.0	23.1	26.2	3.8	68.2	55.6	12.6	90.1	35.2	0.7
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	32.7	28.8	0.0	23.1	26.2	3.8	68.2	55.6	12.6	90.1	35.2	0.7
Queue Length 50th (m)	23.6	157.6	0.0	5.0	69.2	0.0	8.0	65.9	7.6	34.4	19.7	0.0
Queue Length 95th (m)	44.3	#229.4	0.0	12.6	94.6	18.3	18.9	88.2	27.6	#59.3	31.4	0.0
Internal Link Dist (m)		620.6			722.4			257.9			305.8	
Turn Bay Length (m)	85.0		85.0	85.0		85.0	120.0		85.0			85.0
Base Capacity (vph)	400	2395	893	181	1966	920	93	587	604	297	650	674
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	0.79	0.01	0.21	0.50	0.39	0.35	0.49	0.37	0.91	0.15	0.16

Intersection Summary

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



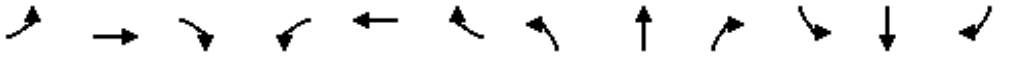
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	191	1903	9	38	977	360	33	286	222	270	100	108
Future Volume (vph)	191	1903	9	38	977	360	33	286	222	270	100	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.6	5.6	3.5	5.6	5.6	3.5	2.9	4.9	3.5	2.9	2.9
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	4520	1601	1789	4350	1601	1789	1883	1601	3471	1883	1601
Flt Permitted	0.22	1.00	1.00	0.09	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	415	4520	1601	164	4350	1601	1789	1883	1601	3471	1883	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	191	1903	9	38	977	360	33	286	222	270	100	108
RTOR Reduction (vph)	0	0	4	0	0	205	0	0	146	0	0	78
Lane Group Flow (vph)	191	1903	5	38	977	155	33	286	76	270	100	30
Heavy Vehicles (%)	2%	2%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	64.7	61.6	61.6	51.8	51.8	51.8	3.3	26.3	26.3	9.7	32.7	32.7
Effective Green, g (s)	65.7	63.6	63.6	52.8	53.8	53.8	4.3	28.3	26.3	10.7	34.7	34.7
Actuated g/C Ratio	0.53	0.51	0.51	0.42	0.43	0.43	0.03	0.23	0.21	0.09	0.28	0.28
Clearance Time (s)	4.5	7.6	7.6	4.5	7.6	7.6	4.5	4.9	4.9	4.5	4.9	4.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	401	2299	814	158	1872	689	61	426	336	297	522	444
v/s Ratio Prot	0.06	c0.42		0.01	c0.22		0.02	c0.15		c0.08	0.05	
v/s Ratio Perm	0.19		0.00	0.09		0.10			0.05			0.02
v/c Ratio	0.48	0.83	0.01	0.24	0.52	0.22	0.54	0.67	0.23	0.91	0.19	0.07
Uniform Delay, d1	28.0	26.1	15.1	28.5	26.2	22.5	59.4	44.1	40.9	56.7	34.4	33.2
Progression 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
Incremental Delay, d2	0.9	3.6	0.0	0.8	1.0	0.8	9.4	4.1	0.3	29.6	0.2	0.1
Delay (s)	28.8	29.6	15.1	29.3	27.2	23.2	68.8	48.2	41.3	86.2	34.6	33.3
Level of Service	C	C	B	C	C	C	E	D	D	F	C	C
Approach Delay (s)		29.5			26.2			46.6			63.5	
Approach LOS		C			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	34.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	78.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	119	2305	4	109	1278	453	100	428	249	284	9
v/c Ratio	0.49	0.87	0.00	0.78	0.52	0.43	0.90	0.65	0.94	0.42	0.02
Control Delay	20.7	31.5	0.0	86.0	21.7	5.8	129.9	58.9	108.8	54.0	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.7	31.5	0.0	86.0	21.7	5.8	129.9	58.9	108.8	54.0	0.1
Queue Length 50th (m)	14.4	232.0	0.0	17.4	93.0	13.5	30.1	60.8	38.6	39.4	0.0
Queue Length 95th (m)	26.1	285.9	0.0	#53.3	126.1	40.7	#66.1	75.2	#65.1	51.1	0.0
Internal Link Dist (m)		722.4			1030.1			436.1		413.0	
Turn Bay Length (m)	85.0		85.0	85.0		85.0	85.0		85.0		85.0
Base Capacity (vph)	254	2648	910	139	2449	1061	111	918	266	932	524
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.87	0.00	0.78	0.52	0.43	0.90	0.47	0.94	0.30	0.02

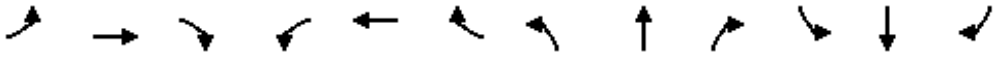
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	119	2305	4	109	1278	453	100	359	69	249	284	9
Future Volume (vph)	119	2305	4	109	1278	453	100	359	69	249	284	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.6	5.6	3.0	5.6	5.6	3.5	2.6		3.5	2.6	4.6
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	0.95		0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1789	4520	1484	1706	4309	1601	1690	3492		3471	3444	1601
Flt Permitted	0.12	1.00	1.00	0.05	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	217	4520	1484	90	4309	1601	1690	3492		3471	3444	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	119	2305	4	109	1278	453	100	359	69	249	284	9
RTOR Reduction (vph)	0	0	2	0	0	151	0	11	0	0	0	7
Lane Group Flow (vph)	119	2305	2	109	1278	302	100	417	0	249	284	2
Heavy Vehicles (%)	2%	2%	10%	7%	7%	2%	8%	2%	2%	2%	6%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6						4
Actuated Green, G (s)	85.9	85.9	85.9	86.9	83.3	83.3	8.9	25.9		10.5	27.5	27.5
Effective Green, g (s)	86.9	87.9	87.9	87.9	85.3	85.3	9.9	27.9		11.5	29.5	27.5
Actuated g/C Ratio	0.58	0.59	0.59	0.59	0.57	0.57	0.07	0.19		0.08	0.20	0.18
Clearance Time (s)	4.0	7.6	7.6	4.0	7.6	7.6	4.5	4.6		4.5	4.6	4.6
Vehicle Extension (s)	2.5	5.0	5.0	2.5	5.0	5.0	3.0	5.0		3.0	5.0	5.0
Lane Grp Cap (vph)	236	2648	869	138	2450	910	111	649		266	677	293
v/s Ratio Prot	0.04	c0.51		c0.04	0.30		0.06	c0.12		c0.07	0.08	
v/s Ratio Perm	0.26		0.00	0.42		0.19						0.00
v/c Ratio	0.50	0.87	0.00	0.79	0.52	0.33	0.90	0.64		0.94	0.42	0.01
Uniform Delay, d1	17.4	26.2	12.9	55.3	19.8	17.2	69.6	56.4		68.9	52.8	50.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.2	4.3	0.0	24.5	0.8	1.0	55.3	3.0		37.9	0.9	0.0
Delay (s)	18.7	30.5	12.9	79.8	20.6	18.2	124.9	59.4		106.8	53.6	50.1
Level of Service	B	C	B	E	C	B	F	E		F	D	D
Approach Delay (s)		29.9			23.5			71.8			78.0	
Approach LOS		C			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	36.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	14.7
Intersection Capacity Utilization	84.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

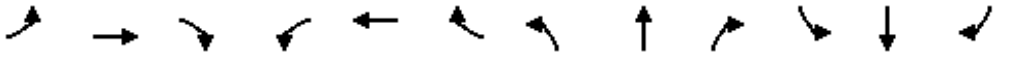


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	306	2160	313	222	1309	219	460	1460	430	531	1813	111
v/c Ratio	0.84	1.21	0.45	1.03	0.88	0.36	1.48	1.03	0.71	1.44	1.22	0.19
Control Delay	82.5	140.3	18.9	134.6	53.0	12.8	277.2	80.4	37.8	257.9	146.4	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.5	140.3	18.9	134.6	53.0	12.8	277.2	80.4	37.8	257.9	146.4	5.3
Queue Length 50th (m)	45.0	~315.1	34.2	~35.1	147.7	12.9	~93.5	~186.9	79.6	~106.4	~265.4	0.0
Queue Length 95th (m)	#66.8	#346.6	60.5	#62.1	170.9	33.8	#127.8	#220.7	120.1	#142.3	#298.4	11.3
Internal Link Dist (m)		309.3			173.0			421.7			476.7	
Turn Bay Length (m)	50.0		70.0	90.0		70.0	165.0		70.0	140.0		70.0
Base Capacity (vph)	372	1779	694	215	1487	613	310	1413	602	368	1486	581
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	0.82	1.21	0.45	1.03	0.88	0.36	1.48	1.03	0.71	1.44	1.22	0.19

Intersection Summary

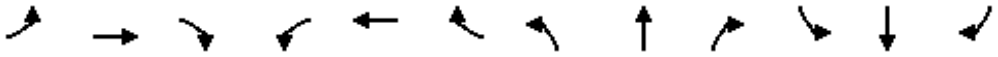
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	306	2160	313	222	1309	219	460	1460	430	531	1813	111
Future Volume (vph)	306	2160	313	222	1309	219	460	1460	430	531	1813	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3219	4520	1541	3471	4350	1498	3219	4350	1601	3340	4391	1484
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3219	4520	1541	3471	4350	1498	3219	4350	1601	3340	4391	1484
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	306	2160	313	222	1309	219	460	1460	430	531	1813	111
RTOR Reduction (vph)	0	0	88	0	0	101	0	0	82	0	0	73
Lane Group Flow (vph)	306	2160	225	222	1309	118	460	1460	348	531	1813	38
Heavy Vehicles (%)	10%	2%	6%	2%	6%	9%	10%	6%	2%	6%	5%	10%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	15.5	55.1	55.1	8.0	47.6	47.6	13.0	45.1	45.1	15.0	47.1	47.1
Effective Green, g (s)	16.5	57.1	57.1	9.0	49.6	49.6	14.0	47.1	47.1	16.0	49.1	49.1
Actuated g/C Ratio	0.11	0.39	0.39	0.06	0.34	0.34	0.10	0.32	0.32	0.11	0.34	0.34
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	366	1779	606	215	1488	512	310	1413	520	368	1486	502
v/s Ratio Prot	0.10	c0.48		c0.06	0.30		0.14	0.34		c0.16	c0.41	
v/s Ratio Perm			0.15			0.08			0.22			0.03
v/c Ratio	0.84	1.21	0.37	1.03	0.88	0.23	1.48	1.03	0.67	1.44	1.22	0.07
Uniform Delay, d1	62.9	44.0	31.2	68.0	44.9	34.1	65.5	49.0	42.2	64.5	48.0	32.5
Progression 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
Incremental Delay, d2	15.1	101.8	0.5	70.1	6.5	0.3	234.3	32.9	6.7	214.2	105.3	0.3
Delay (s)	78.1	145.8	31.7	138.1	51.4	34.4	299.8	81.9	48.9	278.7	153.3	32.8
Level of Service	E	F	C	F	D	C	F	F	D	F	F	C
Approach Delay (s)		125.5			60.2			118.5			175.0	
Approach LOS		F			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	124.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.23		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	15.8
Intersection Capacity Utilization	111.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

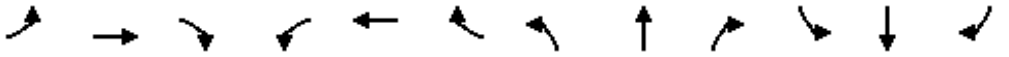


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	334	942	502	254	593	74	314	2071	243	86	1261	198
v/c Ratio	0.69	0.79	0.76	0.78	0.58	0.13	0.94	1.12	0.33	0.42	0.78	0.29
Control Delay	66.6	48.9	32.7	81.0	46.7	0.5	100.7	99.8	14.6	72.7	45.6	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.6	48.9	32.7	81.0	46.7	0.5	100.7	99.8	14.6	72.7	45.6	8.9
Queue Length 50th (m)	47.7	128.3	80.8	37.3	76.5	0.0	46.9	~291.9	19.8	12.3	134.2	5.8
Queue Length 95th (m)	61.8	143.1	116.6	#55.8	94.3	0.0	#75.6	#335.5	42.5	21.9	167.0	25.0
Internal Link Dist (m)		214.6			322.8			284.8			465.5	
Turn Bay Length (m)	85.0		140.0	85.0		85.0	85.0		85.0	85.0		85.0
Base Capacity (vph)	711	1362	732	330	1031	583	333	1856	737	203	1622	680
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	0.69	0.69	0.77	0.58	0.13	0.94	1.12	0.33	0.42	0.78	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.



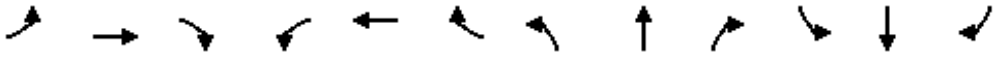
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	334	942	502	254	593	74	314	2071	243	86	1261	198
Future Volume (vph)	334	942	502	254	593	74	314	2071	243	86	1261	198
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.2	4.2	3.0	4.2	4.2	3.0	4.9	4.9	3.0	4.9	4.9
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3437	3579	1601	3471	3579	1601	3219	4520	1601	3471	4433	1570
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3437	3579	1601	3471	3579	1601	3219	4520	1601	3471	4433	1570
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	334	942	502	254	593	74	314	2071	243	86	1261	198
RTOR Reduction (vph)	0	0	132	0	0	53	0	0	80	0	0	106
Lane Group Flow (vph)	334	942	370	254	593	21	314	2071	163	86	1261	92
Heavy Vehicles (%)	3%	2%	2%	2%	2%	2%	10%	2%	2%	2%	4%	4%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	19.5	46.2	46.2	12.6	39.3	39.3	14.0	57.6	57.6	7.5	51.1	51.1
Effective Green, g (s)	20.5	48.2	48.2	13.6	41.3	41.3	15.0	59.6	59.6	8.5	53.1	53.1
Actuated g/C Ratio	0.14	0.33	0.33	0.09	0.28	0.28	0.10	0.41	0.41	0.06	0.37	0.37
Clearance Time (s)	4.0	6.2	6.2	4.0	6.2	6.2	4.0	6.9	6.9	4.0	6.9	6.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	485	1189	532	325	1019	456	333	1857	658	203	1623	574
v/s Ratio Prot	c0.10	c0.26		c0.07	0.17		0.10	c0.46		0.02	c0.28	
v/s Ratio Perm			0.23			0.01			0.10			0.06
v/c Ratio	0.69	0.79	0.70	0.78	0.58	0.05	0.94	1.12	0.25	0.42	0.78	0.16
Uniform Delay, d1	59.2	43.9	42.0	64.2	44.4	37.6	64.6	42.7	28.0	65.9	40.7	30.9
Progression 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
Incremental Delay, d2	4.1	3.7	3.9	11.6	0.9	0.0	35.3	60.0	0.9	1.4	3.7	0.6
Delay (s)	63.3	47.6	46.0	75.8	45.3	37.6	99.9	102.7	28.9	67.3	44.4	31.5
Level of Service	E	D	D	E	D	D	F	F	C	E	D	C
Approach Delay (s)		50.1			53.1			95.5			44.1	
Approach LOS		D			D			F			D	

Intersection Summary			
HCM 2000 Control Delay	66.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	15.1
Intersection Capacity Utilization	91.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	223	2404	2	235	1783
v/c Ratio	0.04	0.75	0.80	0.00	0.73	0.47
Control Delay	56.6	38.2	7.2	0.0	55.6	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.6	38.2	7.2	0.0	55.6	4.1
Queue Length 50th (m)	1.4	22.5	8.9	0.0	50.3	45.7
Queue Length 95th (m)	5.4	48.8	65.0	m0.0	79.1	79.5
Internal Link Dist (m)		261.1	423.7			314.4
Turn Bay Length (m)	85.0			85.0	85.0	
Base Capacity (vph)	361	523	3009	1091	325	3797
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	0.01	0.43	0.80	0.00	0.72	0.47

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	5	0	223	0	2404	2	235	1783	0
Future Volume (vph)	0	0	0	5	0	223	0	2404	2	235	1783	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				3.6	2.6			5.6	5.6	3.5	5.6	
Lane Util. Factor				1.00	1.00			*0.80	1.00	1.00	*0.80	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1789	1601			4520	1601	1789	4520	
Flt Permitted				0.76	1.00			1.00	1.00	0.04	1.00	
Satd. Flow (perm)				1426	1601			4520	1601	74	4520	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	5	0	223	0	2404	2	235	1783	0
RTOR Reduction (vph)	0	0	0	0	130	0	0	0	1	0	0	0
Lane Group Flow (vph)	0	0	0	5	93	0	0	2404	1	235	1783	0
Turn Type	Perm			Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)				13.8	13.8			97.8	97.8	124.0	124.0	
Effective Green, g (s)				14.8	15.8			99.8	99.8	125.0	126.0	
Actuated g/C Ratio				0.10	0.11			0.67	0.67	0.83	0.84	
Clearance Time (s)				4.6	4.6			7.6	7.6	4.5	7.6	
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				140	168			3007	1065	321	3796	
v/s Ratio Prot					c0.06			c0.53		c0.11	0.39	
v/s Ratio Perm				0.00					0.00	0.50		
v/c Ratio				0.04	0.56			0.80	0.00	0.73	0.47	
Uniform Delay, d1				61.1	63.8			17.9	8.4	48.8	3.2	
Progression Factor				1.00	1.00			0.26	1.00	1.00	1.00	
Incremental Delay, d2				0.1	3.9			1.5	0.0	8.3	0.4	
Delay (s)				61.3	67.7			6.1	8.4	57.2	3.6	
Level of Service				E	E			A	A	E	A	
Approach Delay (s)		0.0			67.6			6.1			9.8	
Approach LOS		A			E			A			A	

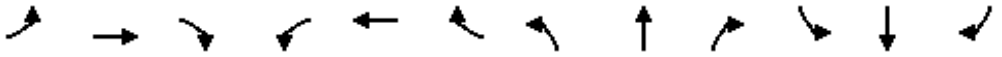
Intersection Summary			
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	11.7
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	122	147	2259	171	248	1540
v/c Ratio	0.67	0.42	0.80	0.16	0.74	0.42
Control Delay	79.4	9.9	41.2	9.0	67.9	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	79.4	9.9	41.2	9.0	67.9	4.6
Queue Length 50th (m)	35.2	0.0	297.3	14.0	63.8	46.0
Queue Length 95th (m)	54.5	16.4	m290.3	m22.1	94.3	59.4
Internal Link Dist (m)		265.7	219.0			423.7
Turn Bay Length (m)	85.0			85.0	85.0	
Base Capacity (vph)	361	532	2838	1048	340	3664
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	0.34	0.28	0.80	0.16	0.73	0.42

Intersection Summary

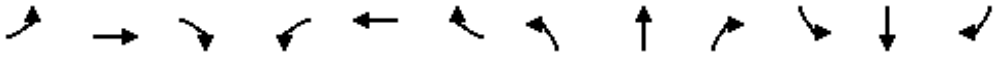
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	122	0	147	0	2259	171	248	1540	0
Future Volume (vph)	0	0	0	122	0	147	0	2259	171	248	1540	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				3.6	2.6			5.6	5.6	3.5	5.6	
Lane Util. Factor				1.00	1.00			*0.80	1.00	1.00	*0.80	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1789	1601			4520	1601	1789	4520	
Flt Permitted				0.76	1.00			1.00	1.00	0.04	1.00	
Satd. Flow (perm)				1426	1601			4520	1601	78	4520	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	122	0	147	0	2259	171	248	1540	0
RTOR Reduction (vph)	0	0	0	0	127	0	0	0	43	0	0	0
Lane Group Flow (vph)	0	0	0	122	20	0	0	2259	128	248	1540	0
Turn Type	Perm			Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)				18.2	18.2			92.2	92.2	119.6	119.6	
Effective Green, g (s)				19.2	20.2			94.2	94.2	120.6	121.6	
Actuated g/C Ratio				0.13	0.13			0.63	0.63	0.80	0.81	
Clearance Time (s)				4.6	4.6			7.6	7.6	4.5	7.6	
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				182	215			2838	1005	335	3664	
v/s Ratio Prot					0.01			c0.50		c0.12	0.34	
v/s Ratio Perm				c0.09					0.08	0.48		
v/c Ratio				0.67	0.09			0.80	0.13	0.74	0.42	
Uniform Delay, d1				62.4	56.9			20.8	11.3	48.2	4.1	
Progression Factor				1.00	1.00			1.80	1.72	1.33	0.96	
Incremental Delay, d2				9.3	0.2			0.7	0.1	7.7	0.3	
Delay (s)				71.7	57.1			38.1	19.5	71.8	4.2	
Level of Service				E	E			D	B	E	A	
Approach Delay (s)		0.0			63.7			36.8			13.6	
Approach LOS		A			E			D			B	

Intersection Summary			
HCM 2000 Control Delay	29.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	11.7
Intersection Capacity Utilization	77.8%	ICU Level of Service	D
Analysis Period (min)	15		

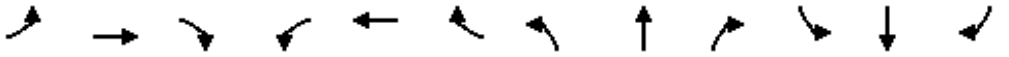
c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	289	247	107	222	27	32	46	2181	352	53	1679	61
v/c Ratio	0.82	0.72	0.30	1.07	0.08	0.09	0.27	0.81	0.34	0.34	0.62	0.06
Control Delay	65.7	65.0	10.4	125.3	44.5	0.5	12.8	27.0	6.1	16.7	20.9	1.7
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	65.7	65.0	10.4	125.3	44.5	0.5	12.8	27.0	6.1	16.7	20.9	1.7
Queue Length 50th (m)	69.8	65.0	0.2	51.3	6.2	0.0	3.9	195.2	13.1	4.5	123.2	0.0
Queue Length 95th (m)	92.5	88.3	15.4	#70.3	13.8	0.0	9.7	258.8	35.3	13.0	164.7	4.0
Internal Link Dist (m)		189.2			233.6			642.4			323.5	
Turn Bay Length (m)	85.0		85.0	85.0		85.0	85.0		85.0	85.0		85.0
Base Capacity (vph)	354	524	501	208	535	509	171	2688	1050	158	2695	988
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	0.82	0.47	0.21	1.07	0.05	0.06	0.27	0.81	0.34	0.34	0.62	0.06

Intersection Summary

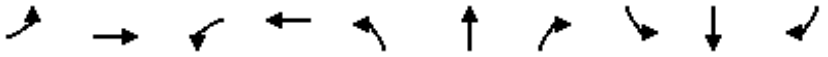
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	289	247	107	222	27	32	46	2181	352	53	1679	61
Future Volume (vph)	289	247	107	222	27	32	46	2181	352	53	1679	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	2.6	4.6	3.5	2.6	4.6	3.5	5.6	5.6	3.5	5.6	5.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	1883	1601	1789	1883	1601	1789	4520	1601	1789	4520	1601
Flt Permitted	0.64	1.00	1.00	0.28	1.00	1.00	0.06	1.00	1.00	0.05	1.00	1.00
Satd. Flow (perm)	1203	1883	1601	525	1883	1601	120	4520	1601	93	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	289	247	107	222	27	32	46	2181	352	53	1679	61
RTOR Reduction (vph)	0	0	87	0	0	27	0	0	101	0	0	25
Lane Group Flow (vph)	289	247	20	222	27	5	46	2181	251	53	1679	36
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	37.0	24.6	24.6	30.0	21.1	21.1	85.0	79.4	79.4	85.6	79.7	79.7
Effective Green, g (s)	39.0	26.6	24.6	32.0	23.1	21.1	87.0	81.4	81.4	87.6	81.7	81.7
Actuated g/C Ratio	0.28	0.19	0.18	0.23	0.17	0.15	0.62	0.58	0.58	0.63	0.58	0.58
Clearance Time (s)	4.5	4.6	4.6	4.5	4.6	4.6	4.5	7.6	7.6	4.5	7.6	7.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	391	357	281	209	310	241	153	2628	930	141	2637	934
v/s Ratio Prot	c0.07	0.13		c0.07	0.01		0.01	c0.48		c0.02	0.37	
v/s Ratio Perm	0.14		0.01	c0.17		0.00	0.17		0.16	0.21		0.02
v/c Ratio	0.74	0.69	0.07	1.06	0.09	0.02	0.30	0.83	0.27	0.38	0.64	0.04
Uniform Delay, d1	44.7	52.9	48.2	51.6	49.5	50.6	14.8	23.7	14.5	23.1	19.3	12.4
Progression 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
Incremental Delay, d2	7.2	5.7	0.1	79.7	0.1	0.0	1.1	3.2	0.7	1.7	1.2	0.1
Delay (s)	51.9	58.6	48.3	131.3	49.6	50.7	15.9	26.9	15.3	24.8	20.5	12.5
Level of Service	D	E	D	F	D	D	B	C	B	C	C	B
Approach Delay (s)		53.9			114.3			25.1			20.4	
Approach LOS		D			F			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.2
Intersection Capacity Utilization	80.7%	ICU Level of Service	D
Analysis Period (min)	15		

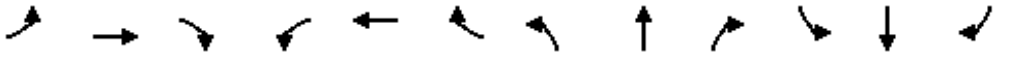
c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	195	442	10	129	176	2279	6	99	1850	36
v/c Ratio	0.72	0.87	0.16	0.26	0.76	0.86	0.01	0.60	0.74	0.04
Control Delay	57.3	49.5	42.1	13.0	48.2	26.2	0.0	34.8	24.8	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.3	49.5	42.1	13.0	48.2	26.2	0.0	34.8	24.8	0.1
Queue Length 50th (m)	43.2	77.0	1.9	6.6	25.7	188.3	0.0	7.6	145.5	0.0
Queue Length 95th (m)	69.8	118.9	6.9	21.5	#59.7	237.1	0.0	#31.6	182.5	0.0
Internal Link Dist (m)		265.1		307.9		467.3			642.4	
Turn Bay Length (m)	85.0		85.0		85.0		85.0	85.0		85.0
Base Capacity (vph)	336	595	75	576	253	2665	964	164	2489	921
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.74	0.13	0.22	0.70	0.86	0.01	0.60	0.74	0.04

Intersection Summary

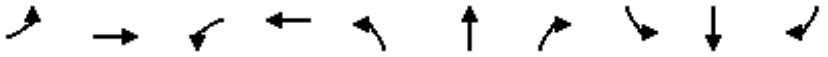
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	195	18	424	10	7	122	176	2279	6	99	1850	36
Future Volume (vph)	195	18	424	10	7	122	176	2279	6	99	1850	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.6	2.6		3.6	2.6		3.5	5.6	5.6	3.5	5.6	5.6
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	0.86		1.00	0.86		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	1612		1789	1616		1789	4520	1601	1789	4520	1601
Flt Permitted	0.58	1.00		0.13	1.00		0.06	1.00	1.00	0.06	1.00	1.00
Satd. Flow (perm)	1088	1612		244	1616		107	4520	1601	113	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	195	18	424	10	7	122	176	2279	6	99	1850	36
RTOR Reduction (vph)	0	90	0	0	69	0	0	0	2	0	0	16
Lane Group Flow (vph)	195	352	0	10	60	0	176	2279	4	99	1850	20
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	29.9	29.9		29.9	29.9		81.0	70.6	70.6	71.7	65.8	65.8
Effective Green, g (s)	30.9	31.9		30.9	31.9		82.0	72.6	72.6	73.7	67.8	67.8
Actuated g/C Ratio	0.25	0.26		0.25	0.26		0.67	0.59	0.59	0.60	0.55	0.55
Clearance Time (s)	4.6	4.6		4.6	4.6		4.5	7.6	7.6	4.5	7.6	7.6
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	273	417		61	418		231	2665	944	161	2489	881
v/s Ratio Prot		c0.22			0.04		c0.07	c0.50		0.03	0.41	
v/s Ratio Perm	0.18			0.04			0.43		0.00	0.33		0.01
v/c Ratio	0.71	0.84		0.16	0.14		0.76	0.86	0.00	0.61	0.74	0.02
Uniform Delay, d1	42.1	43.2		36.0	35.1		32.8	20.9	10.4	22.3	21.0	12.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.6	14.4		1.3	0.2		13.8	3.8	0.0	6.8	2.1	0.0
Delay (s)	50.6	57.6		37.3	35.2		46.6	24.7	10.4	29.1	23.1	12.6
Level of Service	D	E		D	D		D	C	B	C	C	B
Approach Delay (s)		55.5			35.4			26.2			23.2	
Approach LOS		E			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	123.1	Sum of lost time (s)	11.7
Intersection Capacity Utilization	95.5%	ICU Level of Service	F
Analysis Period (min)	15		

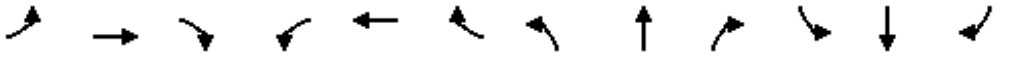
c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	281	182	259	82	124	2099	22	125	2151	9
v/c Ratio	0.74	0.33	0.89	0.15	0.68	0.89	0.03	0.69	0.91	0.01
Control Delay	44.8	13.8	65.0	6.3	34.9	29.2	0.0	35.5	30.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.8	13.8	65.0	6.3	34.9	29.2	0.0	35.5	30.9	0.0
Queue Length 50th (m)	50.1	12.0	48.8	0.1	9.4	154.6	0.0	9.4	161.8	0.0
Queue Length 95th (m)	79.4	28.2	#88.4	9.9	#37.9	#220.5	0.0	#38.3	#230.0	0.0
Internal Link Dist (m)		318.3		354.6		485.6			467.3	
Turn Bay Length (m)	85.0		85.0		85.0		85.0	85.0		85.0
Base Capacity (vph)	479	674	369	663	182	2359	864	182	2359	864
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.27	0.70	0.12	0.68	0.89	0.03	0.69	0.91	0.01

Intersection Summary

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



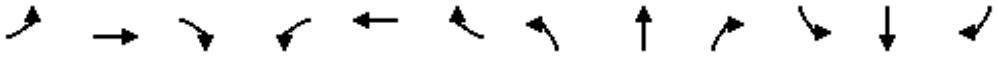
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	281	3	179	259	1	81	124	2099	22	125	2151	9
Future Volume (vph)	281	3	179	259	1	81	124	2099	22	125	2151	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.6	2.6		3.6	2.6		3.5	5.6	5.6	3.5	5.6	5.6
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	0.85		1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	1606		1789	1604		1789	4520	1601	1789	4520	1601
Flt Permitted	0.69	1.00		0.53	1.00		0.08	1.00	1.00	0.08	1.00	1.00
Satd. Flow (perm)	1290	1606		994	1604		143	4520	1601	143	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	281	3	179	259	1	81	124	2099	22	125	2151	9
RTOR Reduction (vph)	0	69	0	0	56	0	0	0	11	0	0	4
Lane Group Flow (vph)	281	113	0	259	26	0	124	2099	11	125	2151	5
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	29.3	29.3		29.3	29.3		56.6	51.6	51.6	56.6	51.6	51.6
Effective Green, g (s)	30.3	31.3		30.3	31.3		58.6	53.6	53.6	58.6	53.6	53.6
Actuated g/C Ratio	0.30	0.31		0.30	0.31		0.57	0.52	0.52	0.57	0.52	0.52
Clearance Time (s)	4.6	4.6		4.6	4.6		4.5	7.6	7.6	4.5	7.6	7.6
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	380	489		293	489		177	2361	836	177	2361	836
v/s Ratio Prot		0.07			0.02		0.04	0.46		c0.04	c0.48	
v/s Ratio Perm	0.22			c0.26			0.36		0.01	0.36		0.00
v/c Ratio	0.74	0.23		0.88	0.05		0.70	0.89	0.01	0.71	0.91	0.01
Uniform Delay, d1	32.6	26.7		34.5	25.2		20.8	21.8	11.8	20.2	22.3	11.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.4	0.2		25.4	0.0		11.8	5.5	0.0	12.1	6.7	0.0
Delay (s)	40.0	26.9		59.9	25.2		32.6	27.3	11.8	32.3	29.0	11.7
Level of Service	D	C		E	C		C	C	B	C	C	B
Approach Delay (s)		34.8			51.6			27.5			29.1	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	102.6	Sum of lost time (s)	11.7
Intersection Capacity Utilization	88.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	127	46	46	76	2175	8	14	2602
v/c Ratio	0.52	0.64	0.19	0.44	0.61	0.01	0.08	0.78
Control Delay	26.7	80.7	5.0	18.1	6.2	0.0	3.0	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.7	80.7	5.0	18.1	6.2	0.0	3.0	11.9
Queue Length 50th (m)	9.5	8.9	0.0	2.0	50.6	0.0	0.4	125.3
Queue Length 95th (m)	26.8	21.1	4.4	15.3	120.6	0.0	1.6	176.6
Internal Link Dist (m)	271.9		333.5		436.2			485.6
Turn Bay Length (m)		85.0		85.0		85.0	85.0	
Base Capacity (vph)	649	260	649	173	3576	1277	175	3325
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.18	0.07	0.44	0.61	0.01	0.08	0.78

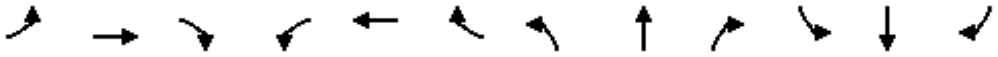
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	127	46	0	46	76	2175	8	14	2602	0
Future Volume (vph)	0	0	127	46	0	46	76	2175	8	14	2602	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		2.6		3.6	2.6		3.5	5.6	5.6	3.5	5.6	
Lane Util. Factor		1.00		1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	
Frt		0.85		1.00	0.85		1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1601		1789	1601		1789	4520	1601	1789	4520	
Flt Permitted		1.00		0.38	1.00		0.05	1.00	1.00	0.05	1.00	
Satd. Flow (perm)		1601		712	1601		93	4520	1601	96	4520	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	127	46	0	46	76	2175	8	14	2602	0
RTOR Reduction (vph)	0	68	0	0	41	0	0	0	2	0	0	0
Lane Group Flow (vph)	0	59	0	46	5	0	76	2175	6	14	2602	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		9.6		9.6	9.6		84.1	80.1	80.1	78.1	77.1	
Effective Green, g (s)		11.6		10.6	11.6		86.1	82.1	82.1	80.1	79.1	
Actuated g/C Ratio		0.11		0.10	0.11		0.80	0.76	0.76	0.75	0.74	
Clearance Time (s)		4.6		4.6	4.6		4.5	7.6	7.6	4.5	7.6	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		172		70	172		153	3455	1223	103	3328	
v/s Ratio Prot		0.04			0.00		c0.02	0.48		0.00	c0.58	
v/s Ratio Perm				c0.06			0.37		0.00	0.10		
v/c Ratio		0.34		0.66	0.03		0.50	0.63	0.01	0.14	0.78	
Uniform Delay, d1		44.4		46.6	42.9		15.0	5.7	3.0	5.0	8.8	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.2		20.1	0.1		2.5	0.9	0.0	0.6	1.9	
Delay (s)		45.6		66.7	42.9		17.6	6.6	3.0	5.6	10.7	
Level of Service		D		E	D		B	A	A	A	B	
Approach Delay (s)		45.6			54.8			7.0			10.7	
Approach LOS		D			D			A			B	

Intersection Summary			
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	107.4	Sum of lost time (s)	11.7
Intersection Capacity Utilization	81.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

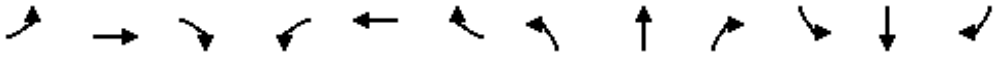


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	127	27	562	20	2	155	41	1978	61	133	2583	59
v/c Ratio	0.27	0.04	1.00	0.04	0.00	0.27	0.33	0.83	0.07	0.83	1.02	0.06
Control Delay	39.0	34.0	82.1	34.8	33.0	21.2	18.7	34.2	6.7	68.2	57.0	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.0	34.0	82.1	34.8	33.0	21.2	18.7	34.2	6.7	68.2	57.0	6.2
Queue Length 50th (m)	27.8	5.4	152.4	4.1	0.4	17.7	4.5	202.0	2.1	23.3	~346.6	2.0
Queue Length 95th (m)	45.4	12.7	#231.0	10.4	2.4	36.2	9.4	225.6	9.5	#59.5	#375.1	8.9
Internal Link Dist (m)		291.2			376.2			390.5			436.2	
Turn Bay Length (m)	85.0		85.0	85.0		85.0	85.0		85.0	85.0		85.0
Base Capacity (vph)	469	632	562	459	632	565	123	2371	861	161	2524	914
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	0.27	0.04	1.00	0.04	0.00	0.27	0.33	0.83	0.07	0.83	1.02	0.06

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

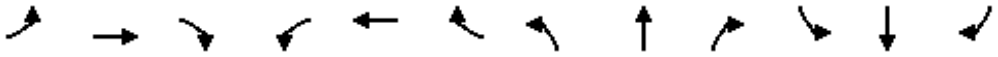
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	127	27	562	20	2	155	41	1978	61	133	2583	59
Future Volume (vph)	127	27	562	20	2	155	41	1978	61	133	2583	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.6	2.6	4.6	3.6	2.6	4.6	3.5	5.6	5.6	3.5	5.6	5.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	1883	1601	1789	1883	1601	1789	4520	1601	1789	4520	1601
Flt Permitted	0.76	1.00	1.00	0.74	1.00	1.00	0.05	1.00	1.00	0.05	1.00	1.00
Satd. Flow (perm)	1425	1883	1601	1393	1883	1601	96	4520	1601	92	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	127	27	562	20	2	155	41	1978	61	133	2583	59
RTOR Reduction (vph)	0	0	46	0	0	49	0	0	22	0	0	20
Lane Group Flow (vph)	127	27	516	20	2	106	41	1978	39	133	2583	39
Turn Type	Perm	NA	Perm	Perm	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	48.4	48.4	48.4	48.4	48.4	48.4	81.6	77.6	77.6	90.0	81.8	81.8
Effective Green, g (s)	49.4	50.4	48.4	49.4	50.4	48.4	83.6	79.6	79.6	91.3	83.8	83.8
Actuated g/C Ratio	0.33	0.33	0.32	0.33	0.33	0.32	0.55	0.53	0.53	0.61	0.56	0.56
Clearance Time (s)	4.6	4.6	4.6	4.6	4.6	4.6	4.5	7.6	7.6	4.5	7.6	7.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	466	628	513	456	628	513	109	2384	844	159	2510	889
v/s Ratio Prot		0.01			0.00		0.01	0.44		c0.05	c0.57	
v/s Ratio Perm	0.09		c0.32	0.01		0.07	0.20		0.02	0.46		0.02
v/c Ratio	0.27	0.04	1.01	0.04	0.00	0.21	0.38	0.83	0.05	0.84	1.03	0.04
Uniform Delay, d1	37.5	34.0	51.2	34.6	33.5	37.3	34.2	30.0	17.3	41.6	33.6	15.3
Progression 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
Incremental Delay, d2	0.3	0.0	41.1	0.0	0.0	0.2	2.2	3.5	0.1	30.0	25.9	0.1
Delay (s)	37.8	34.0	92.3	34.7	33.5	37.5	36.4	33.5	17.4	71.5	59.5	15.4
Level of Service	D	C	F	C	C	D	D	C	B	E	E	B
Approach Delay (s)		80.5			37.1			33.1			59.1	
Approach LOS		F			D			C			E	

Intersection Summary			
HCM 2000 Control Delay	51.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	150.9	Sum of lost time (s)	11.7
Intersection Capacity Utilization	100.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

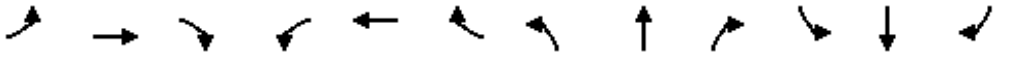


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	39	2182	373	222	1178	637	393	1506	1090	186	919	93
v/c Ratio	0.19	1.17	0.49	0.73	0.59	0.68	1.46	1.09	1.43	0.93	0.71	0.18
Control Delay	62.9	120.1	18.2	74.3	29.2	23.3	268.8	94.9	231.9	109.2	46.1	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.9	120.1	18.2	74.3	29.2	23.3	268.8	94.9	231.9	109.2	46.1	6.4
Queue Length 50th (m)	5.2	~288.4	39.7	30.2	98.7	107.1	~73.6	~187.5	~384.8	25.9	91.2	0.0
Queue Length 95th (m)	11.1	#320.5	68.1	#45.9	116.0	152.4	#105.5	#221.1	#465.1	#48.8	109.5	11.4
Internal Link Dist (m)		1711.9			759.7			657.0			690.8	
Turn Bay Length (m)	130.0		110.0	300.0		70.0	110.0		70.0	130.0		85.0
Base Capacity (vph)	201	1861	755	305	1991	936	269	1385	760	201	1288	510
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	0.19	1.17	0.49	0.73	0.59	0.68	1.46	1.09	1.43	0.93	0.71	0.18

Intersection Summary

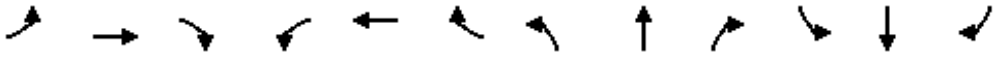
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	2182	373	222	1178	637	393	1506	1090	186	919	93
Future Volume (vph)	39	2182	373	222	1178	637	393	1506	1090	186	919	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.4	5.4	3.0	5.4	2.0	3.0	5.0	2.0	3.0	5.0	5.0
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3404	4520	1601	3437	4350	1601	3309	4350	1601	3404	4350	1484
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3404	4520	1601	3437	4350	1601	3309	4350	1601	3404	4350	1484
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	39	2182	373	222	1178	637	393	1506	1090	186	919	93
RTOR Reduction (vph)	0	0	96	0	0	36	0	0	40	0	0	65
Lane Group Flow (vph)	39	2182	277	222	1178	601	393	1506	1050	186	919	28
Heavy Vehicles (%)	4%	2%	2%	3%	6%	2%	7%	6%	2%	4%	6%	10%
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6	7	3	8	1	7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	5.6	53.6	53.6	11.0	59.0	66.0	10.0	41.0	52.0	7.0	38.0	38.0
Effective Green, g (s)	6.6	55.6	55.6	12.0	61.0	70.0	11.0	43.0	56.0	8.0	40.0	40.0
Actuated g/C Ratio	0.05	0.41	0.41	0.09	0.45	0.52	0.08	0.32	0.41	0.06	0.30	0.30
Clearance Time (s)	4.0	7.4	7.4	4.0	7.4	4.0	4.0	7.0	4.0	4.0	7.0	7.0
Vehicle Extension (s)	5.0	3.0	3.0	5.0	3.0	4.0	4.0	5.0	5.0	4.0	5.0	5.0
Lane Grp Cap (vph)	166	1861	659	305	1965	830	269	1385	664	201	1288	439
v/s Ratio Prot	0.01	c0.48		0.06	0.27	0.05	c0.12	0.35	c0.15	0.05	0.21	
v/s Ratio Perm			0.17			0.33			0.50			0.02
v/c Ratio	0.23	1.17	0.42	0.73	0.60	0.72	1.46	1.09	1.58	0.93	0.71	0.06
Uniform Delay, d1	61.8	39.7	28.2	59.9	27.8	25.1	62.0	46.0	39.5	63.2	42.4	34.1
Progression 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
Incremental Delay, d2	1.5	83.7	2.0	10.2	1.4	3.4	226.8	51.6	268.9	43.2	3.4	0.3
Delay (s)	63.3	123.4	30.2	70.1	29.2	28.4	288.8	97.6	308.4	106.4	45.8	34.3
Level of Service	E	F	C	E	C	C	F	F	F	F	D	C
Approach Delay (s)		109.1			33.4			199.6			54.3	
Approach LOS		F			C			F			D	

Intersection Summary			
HCM 2000 Control Delay	114.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.39		
Actuated Cycle Length (s)	135.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	126.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

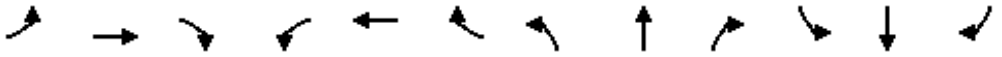


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	117	221	237	317	43	65	68	1580	215	313	2443	164
v/c Ratio	0.35	0.38	0.71	1.19	0.07	0.20	0.47	0.74	0.26	0.85	0.88	0.17
Control Delay	42.7	50.4	36.5	158.0	45.0	1.3	29.3	31.8	9.7	58.6	26.7	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.7	50.4	36.5	158.0	45.0	1.3	29.3	31.8	9.7	58.6	26.7	6.5
Queue Length 50th (m)	24.7	27.4	27.8	~86.4	5.0	0.0	4.7	137.7	11.3	60.7	210.2	7.6
Queue Length 95th (m)	40.7	39.4	56.1	#133.0	10.3	0.0	19.2	188.7	31.2	#117.5	#321.1	20.8
Internal Link Dist (m)		1074.9			770.5			396.6			272.1	
Turn Bay Length (m)	85.0		85.0	120.0		85.0	170.0		70.0	170.0		70.0
Base Capacity (vph)	331	1073	524	267	1095	524	146	2129	839	412	2776	961
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	0.35	0.21	0.45	1.19	0.04	0.12	0.47	0.74	0.26	0.76	0.88	0.17

Intersection Summary

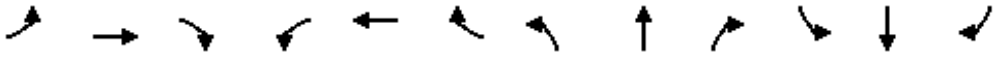
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	117	221	237	317	43	65	68	1580	215	313	2443	164
Future Volume (vph)	117	221	237	317	43	65	68	1580	215	313	2443	164
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.5	3.2	5.2	3.0	3.2	5.2	3.0	5.8	5.8	3.0	5.8	5.8
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	3579	1526	1789	3544	1484	1755	4433	1601	1722	4433	1484
Flt Permitted	0.65	1.00	1.00	0.56	1.00	1.00	0.06	1.00	1.00	0.06	1.00	1.00
Satd. Flow (perm)	1216	3579	1526	1062	3544	1484	118	4433	1601	110	4433	1484
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	117	221	237	317	43	65	68	1580	215	313	2443	164
RTOR Reduction (vph)	0	0	106	0	0	56	0	0	70	0	0	33
Lane Group Flow (vph)	117	221	131	317	43	9	68	1580	145	313	2443	131
Heavy Vehicles (%)	2%	2%	7%	2%	3%	10%	4%	4%	2%	6%	4%	10%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	8		3	4		5	2		1	6	
Permitted Phases	8		8	4		4	2		2	6		6
Actuated Green, G (s)	30.0	20.6	20.6	24.7	17.7	17.7	66.0	61.7	61.7	88.2	79.9	79.9
Effective Green, g (s)	33.6	22.6	20.6	26.7	19.7	17.7	68.0	63.7	63.7	89.2	81.9	81.9
Actuated g/C Ratio	0.25	0.17	0.16	0.20	0.15	0.13	0.51	0.48	0.48	0.67	0.62	0.62
Clearance Time (s)	4.5	5.2	5.2	4.0	5.2	5.2	4.0	7.8	7.8	4.0	7.8	7.8
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	356	609	236	257	525	197	125	2126	767	359	2733	915
v/s Ratio Prot	c0.03	0.06		c0.07	0.01		0.02	0.36		c0.15	c0.55	
v/s Ratio Perm	0.05		0.09	c0.17		0.01	0.26		0.09	0.43		0.09
v/c Ratio	0.33	0.36	0.55	1.23	0.08	0.04	0.54	0.74	0.19	0.87	0.89	0.14
Uniform Delay, d1	39.7	48.7	51.8	51.9	48.8	50.2	24.7	27.9	19.8	41.1	21.7	10.7
Progression 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
Incremental Delay, d2	0.5	0.8	4.7	134.1	0.1	0.2	4.8	2.4	0.5	20.0	5.0	0.3
Delay (s)	40.2	49.5	56.6	185.9	48.9	50.4	29.5	30.3	20.3	61.1	26.8	11.0
Level of Service	D	D	E	F	D	D	C	C	C	E	C	B
Approach Delay (s)		50.5			151.3			29.1			29.6	
Approach LOS		D			F			C			C	

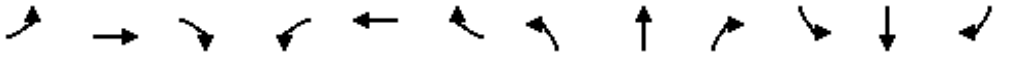
Intersection Summary			
HCM 2000 Control Delay	40.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	132.8	Sum of lost time (s)	15.0
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	257	1079	237	592	1279	283	209	1366	540	253	840	289
v/c Ratio	0.75	0.83	0.40	0.96	0.78	0.41	0.67	0.91	0.74	0.90	0.58	0.43
Control Delay	73.3	51.4	11.9	82.0	42.0	13.0	71.0	53.0	25.3	93.5	39.7	10.7
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	73.3	51.4	11.9	82.0	42.0	13.0	71.0	53.0	25.3	93.5	39.7	10.7
Queue Length 50th (m)	35.1	112.2	10.4	81.5	124.3	18.6	28.1	144.9	63.0	35.0	77.7	12.0
Queue Length 95th (m)	#54.3	132.5	32.4	#117.0	145.0	41.8	41.4	#170.7	108.3	#59.2	93.8	35.5
Internal Link Dist (m)		239.5			177.4			308.0			325.9	
Turn Bay Length (m)	142.0		89.0	147.0		118.0	120.0		132.0	120.0		115.0
Base Capacity (vph)	342	1307	594	618	1669	704	318	1500	725	282	1451	675
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	0.75	0.83	0.40	0.96	0.77	0.40	0.66	0.91	0.74	0.90	0.58	0.43

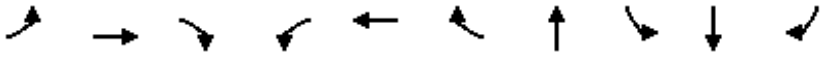
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	257	1079	237	592	1279	283	209	1366	540	253	840	289
Future Volume (vph)	257	1079	237	592	1279	283	209	1366	540	253	840	289
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3340	4520	1601	3471	4520	1601	3471	4476	1601	3471	4433	1601
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3340	4520	1601	3471	4520	1601	3471	4476	1601	3471	4433	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	257	1079	237	592	1279	283	209	1366	540	253	840	289
RTOR Reduction (vph)	0	0	131	0	0	114	0	0	189	0	0	151
Lane Group Flow (vph)	257	1079	106	592	1279	169	209	1366	351	253	840	138
Heavy Vehicles (%)	6%	2%	2%	2%	2%	2%	2%	3%	2%	2%	4%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	12.8	36.8	36.8	23.0	47.0	47.0	11.1	43.2	43.2	10.0	42.1	42.1
Effective Green, g (s)	13.8	38.8	38.8	24.0	49.0	49.0	12.1	45.2	45.2	11.0	44.1	44.1
Actuated g/C Ratio	0.10	0.29	0.29	0.18	0.36	0.36	0.09	0.34	0.34	0.08	0.33	0.33
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	3.2	3.2	3.0	3.2	3.2
Lane Grp Cap (vph)	341	1301	460	617	1643	581	311	1500	536	283	1450	523
v/s Ratio Prot	0.08	c0.24		c0.17	0.28		0.06	c0.31		c0.07	0.19	
v/s Ratio Perm			0.07			0.11			0.22			0.09
v/c Ratio	0.75	0.83	0.23	0.96	0.78	0.29	0.67	0.91	0.66	0.89	0.58	0.26
Uniform Delay, d1	58.8	44.9	36.6	54.9	38.1	30.5	59.4	42.9	38.2	61.3	37.6	33.4
Progression 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
Incremental Delay, d2	9.1	4.7	0.4	26.1	2.5	0.4	5.6	8.7	2.9	27.9	0.6	0.3
Delay (s)	68.0	49.6	37.0	81.0	40.6	30.9	65.0	51.6	41.1	89.2	38.2	33.7
Level of Service	E	D	D	F	D	C	E	D	D	F	D	C
Approach Delay (s)		50.7			50.5			50.2			46.6	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	49.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	134.8	Sum of lost time (s)	15.8
Intersection Capacity Utilization	86.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	243	1520	122	8	2018	128	343	197	84	79
v/c Ratio	0.87	0.53	0.11	0.04	0.88	0.15	0.89	0.65	0.16	0.16
Control Delay	69.3	15.3	2.3	9.8	37.4	7.4	72.9	56.0	38.6	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.3	15.3	2.3	9.8	37.4	7.4	72.9	56.0	38.6	5.3
Queue Length 50th (m)	52.9	92.8	0.0	0.7	217.5	5.6	91.5	49.1	17.8	0.0
Queue Length 95th (m)	#98.2	127.8	8.6	2.6	243.9	16.8	#144.4	77.2	31.3	8.9
Internal Link Dist (m)		1174.8			389.4		298.2		317.5	
Turn Bay Length (m)	130.0		85.0	85.0		85.0		85.0		85.0
Base Capacity (vph)	294	2870	1070	194	2290	855	417	329	579	536
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.53	0.11	0.04	0.88	0.15	0.82	0.60	0.15	0.15

Intersection Summary

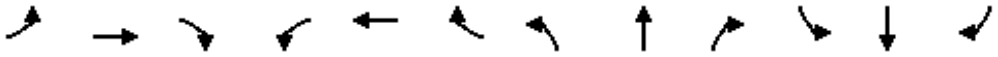
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	243	1520	122	8	2018	128	207	85	51	197	84	79
Future Volume (vph)	243	1520	122	8	2018	128	207	85	51	197	84	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.6	5.6	3.0	5.6	5.6		3.0		4.0	3.0	5.0
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97		0.95	1.00	1.00
Satd. Flow (prot)	1789	4476	1601	1789	4520	1601		1792		1789	1883	1601
Flt Permitted	0.05	1.00	1.00	0.11	1.00	1.00		0.73		0.58	1.00	1.00
Satd. Flow (perm)	98	4476	1601	214	4520	1601		1341		1098	1883	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	243	1520	122	8	2018	128	207	85	51	197	84	79
RTOR Reduction (vph)	0	0	45	0	0	43	0	4	0	0	0	58
Lane Group Flow (vph)	243	1520	77	8	2018	85	0	339	0	197	84	21
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	93.5	88.4	88.4	73.8	72.7	72.7		38.0		38.0	38.0	38.0
Effective Green, g (s)	94.5	90.4	90.4	75.8	74.7	74.7		40.0		39.0	40.0	38.0
Actuated g/C Ratio	0.66	0.63	0.63	0.53	0.52	0.52		0.28		0.27	0.28	0.26
Clearance Time (s)	4.0	7.6	7.6	4.0	7.6	7.6		5.0		5.0	5.0	5.0
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0		5.0		5.0	5.0	5.0
Lane Grp Cap (vph)	273	2807	1004	135	2343	829		372		297	522	422
v/s Ratio Prot	c0.11	0.34		0.00	0.45						0.04	
v/s Ratio Perm	c0.47		0.05	0.03		0.05		c0.25		0.18		0.01
v/c Ratio	0.89	0.54	0.08	0.06	0.86	0.10		0.91		0.66	0.16	0.05
Uniform Delay, d1	47.6	15.2	10.5	16.5	30.2	17.6		50.3		46.7	39.4	39.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	28.1	0.8	0.1	0.2	4.5	0.2		26.9		7.2	0.3	0.1
Delay (s)	75.7	15.9	10.7	16.7	34.6	17.9		77.2		53.9	39.7	39.7
Level of Service	E	B	B	B	C	B		E		D	D	D
Approach Delay (s)		23.3			33.6			77.2			47.5	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	33.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	144.1	Sum of lost time (s)	11.6
Intersection Capacity Utilization	89.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	1516	216	34	1781	172	374	27	97	1
v/c Ratio	0.66	0.23	0.17	0.69	0.17	0.81	0.05	0.22	0.00
Control Delay	20.1	3.2	11.5	16.5	2.4	43.1	8.1	23.4	19.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.1	3.2	11.5	16.5	2.4	43.1	8.1	23.4	19.0
Queue Length 50th (m)	87.1	0.0	2.3	87.3	0.1	62.2	0.1	12.8	0.1
Queue Length 95th (m)	129.4	12.9	7.5	135.2	9.6	95.6	5.3	24.2	1.2
Internal Link Dist (m)	389.4			948.2			362.8		565.8
Turn Bay Length (m)		85.0	85.0		85.0	85.0		85.0	
Base Capacity (vph)	2310	930	203	2591	990	663	781	648	897
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.23	0.17	0.69	0.17	0.56	0.03	0.15	0.00

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1516	216	34	1781	172	374	1	26	97	1	0
Future Volume (vph)	0	1516	216	34	1781	172	374	1	26	97	1	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.6	5.6	3.5	5.6	5.6	3.6	2.6		3.6	2.6	
Lane Util. Factor		*0.80	1.00	1.00	*0.80	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.86		1.00	1.00	
Flt Protected		1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		4476	1601	1789	4520	1601	1789	1611		1789	1883	
Flt Permitted		1.00	1.00	0.08	1.00	1.00	0.76	1.00		0.74	1.00	
Satd. Flow (perm)		4476	1601	154	4520	1601	1426	1611		1393	1883	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1516	216	34	1781	172	374	1	26	97	1	0
RTOR Reduction (vph)	0	0	107	0	0	71	0	18	0	0	0	0
Lane Group Flow (vph)	0	1516	109	34	1781	101	374	9	0	97	1	0
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		44.3	44.3	51.5	51.5	51.5	27.9	27.9		27.9	27.9	
Effective Green, g (s)		46.3	46.3	52.5	53.5	53.5	28.9	29.9		28.9	29.9	
Actuated g/C Ratio		0.51	0.51	0.57	0.58	0.58	0.32	0.33		0.32	0.33	
Clearance Time (s)		7.6	7.6	4.5	7.6	7.6	4.6	4.6		4.6	4.6	
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		2262	809	154	2639	935	449	525		439	614	
v/s Ratio Prot		0.34		0.01	c0.39			0.01			0.00	
v/s Ratio Perm			0.07	0.12		0.06	c0.26			0.07		
v/c Ratio		0.67	0.13	0.22	0.67	0.11	0.83	0.02		0.22	0.00	
Uniform Delay, d1		16.9	12.0	11.6	13.1	8.5	29.1	20.9		23.1	20.8	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.6	0.3	0.7	1.4	0.2	12.5	0.0		0.3	0.0	
Delay (s)		18.5	12.4	12.3	14.5	8.7	41.6	20.9		23.3	20.8	
Level of Service		B	B	B	B	A	D	C		C	C	
Approach Delay (s)		17.8			13.9			40.2			23.3	
Approach LOS		B			B			D			C	

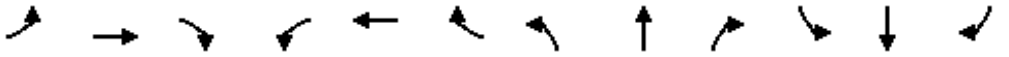
Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	91.6	Sum of lost time (s)	11.7
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	310	1174	174	26	1731	185	142	84	95	586	114
v/c Ratio	1.03	0.53	0.20	0.11	0.97	0.26	0.94	0.11	0.14	1.01	0.19
Control Delay	98.1	25.8	3.5	28.3	56.8	9.7	91.9	27.9	0.4	86.4	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	98.1	25.8	3.5	28.3	56.8	9.7	91.9	27.9	0.4	86.4	2.1
Queue Length 50th (m)	~77.0	97.2	0.0	4.3	194.2	8.9	26.2	14.8	0.0	~163.8	0.0
Queue Length 95th (m)	#135.9	113.6	12.6	10.3	#233.9	24.9	#65.9	26.2	0.0	#239.6	4.4
Internal Link Dist (m)		948.2			653.2			218.8		343.3	
Turn Bay Length (m)	85.0		85.0	85.0		85.0	85.0		85.0		85.0
Base Capacity (vph)	302	2209	885	247	1785	712	151	733	701	583	586
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.03	0.53	0.20	0.11	0.97	0.26	0.94	0.11	0.14	1.01	0.19

Intersection Summary

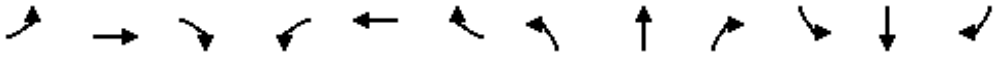
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	310	1174	174	26	1731	185	142	84	95	0	586	114
Future Volume (vph)	310	1174	174	26	1731	185	142	84	95	0	586	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.6	5.6	3.0	5.6	5.6	3.5	2.6	4.6		2.6	4.6
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00		1.00	1.00
Satd. Flow (prot)	1789	4433	1601	1789	4520	1601	1789	1883	1601		1883	1601
Flt Permitted	0.08	1.00	1.00	0.19	1.00	1.00	0.09	1.00	1.00		1.00	1.00
Satd. Flow (perm)	156	4433	1601	364	4520	1601	164	1883	1601		1883	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	310	1174	174	26	1731	185	142	84	95	0	586	114
RTOR Reduction (vph)	0	0	89	0	0	80	0	0	59	0	0	80
Lane Group Flow (vph)	310	1174	85	26	1731	105	142	84	36	0	586	34
Heavy Vehicles (%)	2%	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8		8	4		4
Actuated Green, G (s)	66.2	66.2	66.2	56.9	53.3	53.3	52.5	52.5	52.5		41.4	41.4
Effective Green, g (s)	67.2	68.2	68.2	57.9	55.3	55.3	53.5	54.5	52.5		43.4	41.4
Actuated g/C Ratio	0.48	0.49	0.49	0.41	0.39	0.39	0.38	0.39	0.38		0.31	0.30
Clearance Time (s)	4.0	7.6	7.6	4.0	7.6	7.6	4.5	4.6	4.6		4.6	4.6
Vehicle Extension (s)	3.0	5.0	5.0	2.5	5.0	5.0	3.0	5.0	5.0		5.0	5.0
Lane Grp Cap (vph)	296	2159	779	212	1785	632	150	733	600		583	473
v/s Ratio Prot	c0.14	0.26		0.01	c0.38		c0.05	0.04			c0.31	
v/s Ratio Perm	c0.36		0.05	0.05		0.07	0.31		0.02			0.02
v/c Ratio	1.05	0.54	0.11	0.12	0.97	0.17	0.95	0.11	0.06		1.01	0.07
Uniform Delay, d1	45.2	25.0	19.4	25.9	41.5	27.4	35.8	27.3	28.0		48.3	35.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	65.2	1.0	0.3	0.2	15.2	0.6	57.0	0.1	0.1		38.5	0.1
Delay (s)	110.4	26.0	19.7	26.1	56.8	28.0	92.8	27.5	28.1		86.8	35.6
Level of Service	F	C	B	C	E	C	F	C	C		F	D
Approach Delay (s)		41.1			53.6			56.6			78.5	
Approach LOS		D			D			E			E	

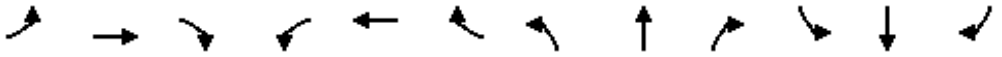
Intersection Summary			
HCM 2000 Control Delay	53.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.7
Intersection Capacity Utilization	104.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	188	971	111	364	1543	118	240	1829	268	80	1748	467
v/c Ratio	0.90	0.75	0.19	0.78	0.94	0.18	0.91	0.95	0.34	0.53	0.98	0.64
Control Delay	108.8	52.5	0.7	74.9	57.8	3.6	104.8	53.0	10.6	83.5	62.1	28.3
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	108.8	52.5	0.7	74.9	57.8	3.6	104.8	53.0	10.6	83.5	62.1	28.3
Queue Length 50th (m)	29.1	108.5	0.0	55.2	184.2	0.0	37.2	216.3	15.9	12.2	212.8	75.4
Queue Length 95th (m)	#51.7	127.6	0.0	#77.5	#218.7	9.4	#62.6	#255.0	36.6	21.3	#253.5	114.3
Internal Link Dist (m)		653.2			318.6			323.5			163.2	
Turn Bay Length (m)	130.0		85.0	85.0		95.0	85.0		85.0	230.0		85.0
Base Capacity (vph)	210	1327	606	469	1645	669	263	1928	785	150	1780	726
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	0.90	0.73	0.18	0.78	0.94	0.18	0.91	0.95	0.34	0.53	0.98	0.64

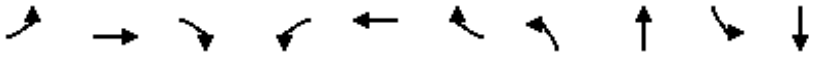
Intersection Summary

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



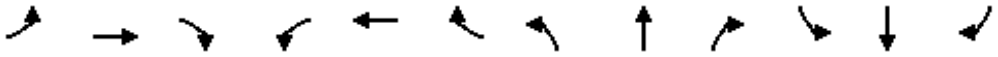
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	188	971	111	364	1543	118	240	1829	268	80	1748	467
Future Volume (vph)	188	971	111	364	1543	118	240	1829	268	80	1748	467
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3471	4476	1601	3471	4520	1601	3471	4520	1601	3471	4520	1601
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3471	4476	1601	3471	4520	1601	3471	4520	1601	3471	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	188	971	111	364	1543	118	240	1829	268	80	1748	467
RTOR Reduction (vph)	0	0	79	0	0	75	0	0	103	0	0	96
Lane Group Flow (vph)	188	971	32	364	1543	43	240	1829	165	80	1748	371
Heavy Vehicles (%)	2%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	8.1	41.4	41.4	19.3	52.6	52.6	10.4	62.0	62.0	5.5	57.1	57.1
Effective Green, g (s)	9.1	43.4	43.4	20.3	54.6	54.6	11.4	64.0	64.0	6.5	59.1	59.1
Actuated g/C Ratio	0.06	0.29	0.29	0.14	0.36	0.36	0.08	0.43	0.43	0.04	0.39	0.39
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	3.0	3.0	3.0	5.0	5.0
Lane Grp Cap (vph)	210	1295	463	469	1645	582	263	1928	683	150	1780	630
v/s Ratio Prot	0.05	0.22		c0.10	c0.34		0.07	c0.40		0.02	c0.39	
v/s Ratio Perm			0.02			0.03			0.10			0.23
v/c Ratio	0.90	0.75	0.07	0.78	0.94	0.07	0.91	0.95	0.24	0.53	0.98	0.59
Uniform Delay, d1	70.0	48.4	38.7	62.7	46.1	31.2	68.8	41.4	27.5	70.3	44.9	35.9
Progression 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
Incremental Delay, d2	34.7	4.0	0.3	7.9	11.7	0.2	33.2	10.7	0.2	3.6	17.3	2.2
Delay (s)	104.7	52.4	38.9	70.5	57.7	31.4	102.0	52.1	27.7	73.9	62.2	38.1
Level of Service	F	D	D	E	E	C	F	D	C	E	E	D
Approach Delay (s)		59.0			58.5			54.4			57.7	
Approach LOS		E			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	57.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	15.8
Intersection Capacity Utilization	90.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	207	1137	24	135	1960	25	19	33	117	34
v/c Ratio	0.77	0.36	0.02	0.37	0.66	0.02	0.11	0.13	0.65	0.13
Control Delay	54.3	8.5	0.6	7.1	17.3	0.0	52.1	19.5	73.8	27.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.3	8.5	0.6	7.1	17.3	0.0	52.1	19.5	73.8	27.4
Queue Length 50th (m)	38.1	45.0	0.0	5.9	125.9	0.0	4.7	1.0	31.3	3.2
Queue Length 95th (m)	63.6	67.7	1.0	13.2	193.6	0.0	11.9	10.3	49.3	12.7
Internal Link Dist (m)		318.6			344.0			313.0		312.0
Turn Bay Length (m)	85.0		85.0	85.0		85.0	85.0		85.0	
Base Capacity (vph)	311	3149	1161	387	2989	1087	375	476	376	490
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.36	0.02	0.35	0.66	0.02	0.05	0.07	0.31	0.07

Intersection Summary



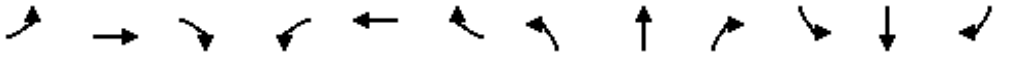
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	207	1137	24	135	1960	25	19	4	29	117	13	21
Future Volume (vph)	207	1137	24	135	1960	25	19	4	29	117	13	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.6	5.6	3.5	5.6	5.6	3.6	2.6		3.6	2.6	
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.87		1.00	0.91	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1789	4391	1601	1789	4520	1601	1789	1635		1789	1709	
Flt Permitted	0.04	1.00	1.00	0.20	1.00	1.00	0.73	1.00		0.74	1.00	
Satd. Flow (perm)	84	4391	1601	377	4520	1601	1384	1635		1386	1709	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	207	1137	24	135	1960	25	19	4	29	117	13	21
RTOR Reduction (vph)	0	0	7	0	0	8	0	25	0	0	18	0
Lane Group Flow (vph)	207	1137	17	135	1960	17	19	8	0	117	16	0
Heavy Vehicles (%)	2%	5%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	110.6	98.4	98.4	98.3	90.6	90.6	17.2	17.2		17.2	17.2	
Effective Green, g (s)	111.6	100.4	100.4	100.3	92.6	92.6	18.2	19.2		18.2	19.2	
Actuated g/C Ratio	0.80	0.72	0.72	0.72	0.66	0.66	0.13	0.14		0.13	0.14	
Clearance Time (s)	4.5	7.6	7.6	4.5	7.6	7.6	4.6	4.6		4.6	4.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	267	3148	1148	357	2989	1058	179	224		180	234	
v/s Ratio Prot	c0.09	0.26		0.02	0.43			0.00			0.01	
v/s Ratio Perm	c0.52		0.01	0.25		0.01	0.01			c0.08		
v/c Ratio	0.78	0.36	0.01	0.38	0.66	0.02	0.11	0.04		0.65	0.07	
Uniform Delay, d1	41.9	7.6	5.7	6.1	14.2	8.1	53.7	52.4		57.9	52.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	13.1	0.3	0.0	0.7	1.1	0.0	0.3	0.1		8.1	0.1	
Delay (s)	55.1	7.9	5.7	6.8	15.3	8.1	54.0	52.4		66.0	52.7	
Level of Service	E	A	A	A	B	A	D	D		E	D	
Approach Delay (s)		15.0			14.7			53.0			63.0	
Approach LOS		B			B			D			E	

Intersection Summary			
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	11.7
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	123	1164	8	127	1498	181	21	433	258	336	603
v/c Ratio	0.60	0.62	0.01	0.59	0.80	0.24	0.06	0.76	1.01	0.52	0.84
Control Delay	34.9	26.9	0.0	45.9	33.4	4.1	17.7	42.4	85.8	30.2	29.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.9	26.9	0.0	45.9	33.4	4.1	17.7	42.4	85.8	30.2	29.9
Queue Length 50th (m)	15.3	79.0	0.0	17.3	121.5	0.0	2.6	82.0	37.5	52.0	67.0
Queue Length 95th (m)	#38.9	104.8	0.0	#30.6	144.5	13.3	6.8	110.3	#78.0	83.3	#139.7
Internal Link Dist (m)		344.0			620.6			300.4		386.3	
Turn Bay Length (m)	125.0		85.0	135.0		85.0	122.0				85.0
Base Capacity (vph)	204	1879	715	215	1862	766	360	658	256	662	724
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.62	0.01	0.59	0.80	0.24	0.06	0.66	1.01	0.51	0.83

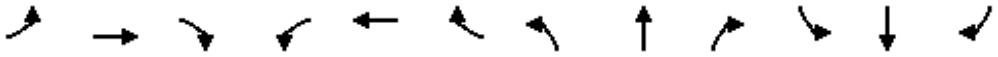
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	123	1164	8	127	1498	181	21	366	67	258	336	603
Future Volume (vph)	123	1164	8	127	1498	181	21	366	67	258	336	603
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	3.3		3.0	3.3	3.3
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1659	4350	1484	1789	4520	1601	1789	1840		1789	1746	1484
Flt Permitted	0.11	1.00	1.00	0.16	1.00	1.00	0.44	1.00		0.20	1.00	1.00
Satd. Flow (perm)	197	4350	1484	297	4520	1601	820	1840		381	1746	1484
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	123	1164	8	127	1498	181	21	366	67	258	336	603
RTOR Reduction (vph)	0	0	5	0	0	110	0	6	0	0	0	162
Lane Group Flow (vph)	123	1164	3	127	1498	71	21	427	0	258	336	441
Heavy Vehicles (%)	10%	6%	10%	2%	2%	2%	2%	2%	2%	2%	10%	10%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	43.1	43.1	43.1	43.8	40.9	40.9	36.4	34.2		45.2	39.0	39.0
Effective Green, g (s)	44.1	45.1	45.1	44.8	42.9	42.9	38.4	36.2		46.2	41.0	41.0
Actuated g/C Ratio	0.40	0.41	0.41	0.41	0.39	0.39	0.35	0.33		0.42	0.37	0.37
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	6.9	4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0		3.0	5.0	5.0
Lane Grp Cap (vph)	194	1783	608	209	1762	624	314	605		262	650	553
v/s Ratio Prot	0.05	c0.27		0.04	c0.33		0.00	0.23		c0.07	0.19	
v/s Ratio Perm	0.20		0.00	0.21		0.04	0.02			c0.34		0.30
v/c Ratio	0.63	0.65	0.01	0.61	0.85	0.11	0.07	0.71		0.98	0.52	0.80
Uniform Delay, d1	26.1	26.1	19.2	34.3	30.6	21.4	23.9	32.2		29.8	26.8	30.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.6	1.9	0.0	4.9	5.4	0.4	0.1	4.7		51.0	1.4	8.9
Delay (s)	32.8	28.0	19.2	39.3	36.0	21.8	23.9	36.9		80.8	28.2	39.7
Level of Service	C	C	B	D	D	C	C	D		F	C	D
Approach Delay (s)		28.4			34.8			36.3			45.3	
Approach LOS		C			C			D			D	

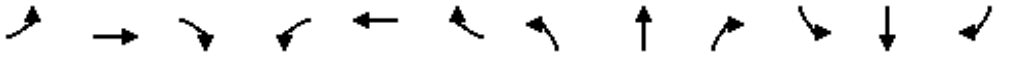
Intersection Summary			
HCM 2000 Control Delay	35.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	14.2
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	143	1359	10	104	1496	404	21	136	203	302	156	274
v/c Ratio	0.67	0.59	0.01	0.46	0.59	0.38	0.25	0.55	0.53	0.73	0.36	0.53
Control Delay	51.9	21.4	0.0	20.1	19.7	3.4	64.7	58.7	9.7	64.0	42.7	17.9
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	51.9	21.4	0.0	20.1	19.7	3.4	64.7	58.7	9.7	64.0	42.7	17.9
Queue Length 50th (m)	16.2	90.3	0.0	11.0	96.9	4.1	5.1	31.8	0.0	37.2	33.5	18.6
Queue Length 95th (m)	#41.0	123.6	0.0	22.8	124.9	20.1	13.5	49.9	15.8	52.3	50.7	43.9
Internal Link Dist (m)		620.6			722.4			257.9			305.8	
Turn Bay Length (m)	85.0		85.0	85.0		85.0	120.0		85.0			85.0
Base Capacity (vph)	212	2319	931	228	2544	1061	85	587	631	430	730	734
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	0.67	0.59	0.01	0.46	0.59	0.38	0.25	0.23	0.32	0.70	0.21	0.37

Intersection Summary

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



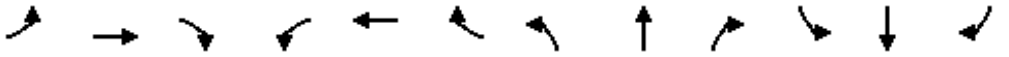
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	143	1359	10	104	1496	404	21	136	203	302	156	274
Future Volume (vph)	143	1359	10	104	1496	404	21	136	203	302	156	274
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.6	5.6	3.5	5.6	5.6	3.5	2.9	4.9	3.5	2.9	2.9
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	1.00	1.00	0.97	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	4269	1601	1789	4520	1601	1789	1883	1601	3471	1883	1601
Flt Permitted	0.11	1.00	1.00	0.09	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	203	4269	1601	164	4520	1601	1789	1883	1601	3471	1883	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	143	1359	10	104	1496	404	21	136	203	302	156	274
RTOR Reduction (vph)	0	0	5	0	0	165	0	0	177	0	0	142
Lane Group Flow (vph)	143	1359	5	104	1496	239	21	136	26	302	156	132
Heavy Vehicles (%)	2%	8%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8			2			6
Actuated Green, G (s)	67.2	64.1	64.1	66.6	66.6	66.6	3.0	16.2	16.2	13.9	27.1	27.1
Effective Green, g (s)	68.2	66.1	66.1	67.6	68.6	68.6	4.0	18.2	16.2	14.9	29.1	29.1
Actuated g/C Ratio	0.55	0.53	0.53	0.54	0.55	0.55	0.03	0.15	0.13	0.12	0.23	0.23
Clearance Time (s)	4.5	7.6	7.6	4.5	7.6	7.6	4.5	4.9	4.9	4.5	4.9	4.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	209	2257	846	222	2480	878	57	274	207	413	438	372
v/s Ratio Prot	c0.04	0.32		0.04	c0.33		0.01	c0.07		c0.09	0.08	
v/s Ratio Perm	c0.33		0.00	0.21		0.15			0.02			0.08
v/c Ratio	0.68	0.60	0.01	0.47	0.60	0.27	0.37	0.50	0.13	0.73	0.36	0.36
Uniform Delay, d1	32.1	20.4	13.9	17.9	19.0	15.0	59.3	49.2	48.1	53.1	40.1	40.1
Progression 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
Incremental Delay, d2	8.9	1.2	0.0	1.6	1.1	0.8	4.0	1.4	0.3	6.5	0.5	0.6
Delay (s)	41.0	21.6	13.9	19.4	20.1	15.7	63.3	50.6	48.4	59.7	40.6	40.7
Level of Service	D	C	B	B	C	B	E	D	D	E	D	D
Approach Delay (s)		23.3			19.2			50.1			48.5	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	27.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	75	1818	8	104	1919	455	66	270	335	426	31
v/c Ratio	0.44	0.81	0.01	0.60	0.77	0.44	0.55	0.48	0.80	0.53	0.07
Control Delay	22.4	27.1	0.0	53.1	24.5	6.2	72.4	42.4	66.2	43.8	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.4	27.1	0.0	53.1	24.5	6.2	72.4	42.4	66.2	43.8	0.3
Queue Length 50th (m)	7.7	138.2	0.0	10.8	143.5	14.4	15.1	26.4	39.6	47.7	0.0
Queue Length 95th (m)	18.3	183.4	0.0	#33.5	188.8	40.1	#33.7	39.6	#65.1	63.7	0.0
Internal Link Dist (m)		722.4			1030.1			436.1		413.0	
Turn Bay Length (m)	85.0		85.0	85.0		85.0	85.0		85.0		85.0
Base Capacity (vph)	171	2241	881	173	2503	1032	123	1147	421	1355	682
Starvation Cap Reductn	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
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.81	0.01	0.60	0.77	0.44	0.54	0.24	0.80	0.31	0.05

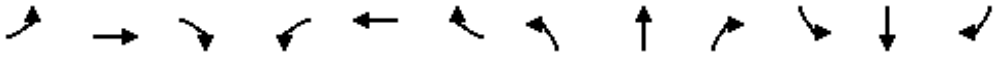
Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	1818	8	104	1919	455	66	198	72	335	426	31
Future Volume (vph)	75	1818	8	104	1919	455	66	198	72	335	426	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.6	5.6	3.0	5.6	5.6	3.5	2.6		3.5	2.6	4.6
Lane Util. Factor	1.00	*0.80	1.00	1.00	*0.80	1.00	1.00	0.95		0.97	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1659	4192	1526	1690	4520	1601	1772	3435		3471	3579	1601
Flt Permitted	0.07	1.00	1.00	0.07	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	124	4192	1526	119	4520	1601	1772	3435		3471	3579	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	75	1818	8	104	1919	455	66	198	72	335	426	31
RTOR Reduction (vph)	0	0	4	0	0	148	0	31	0	0	0	25
Lane Group Flow (vph)	75	1818	4	104	1919	307	66	239	0	335	426	6
Heavy Vehicles (%)	10%	10%	7%	8%	2%	2%	3%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6						4
Actuated Green, G (s)	61.9	61.9	61.9	67.8	64.2	64.2	5.8	17.3		13.5	25.0	25.0
Effective Green, g (s)	62.9	63.9	63.9	68.8	66.2	66.2	6.8	19.3		14.5	27.0	25.0
Actuated g/C Ratio	0.52	0.53	0.53	0.57	0.55	0.55	0.06	0.16		0.12	0.22	0.21
Clearance Time (s)	4.0	7.6	7.6	4.0	7.6	7.6	4.5	4.6		4.5	4.6	4.6
Vehicle Extension (s)	2.5	5.0	5.0	2.5	5.0	5.0	3.0	5.0		3.0	5.0	5.0
Lane Grp Cap (vph)	146	2210	804	181	2468	874	99	546		415	797	330
v/s Ratio Prot	0.03	c0.43		0.04	c0.42		0.04	0.07		c0.10	c0.12	
v/s Ratio Perm	0.24		0.00	0.28		0.19						0.00
v/c Ratio	0.51	0.82	0.01	0.57	0.78	0.35	0.67	0.44		0.81	0.53	0.02
Uniform Delay, d1	23.1	23.9	13.6	37.3	21.7	15.4	56.1	46.0		52.0	41.6	38.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.3	2.9	0.0	3.6	1.9	0.5	15.7	1.2		11.0	1.3	0.0
Delay (s)	25.4	26.8	13.6	40.8	23.6	15.9	71.8	47.2		63.0	42.8	38.4
Level of Service	C	C	B	D	C	B	E	D		E	D	D
Approach Delay (s)		26.7			22.9			52.0			51.2	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	30.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	121.2	Sum of lost time (s)	14.7
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

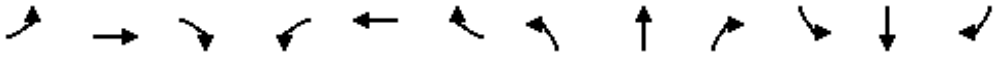


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	267	1704	451	350	1872	688	482	1423	239	284	1399	187
v/c Ratio	1.02	1.06	0.62	1.04	1.09	0.95	1.06	0.90	0.36	0.99	1.03	0.34
Control Delay	124.2	83.8	21.8	123.0	93.0	55.4	118.1	53.8	13.5	115.9	81.4	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	124.2	83.8	21.8	123.0	93.0	55.4	118.1	53.8	13.5	115.9	81.4	16.2
Queue Length 50th (m)	~40.9	~222.9	51.5	~56.0	~251.4	151.9	~78.1	161.5	16.1	42.7	~178.6	14.0
Queue Length 95th (m)	#70.4	#256.1	88.8	#87.6	#284.1	#234.1	#113.1	185.2	37.8	#72.5	#212.3	34.4
Internal Link Dist (m)		309.3			173.0			421.7			476.7	
Turn Bay Length (m)	50.0		70.0	90.0		70.0	165.0		70.0	140.0		70.0
Base Capacity (vph)	263	1611	725	335	1717	723	454	1574	664	287	1358	551
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	1.02	1.06	0.62	1.04	1.09	0.95	1.06	0.90	0.36	0.99	1.03	0.34

Intersection Summary

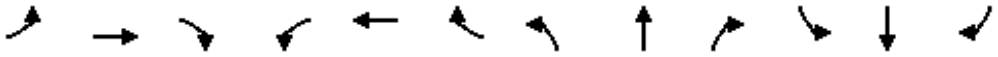
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	267	1704	451	350	1872	688	482	1423	239	284	1399	187
Future Volume (vph)	267	1704	451	350	1872	688	482	1423	239	284	1399	187
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9	3.0	4.9	4.9
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3437	4476	1601	3471	4520	1601	3471	4476	1601	3471	4476	1541
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3437	4476	1601	3471	4520	1601	3471	4476	1601	3471	4476	1541
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	267	1704	451	350	1872	688	482	1423	239	284	1399	187
RTOR Reduction (vph)	0	0	149	0	0	115	0	0	102	0	0	84
Lane Group Flow (vph)	267	1704	302	350	1872	573	482	1423	137	284	1399	103
Heavy Vehicles (%)	3%	3%	2%	2%	2%	2%	2%	3%	2%	2%	3%	6%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	10.1	50.2	50.2	13.0	53.1	53.1	18.0	49.0	49.0	11.0	42.0	42.0
Effective Green, g (s)	11.1	52.2	52.2	14.0	55.1	55.1	19.0	51.0	51.0	12.0	44.0	44.0
Actuated g/C Ratio	0.08	0.36	0.36	0.10	0.38	0.38	0.13	0.35	0.35	0.08	0.30	0.30
Clearance Time (s)	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9	4.0	6.9	6.9
Vehicle Extension (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	263	1611	576	335	1717	608	454	1574	563	287	1358	467
v/s Ratio Prot	0.08	0.38		c0.10	c0.41		c0.14	0.32		0.08	c0.31	
v/s Ratio Perm			0.19			0.36			0.09			0.07
v/c Ratio	1.02	1.06	0.52	1.04	1.09	0.94	1.06	0.90	0.24	0.99	1.03	0.22
Uniform Delay, d1	67.0	46.4	36.6	65.5	45.0	43.4	63.0	44.7	33.3	66.4	50.5	37.7
Progression 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
Incremental Delay, d2	59.4	39.5	1.1	61.3	50.8	23.3	59.6	8.9	1.0	49.7	32.5	1.1
Delay (s)	126.4	85.9	37.7	126.8	95.7	66.7	122.6	53.6	34.4	116.1	83.0	38.8
Level of Service	F	F	D	F	F	E	F	D	C	F	F	D
Approach Delay (s)		81.4			92.6			67.0			83.6	
Approach LOS		F			F			E			F	

Intersection Summary			
HCM 2000 Control Delay	82.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	15.8
Intersection Capacity Utilization	99.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

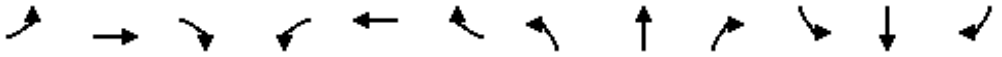


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	182	785	311	107	1260	66	299	1842	148	101	1928	195
v/c Ratio	0.48	0.50	0.40	0.52	0.90	0.09	1.39	1.17	0.23	0.65	1.29	0.31
Control Delay	64.7	30.3	15.9	75.4	51.9	0.2	248.9	124.8	10.3	87.6	173.6	13.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.7	30.3	15.9	75.4	51.9	0.2	248.9	124.8	10.3	87.6	173.6	13.0
Queue Length 50th (m)	25.7	83.7	31.2	15.6	177.7	0.0	~58.7	~261.3	6.5	15.0	~292.3	11.8
Queue Length 95th (m)	37.7	102.3	54.8	25.8	#224.4	0.0	#88.8	#294.3	22.0	#26.8	#324.9	30.9
Internal Link Dist (m)		214.6			322.8			284.8			465.5	
Turn Bay Length (m)	85.0		140.0	85.0		85.0	85.0		85.0	85.0		85.0
Base Capacity (vph)	704	1582	786	210	1393	728	215	1577	632	155	1499	621
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	0.26	0.50	0.40	0.51	0.90	0.09	1.39	1.17	0.23	0.65	1.29	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.

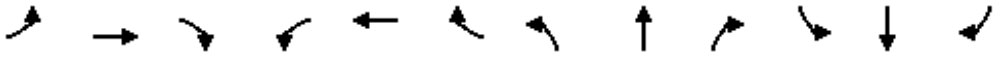


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	182	785	311	107	1260	66	299	1842	148	101	1928	195
Future Volume (vph)	182	785	311	107	1260	66	299	1842	148	101	1928	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.2	4.2	3.0	4.2	4.2	3.0	4.9	4.9	3.0	4.9	4.9
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3404	3579	1601	3471	3579	1601	3471	4520	1601	3471	4520	1601
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3404	3579	1601	3471	3579	1601	3471	4520	1601	3471	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	182	785	311	107	1260	66	299	1842	148	101	1928	195
RTOR Reduction (vph)	0	0	79	0	0	40	0	0	74	0	0	91
Lane Group Flow (vph)	182	785	232	107	1260	26	299	1842	74	101	1928	104
Heavy Vehicles (%)	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	15.3	62.1	62.1	7.7	54.5	54.5	8.0	48.6	48.6	5.5	46.1	46.1
Effective Green, g (s)	16.3	64.1	64.1	8.7	56.5	56.5	9.0	50.6	50.6	6.5	48.1	48.1
Actuated g/C Ratio	0.11	0.44	0.44	0.06	0.39	0.39	0.06	0.35	0.35	0.04	0.33	0.33
Clearance Time (s)	4.0	6.2	6.2	4.0	6.2	6.2	4.0	6.9	6.9	4.0	6.9	6.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	382	1582	707	208	1394	623	215	1577	558	155	1499	531
v/s Ratio Prot	c0.05	0.22		c0.03	c0.35		c0.09	0.41		0.03	c0.43	
v/s Ratio Perm			0.15			0.02			0.05			0.07
v/c Ratio	0.48	0.50	0.33	0.51	0.90	0.04	1.39	1.17	0.13	0.65	1.29	0.20
Uniform Delay, d1	60.3	28.9	26.4	66.1	41.7	27.4	68.0	47.2	32.2	68.1	48.5	34.6
Progression 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
Incremental Delay, d2	0.9	0.2	0.3	2.1	8.5	0.0	201.8	82.9	0.5	9.4	134.0	0.8
Delay (s)	61.3	29.2	26.7	68.2	50.2	27.5	269.8	130.1	32.7	77.6	182.4	35.5
Level of Service	E	C	C	E	D	C	F	F	C	E	F	D
Approach Delay (s)		33.1			50.5			142.0			164.8	
Approach LOS		C			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	111.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	15.1
Intersection Capacity Utilization	107.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	5	155	2133	1	128	2217
v/c Ratio	0.05	0.62	0.61	0.00	0.61	0.56
Control Delay	64.8	21.0	9.1	0.0	40.5	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.8	21.0	9.1	0.0	40.5	2.9
Queue Length 50th (m)	1.5	0.6	92.2	0.0	16.6	37.9
Queue Length 95th (m)	5.8	22.1	156.7	0.0	38.7	76.1
Internal Link Dist (m)		261.1	423.7			314.4
Turn Bay Length (m)	85.0			85.0	85.0	
Base Capacity (vph)	99	529	3493	1262	229	3975
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	0.05	0.29	0.61	0.00	0.56	0.56

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	5	0	155	0	2133	1	128	2217	0
Future Volume (vph)	0	0	0	5	0	155	0	2133	1	128	2217	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				3.5	2.6			5.6	5.6	3.5	5.6	
Lane Util. Factor				1.00	1.00			*0.80	1.00	1.00	*0.80	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1789	1601			4520	1601	1789	4520	
Flt Permitted				0.48	1.00			1.00	1.00	0.04	1.00	
Satd. Flow (perm)				906	1601			4520	1601	77	4520	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	5	0	155	0	2133	1	128	2217	0
RTOR Reduction (vph)	0	0	0	0	138	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	5	17	0	0	2133	1	128	2217	0
Turn Type	pm+pt			pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)				12.4	12.4			109.4	109.4	125.4	125.4	
Effective Green, g (s)				13.4	14.4			111.4	111.4	126.4	127.4	
Actuated g/C Ratio				0.09	0.10			0.74	0.74	0.84	0.85	
Clearance Time (s)				4.5	4.6			7.6	7.6	4.5	7.6	
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				103	153			3356	1189	207	3838	
v/s Ratio Prot				0.00	c0.01			c0.47		0.05	c0.49	
v/s Ratio Perm				0.00					0.00	0.47		
v/c Ratio				0.05	0.11			0.64	0.00	0.62	0.58	
Uniform Delay, d1				62.4	61.9			9.4	5.0	35.6	3.3	
Progression Factor				1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2				0.2	0.3			0.9	0.0	5.4	0.6	
Delay (s)				62.6	62.3			10.3	5.0	41.0	4.0	
Level of Service				E	E			B	A	D	A	
Approach Delay (s)		0.0			62.3			10.3			6.0	
Approach LOS		A			E			B			A	

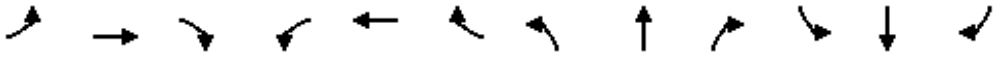
Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	15.2
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	WBL	WBT	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	271	107	2028	100	199	2023
v/c Ratio	0.77	0.22	0.87	0.12	0.68	0.67
Control Delay	52.2	6.7	30.4	5.0	35.0	13.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.2	6.7	30.4	5.0	35.0	13.4
Queue Length 50th (m)	54.1	0.5	162.7	1.4	23.5	98.6
Queue Length 95th (m)	74.9	11.9	#217.7	10.5	#66.3	148.5
Internal Link Dist (m)		265.7	219.0			423.7
Turn Bay Length (m)	85.0			85.0	85.0	
Base Capacity (vph)	492	634	2319	863	293	3022
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	0.55	0.17	0.87	0.12	0.68	0.67

Intersection Summary

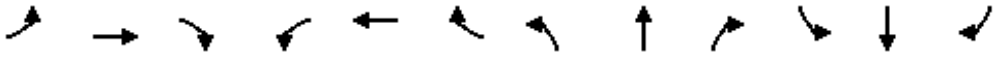
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	271	0	107	0	2028	100	199	2023	0
Future Volume (vph)	0	0	0	271	0	107	0	2028	100	199	2023	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				3.6	2.6			5.6	5.6	3.5	5.6	
Lane Util. Factor				1.00	1.00			*0.80	1.00	1.00	*0.80	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1789	1601			4520	1601	1789	4520	
Flt Permitted				0.76	1.00			1.00	1.00	0.07	1.00	
Satd. Flow (perm)				1426	1601			4520	1601	128	4520	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	271	0	107	0	2028	100	199	2023	0
RTOR Reduction (vph)	0	0	0	0	77	0	0	0	42	0	0	0
Lane Group Flow (vph)	0	0	0	271	30	0	0	2028	58	199	2023	0
Turn Type	Perm			Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)				26.3	26.3			54.4	54.4	71.5	71.5	
Effective Green, g (s)				27.3	28.3			56.4	56.4	72.5	73.5	
Actuated g/C Ratio				0.25	0.26			0.51	0.51	0.66	0.67	
Clearance Time (s)				4.6	4.6			7.6	7.6	4.5	7.6	
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				353	411			2317	820	289	3020	
v/s Ratio Prot					0.02			c0.45		0.08	c0.45	
v/s Ratio Perm				c0.19					0.04	0.37		
v/c Ratio				0.77	0.07			0.88	0.07	0.69	0.67	
Uniform Delay, d1				38.4	30.9			23.7	13.5	28.9	11.0	
Progression Factor				1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2				9.6	0.1			5.0	0.2	6.7	1.2	
Delay (s)				48.0	31.0			28.7	13.7	35.6	12.2	
Level of Service				D	C			C	B	D	B	
Approach Delay (s)		0.0			43.2			28.0			14.3	
Approach LOS		A			D			C			B	

Intersection Summary			
HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.7
Intersection Capacity Utilization	76.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

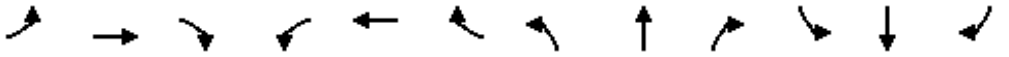


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	304	111	95	361	32	18	44	2020	201	45	2077	60
v/c Ratio	0.85	0.50	0.38	1.10	0.13	0.07	0.30	0.74	0.20	0.30	0.76	0.06
Control Delay	65.1	59.7	13.5	121.5	48.3	0.5	12.4	20.8	4.7	12.6	21.5	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.1	59.7	13.5	121.5	48.3	0.5	12.4	20.8	4.7	12.6	21.5	1.8
Queue Length 50th (m)	67.2	26.1	0.0	~88.6	7.0	0.0	3.2	145.9	6.3	3.3	153.5	0.0
Queue Length 95th (m)	#113.4	44.7	14.6	#114.1	16.5	0.0	7.8	183.6	18.0	8.0	193.0	4.0
Internal Link Dist (m)		189.2			233.6			642.4			323.5	
Turn Bay Length (m)	85.0		85.0	85.0		85.0	85.0		85.0	85.0		85.0
Base Capacity (vph)	359	595	549	328	633	579	149	2720	1018	149	2720	994
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	0.85	0.19	0.17	1.10	0.05	0.03	0.30	0.74	0.20	0.30	0.76	0.06

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

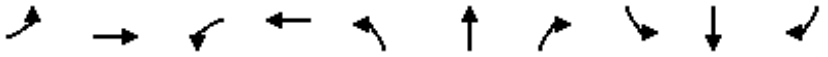
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	304	111	95	361	32	18	44	2020	201	45	2077	60
Future Volume (vph)	304	111	95	361	32	18	44	2020	201	45	2077	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	2.6	4.6	3.5	2.6	4.6	3.5	5.6	5.6	3.5	5.6	5.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	1883	1601	1789	1883	1601	1789	4520	1601	1789	4520	1601
Flt Permitted	0.69	1.00	1.00	0.50	1.00	1.00	0.05	1.00	1.00	0.05	1.00	1.00
Satd. Flow (perm)	1302	1883	1601	942	1883	1601	103	4520	1601	103	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	304	111	95	361	32	18	44	2020	201	45	2077	60
RTOR Reduction (vph)	0	0	85	0	0	16	0	0	56	0	0	24
Lane Group Flow (vph)	304	111	10	361	32	2	44	2020	145	45	2077	36
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	29.1	13.7	13.7	27.3	12.8	12.8	76.4	72.5	72.5	76.4	72.5	72.5
Effective Green, g (s)	31.1	15.7	13.7	29.3	14.8	12.8	78.4	74.5	74.5	78.4	74.5	74.5
Actuated g/C Ratio	0.25	0.12	0.11	0.23	0.12	0.10	0.62	0.59	0.59	0.62	0.59	0.59
Clearance Time (s)	4.5	4.6	4.6	4.5	4.6	4.6	4.5	7.6	7.6	4.5	7.6	7.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	385	235	174	323	221	162	129	2676	948	129	2676	948
v/s Ratio Prot	0.10	0.06		c0.14	0.02		0.01	0.45		c0.01	c0.46	
v/s Ratio Perm	0.09		0.01	c0.12		0.00	0.20		0.09	0.20		0.02
v/c Ratio	0.79	0.47	0.06	1.12	0.14	0.01	0.34	0.75	0.15	0.35	0.78	0.04
Uniform Delay, d1	43.1	51.2	50.3	46.6	49.8	50.8	17.7	18.9	11.5	16.9	19.4	10.7
Progression 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
Incremental Delay, d2	10.3	1.5	0.1	85.7	0.3	0.0	1.6	2.0	0.3	1.6	2.3	0.1
Delay (s)	53.5	52.7	50.4	132.2	50.1	50.8	19.3	20.9	11.8	18.6	21.6	10.8
Level of Service	D	D	D	F	D	D	B	C	B	B	C	B
Approach Delay (s)		52.7			122.3			20.1			21.3	
Approach LOS		D			F			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	125.8	Sum of lost time (s)	15.2
Intersection Capacity Utilization	77.8%	ICU Level of Service	D
Analysis Period (min)	15		

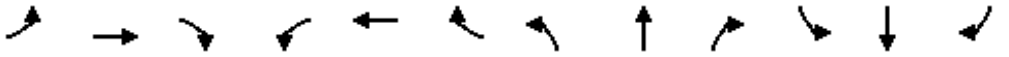
c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	177	283	10	115	155	1995	6	117	2336	36
v/c Ratio	0.85	0.63	0.13	0.28	0.74	0.70	0.01	0.60	0.83	0.04
Control Delay	86.0	29.8	49.0	10.5	53.9	20.1	0.0	38.9	25.3	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.0	29.8	49.0	10.5	53.9	20.1	0.0	38.9	25.3	2.9
Queue Length 50th (m)	47.6	34.5	2.3	1.6	25.1	144.3	0.0	14.9	205.7	0.0
Queue Length 95th (m)	75.6	64.4	7.8	17.0	#60.9	207.8	0.0	37.7	274.7	4.0
Internal Link Dist (m)		265.1		307.9		467.3			642.4	
Turn Bay Length (m)	85.0		85.0		85.0		85.0	85.0		85.0
Base Capacity (vph)	291	563	106	535	230	2852	1026	244	2816	1014
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.50	0.09	0.21	0.67	0.70	0.01	0.48	0.83	0.04

Intersection Summary

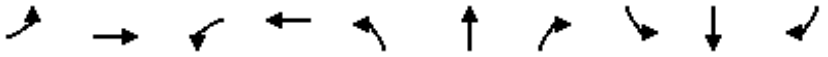
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	177	19	264	10	7	108	155	1995	6	117	2336	36
Future Volume (vph)	177	19	264	10	7	108	155	1995	6	117	2336	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.6	2.6		3.6	2.6		3.5	5.6	5.6	3.5	5.6	5.6
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	0.86		1.00	0.86		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	1620		1789	1618		1789	4520	1601	1789	4520	1601
Flt Permitted	0.56	1.00		0.20	1.00		0.05	1.00	1.00	0.05	1.00	1.00
Satd. Flow (perm)	1057	1620		383	1618		87	4520	1601	88	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	177	19	264	10	7	108	155	1995	6	117	2336	36
RTOR Reduction (vph)	0	116	0	0	86	0	0	0	2	0	0	14
Lane Group Flow (vph)	177	167	0	10	29	0	155	1995	4	117	2336	22
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	26.4	26.4		26.4	26.4		96.2	85.3	85.3	94.0	84.2	84.2
Effective Green, g (s)	27.4	28.4		27.4	28.4		98.2	87.3	87.3	96.0	86.2	86.2
Actuated g/C Ratio	0.20	0.21		0.20	0.21		0.71	0.63	0.63	0.69	0.62	0.62
Clearance Time (s)	4.6	4.6		4.6	4.6		4.5	7.6	7.6	4.5	7.6	7.6
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	209	332		75	332		208	2855	1011	194	2819	998
v/s Ratio Prot		0.10			0.02		c0.06	0.44		0.05	c0.52	
v/s Ratio Perm	c0.17			0.03			0.46		0.00	0.37		0.01
v/c Ratio	0.85	0.50		0.13	0.09		0.75	0.70	0.00	0.60	0.83	0.02
Uniform Delay, d1	53.4	48.6		45.6	44.4		40.5	16.8	9.4	28.8	20.2	9.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	25.8	1.2		0.8	0.1		13.5	1.4	0.0	5.2	3.0	0.0
Delay (s)	79.2	49.8		46.4	44.5		54.0	18.2	9.4	34.0	23.2	10.0
Level of Service	E	D		D	D		D	B	A	C	C	A
Approach Delay (s)		61.1			44.7			20.8			23.5	
Approach LOS		E			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	138.2	Sum of lost time (s)	11.7
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		

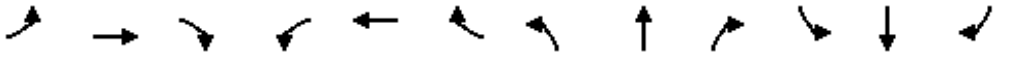
c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	140	162	112	72	121	1945	130	109	2370	130
v/c Ratio	0.71	0.47	0.90	0.22	0.55	0.66	0.12	0.52	0.81	0.12
Control Delay	65.6	24.9	106.3	10.5	28.2	15.7	2.6	26.5	20.6	3.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.6	24.9	106.3	10.5	28.2	15.7	2.6	26.5	20.6	3.7
Queue Length 50th (m)	31.6	16.0	26.2	0.2	10.6	105.8	0.6	7.9	156.2	2.1
Queue Length 95th (m)	49.5	33.8	#47.8	11.6	30.9	166.7	9.4	27.6	#265.4	11.9
Internal Link Dist (m)		318.3		354.6		485.6			467.3	
Turn Bay Length (m)	85.0		85.0		85.0		85.0	85.0		85.0
Base Capacity (vph)	389	579	244	569	222	2941	1084	211	2913	1068
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.28	0.46	0.13	0.55	0.66	0.12	0.52	0.81	0.12

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	140	3	159	112	1	71	121	1945	130	109	2370	130
Future Volume (vph)	140	3	159	112	1	71	121	1945	130	109	2370	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.6	2.6		3.6	2.6		3.5	5.6	5.6	3.5	5.6	5.6
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	0.85		1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	1606		1789	1605		1789	4520	1601	1789	4520	1601
Flt Permitted	0.65	1.00		0.41	1.00		0.05	1.00	1.00	0.05	1.00	1.00
Satd. Flow (perm)	1231	1606		772	1605		98	4520	1601	99	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	140	3	159	112	1	71	121	1945	130	109	2370	130
RTOR Reduction (vph)	0	71	0	0	59	0	0	0	43	0	0	36
Lane Group Flow (vph)	140	91	0	112	13	0	121	1945	87	109	2370	94
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	18.4	18.4		18.4	18.4		85.7	76.1	76.1	84.1	75.3	75.3
Effective Green, g (s)	19.4	20.4		19.4	20.4		87.7	78.1	78.1	86.1	77.3	77.3
Actuated g/C Ratio	0.16	0.17		0.16	0.17		0.73	0.65	0.65	0.72	0.64	0.64
Clearance Time (s)	4.6	4.6		4.6	4.6		4.5	7.6	7.6	4.5	7.6	7.6
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	199	273		124	272		220	2941	1041	209	2911	1031
v/s Ratio Prot		0.06			0.01		c0.05	0.43		0.04	c0.52	
v/s Ratio Perm	0.11			c0.15			0.35		0.05	0.33		0.06
v/c Ratio	0.70	0.33		0.90	0.05		0.55	0.66	0.08	0.52	0.81	0.09
Uniform Delay, d1	47.6	43.8		49.4	41.7		26.0	12.8	7.7	17.6	16.0	8.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.7	0.7		51.9	0.1		3.0	1.2	0.2	2.3	2.6	0.2
Delay (s)	58.3	44.6		101.3	41.7		29.0	14.0	7.9	19.9	18.6	8.2
Level of Service	E	D		F	D		C	B	A	B	B	A
Approach Delay (s)		50.9			78.0			14.5			18.1	
Approach LOS		D			E			B			B	

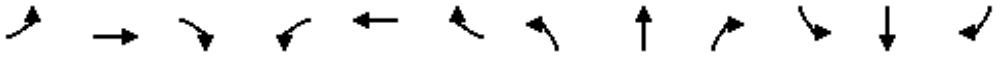
Intersection Summary			
HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.7
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	201	46	46	76	2124	8	14	2654
v/c Ratio	0.73	0.88	0.16	0.48	0.61	0.01	0.10	0.81
Control Delay	57.6	157.6	6.1	30.5	9.5	0.0	5.1	18.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.6	157.6	6.1	30.5	9.5	0.0	5.1	18.2
Queue Length 50th (m)	41.3	13.6	0.0	5.6	82.5	0.0	0.6	196.4
Queue Length 95th (m)	65.1	#33.1	6.1	23.5	167.6	0.0	2.6	299.4
Internal Link Dist (m)	271.9		333.5		436.2			485.6
Turn Bay Length (m)		85.0		85.0		85.0	85.0	
Base Capacity (vph)	460	98	465	157	3508	1252	146	3263
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.47	0.10	0.48	0.61	0.01	0.10	0.81

Intersection Summary

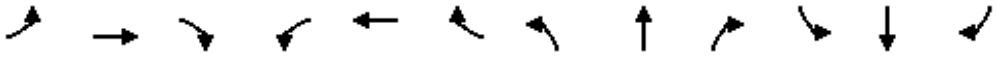
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1	200	46	0	46	76	2124	8	14	2654	0
Future Volume (vph)	0	1	200	46	0	46	76	2124	8	14	2654	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		2.6		3.6	2.6		3.5	5.6	5.6	3.5	5.6	
Lane Util. Factor		1.00		1.00	1.00		1.00	*0.80	1.00	1.00	*0.80	
Frt		0.85		1.00	0.85		1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1602		1789	1601		1789	4520	1601	1789	4520	
Flt Permitted		1.00		0.21	1.00		0.04	1.00	1.00	0.05	1.00	
Satd. Flow (perm)		1602		389	1601		68	4520	1601	88	4520	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1	200	46	0	46	76	2124	8	14	2654	0
RTOR Reduction (vph)	0	51	0	0	39	0	0	0	2	0	0	0
Lane Group Flow (vph)	0	150	0	46	7	0	76	2124	6	14	2654	0
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		19.2		19.2	19.2		118.6	111.7	111.7	108.7	106.3	
Effective Green, g (s)		21.2		20.2	21.2		119.6	113.7	113.7	110.7	108.3	
Actuated g/C Ratio		0.14		0.13	0.14		0.80	0.76	0.76	0.74	0.72	
Clearance Time (s)		4.6		4.6	4.6		4.5	7.6	7.6	4.5	7.6	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		226		52	226		155	3426	1213	103	3263	
v/s Ratio Prot		0.09			0.00		c0.03	0.47		0.00	c0.59	
v/s Ratio Perm				c0.12			0.36		0.00	0.10		
v/c Ratio		0.67		0.88	0.03		0.49	0.62	0.00	0.14	0.81	
Uniform Delay, d1		61.0		63.8	55.5		31.3	8.3	4.4	7.4	14.0	
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		7.2		82.7	0.1		2.4	0.9	0.0	0.6	2.3	
Delay (s)		68.2		146.5	55.6		33.7	9.1	4.4	8.0	16.4	
Level of Service		E		F	E		C	A	A	A	B	
Approach Delay (s)		68.2			101.0			10.0			16.3	
Approach LOS		E			F			A			B	

Intersection Summary			
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	11.7
Intersection Capacity Utilization	86.8%	ICU Level of Service	E
Analysis Period (min)	15		

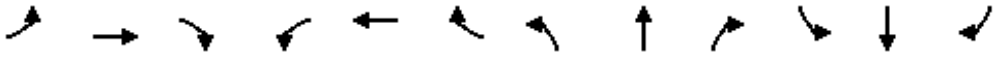
c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	90	11	266	41	34	242	200	1876	101	119	2482	300
v/c Ratio	0.37	0.04	0.76	0.16	0.14	0.76	0.89	0.66	0.10	0.61	0.89	0.28
Control Delay	47.7	47.2	35.1	42.6	49.3	34.3	72.1	17.2	3.9	36.4	27.1	5.8
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	47.7	47.2	35.1	42.6	49.3	34.3	72.1	17.2	3.9	36.4	27.1	5.8
Queue Length 50th (m)	19.3	2.5	24.0	8.6	7.7	19.3	33.8	117.2	1.9	11.9	206.8	12.1
Queue Length 95th (m)	34.1	7.9	54.2	18.4	17.3	47.5	#87.9	167.5	10.2	35.4	#298.4	30.5
Internal Link Dist (m)		291.2			376.2			390.5			436.2	
Turn Bay Length (m)	85.0		85.0	85.0		85.0	85.0		85.0	85.0		85.0
Base Capacity (vph)	246	578	585	252	578	580	224	2859	1042	215	2782	1053
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	0.37	0.02	0.45	0.16	0.06	0.42	0.89	0.66	0.10	0.55	0.89	0.28

Intersection Summary

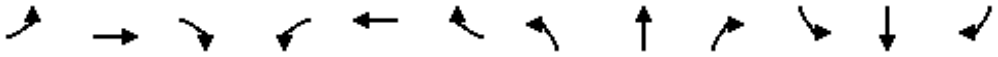
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	11	266	41	34	242	200	1876	101	119	2482	300
Future Volume (vph)	90	11	266	41	34	242	200	1876	101	119	2482	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	2.6	4.6	3.5	2.6	4.6	3.5	5.6	5.6	3.5	5.6	5.6
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	1883	1601	1789	1883	1601	1789	4520	1601	1789	4520	1601
Flt Permitted	0.69	1.00	1.00	0.75	1.00	1.00	0.05	1.00	1.00	0.05	1.00	1.00
Satd. Flow (perm)	1295	1883	1601	1413	1883	1601	95	4520	1601	97	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	90	11	266	41	34	242	200	1876	101	119	2482	300
RTOR Reduction (vph)	0	0	147	0	0	142	0	0	30	0	0	69
Lane Group Flow (vph)	90	11	119	41	34	100	200	1876	71	119	2482	231
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	21.1	16.1	16.1	18.9	15.0	15.0	89.1	78.5	78.5	84.9	76.4	76.4
Effective Green, g (s)	23.1	18.1	16.1	20.9	17.0	15.0	91.1	80.5	80.5	86.9	78.4	78.4
Actuated g/C Ratio	0.18	0.14	0.13	0.16	0.13	0.12	0.71	0.63	0.63	0.68	0.61	0.61
Clearance Time (s)	4.5	4.6	4.6	4.5	4.6	4.6	4.5	7.6	7.6	4.5	7.6	7.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	256	265	201	244	249	187	220	2838	1005	191	2764	979
v/s Ratio Prot	c0.02	0.01		0.01	0.02		c0.08	0.42		0.05	0.55	
v/s Ratio Perm	0.05		c0.07	0.02		0.06	c0.56		0.04	0.37		0.14
v/c Ratio	0.35	0.04	0.59	0.17	0.14	0.53	0.91	0.66	0.07	0.62	0.90	0.24
Uniform Delay, d1	45.4	47.6	53.0	46.0	49.1	53.3	42.9	15.2	9.3	23.4	21.5	11.3
Progression 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
Incremental Delay, d2	0.8	0.1	4.6	0.3	0.3	2.9	36.4	1.2	0.1	6.2	5.2	0.6
Delay (s)	46.2	47.6	57.6	46.3	49.4	56.2	79.2	16.4	9.4	29.6	26.6	11.9
Level of Service	D	D	E	D	D	E	E	B	A	C	C	B
Approach Delay (s)		54.5			54.2			21.8			25.2	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	128.2	Sum of lost time (s)	15.2
Intersection Capacity Utilization	82.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

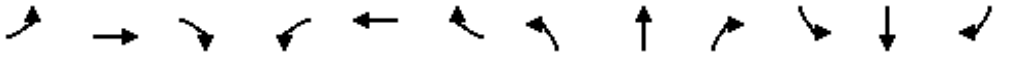


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	120	1567	458	481	1863	547	339	1095	563	287	1398	148
v/c Ratio	0.68	1.00	0.66	1.01	0.95	0.57	1.01	0.83	0.71	0.80	1.03	0.26
Control Delay	86.3	70.4	26.1	104.0	52.1	19.7	115.9	53.8	32.3	80.4	81.3	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.3	70.4	26.1	104.0	52.1	19.7	115.9	53.8	32.3	80.4	81.3	10.4
Queue Length 50th (m)	17.7	~188.5	61.7	~72.7	212.9	84.7	~51.7	122.4	112.8	42.2	~178.3	5.1
Queue Length 95th (m)	#30.7	#228.5	100.8	#109.1	#252.9	119.0	#83.9	143.2	157.6	#62.4	#212.1	21.5
Internal Link Dist (m)		1711.9			759.7			657.0			690.8	
Turn Bay Length (m)	130.0		110.0	300.0		70.0	110.0		70.0	130.0		85.0
Base Capacity (vph)	177	1561	694	478	1951	952	335	1327	794	359	1358	571
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	0.68	1.00	0.66	1.01	0.95	0.57	1.01	0.83	0.71	0.80	1.03	0.26

Intersection Summary

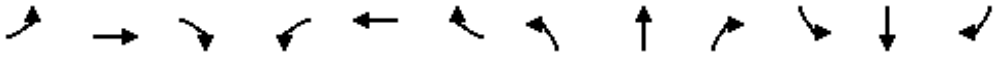
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	1567	458	481	1863	547	339	1095	563	287	1398	148
Future Volume (vph)	120	1567	458	481	1863	547	339	1095	563	287	1398	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.4	5.4	3.0	5.4	2.0	3.0	5.0	2.0	3.0	5.0	5.0
Lane Util. Factor	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00	0.97	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3219	4476	1601	3471	4520	1601	3471	4476	1601	3471	4476	1601
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3219	4476	1601	3471	4520	1601	3471	4476	1601	3471	4476	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	120	1567	458	481	1863	547	339	1095	563	287	1398	148
RTOR Reduction (vph)	0	0	135	0	0	27	0	0	35	0	0	86
Lane Group Flow (vph)	120	1567	323	481	1863	520	339	1095	528	287	1398	62
Heavy Vehicles (%)	10%	3%	2%	2%	2%	2%	2%	3%	2%	2%	3%	2%
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2		1	6	7	3	8	1	7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	7.0	48.6	48.6	19.0	60.6	74.6	13.0	41.0	60.0	14.0	42.0	42.0
Effective Green, g (s)	8.0	50.6	50.6	20.0	62.6	78.6	14.0	43.0	64.0	15.0	44.0	44.0
Actuated g/C Ratio	0.06	0.35	0.35	0.14	0.43	0.54	0.10	0.30	0.44	0.10	0.30	0.30
Clearance Time (s)	4.0	7.4	7.4	4.0	7.4	4.0	4.0	7.0	4.0	4.0	7.0	7.0
Vehicle Extension (s)	5.0	3.0	3.0	5.0	3.0	4.0	4.0	5.0	5.0	4.0	5.0	5.0
Lane Grp Cap (vph)	177	1561	558	478	1951	867	335	1327	706	359	1358	485
v/s Ratio Prot	0.04	c0.35		c0.14	0.41	0.07	c0.10	0.24	0.11	0.08	c0.31	
v/s Ratio Perm			0.20			0.26			0.22			0.04
v/c Ratio	0.68	1.00	0.58	1.01	0.95	0.60	1.01	0.83	0.75	0.80	1.03	0.13
Uniform Delay, d1	67.2	47.2	38.5	62.5	39.8	22.5	65.5	47.5	33.8	63.5	50.5	36.6
Progression 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
Incremental Delay, d2	12.7	23.7	1.5	42.7	11.5	1.3	52.2	6.0	5.2	12.4	32.3	0.5
Delay (s)	79.9	70.9	40.0	105.2	51.3	23.8	117.7	53.5	39.0	75.9	82.8	37.1
Level of Service	E	E	D	F	D	C	F	D	D	E	F	D
Approach Delay (s)		64.8			55.1			60.3			78.0	
Approach LOS		E			E			E			E	

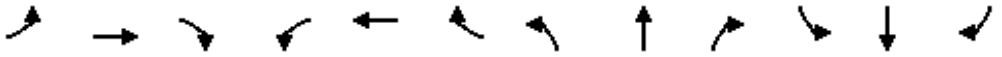
Intersection Summary			
HCM 2000 Control Delay	63.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	96.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	82	92	132	252	179	311	209	2098	264	192	1644	103
v/c Ratio	0.29	0.17	0.39	0.80	0.30	0.76	0.76	0.81	0.27	0.83	0.66	0.11
Control Delay	41.5	47.6	10.9	64.8	48.5	32.1	48.8	27.0	7.6	61.6	23.9	3.3
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	41.5	47.6	10.9	64.8	48.5	32.1	48.8	27.0	7.6	61.6	23.9	3.3
Queue Length 50th (m)	16.9	11.0	0.0	58.1	21.6	29.4	33.3	173.3	13.3	32.8	124.2	0.0
Queue Length 95th (m)	29.9	18.7	16.8	84.7	32.2	61.4	#74.7	243.7	33.6	#83.3	174.0	8.9
Internal Link Dist (m)		1074.9			770.5			396.6			272.1	
Turn Bay Length (m)	85.0		85.0	120.0		85.0	170.0		70.0	170.0		70.0
Base Capacity (vph)	278	1042	546	315	1101	605	302	2582	978	237	2491	930
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	0.29	0.09	0.24	0.80	0.16	0.51	0.69	0.81	0.27	0.81	0.66	0.11

Intersection Summary

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



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	82	92	132	252	179	311	209	2098	264	192	1644	103
Future Volume (vph)	82	92	132	252	179	311	209	2098	264	192	1644	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.5	3.2	5.2	3.0	3.2	5.2	3.0	5.8	5.8	3.0	5.8	5.8
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	*0.80	1.00	1.00	*0.80	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1789	3510	1601	1789	3579	1601	1789	4520	1601	1789	4520	1601
Flt Permitted	0.59	1.00	1.00	0.65	1.00	1.00	0.06	1.00	1.00	0.06	1.00	1.00
Satd. Flow (perm)	1119	3510	1601	1221	3579	1601	114	4520	1601	105	4520	1601
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	82	92	132	252	179	311	209	2098	264	192	1644	103
RTOR Reduction (vph)	0	0	113	0	0	164	0	0	63	0	0	46
Lane Group Flow (vph)	82	92	19	252	179	147	209	2098	201	192	1644	57
Heavy Vehicles (%)	2%	4%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	8		3	4		5	2		1	6	
Permitted Phases	8		8	4		4	2		2	6		6
Actuated Green, G (s)	23.8	18.7	18.7	27.1	20.1	20.1	87.7	73.3	73.3	82.3	70.6	70.6
Effective Green, g (s)	27.8	20.7	18.7	29.1	22.1	20.1	89.7	75.3	75.3	84.3	72.6	72.6
Actuated g/C Ratio	0.21	0.16	0.14	0.22	0.17	0.15	0.68	0.57	0.57	0.64	0.55	0.55
Clearance Time (s)	4.5	5.2	5.2	4.0	5.2	5.2	4.0	7.8	7.8	4.0	7.8	7.8
Vehicle Extension (s)	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0	3.0	5.0	5.0
Lane Grp Cap (vph)	272	551	227	304	600	244	273	2584	915	229	2491	882
v/s Ratio Prot	0.02	0.03		c0.05	0.05		c0.09	c0.46		c0.08	0.36	
v/s Ratio Perm	0.05		0.01	c0.13		0.09	0.43		0.13	0.45		0.04
v/c Ratio	0.30	0.17	0.08	0.83	0.30	0.60	0.77	0.81	0.22	0.84	0.66	0.06
Uniform Delay, d1	43.0	48.0	49.1	48.1	48.0	52.1	35.1	22.5	13.8	38.5	20.8	13.7
Progression 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
Incremental Delay, d2	0.6	0.3	0.3	16.8	0.6	6.0	12.1	2.9	0.6	22.6	1.4	0.1
Delay (s)	43.6	48.3	49.4	64.8	48.6	58.1	47.1	25.4	14.4	61.2	22.2	13.9
Level of Service	D	D	D	E	D	E	D	C	B	E	C	B
Approach Delay (s)		47.5			58.1			26.1			25.6	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	131.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	88.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			