Park Place
Residential Development
Traffic Impact Study

Paradigm Transportation Solutions Limited

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Project Summary

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Executive Summary

Content

Park Place refers to a large development site located to the east of Highway 400 and generally between Mapleview Drive and Big Bay Point Road in the City of Barrie.

This Traffic Impact Study has been authored in support of Official Plan Amendment (OPA) and Zoning By-law Amendment (ZBA) applications sought for a proposed residential intensification development within the Park Place retail village lands.

This TIS builds upon previously accepted analyses conducted to facilitate development of the remaining Park Place lands. Specifically, the Park Place Stage 2 Traffic Impact Study authored by Paradigm (March 2020) was accepted by MTO and the City in July 2020. It was noted the TIS confirmed to MTO's satisfaction that highway improvements are not required as related to Park Place to the 2031 horizon year, provided that future applications for MTO Building and Land Use permits are in conformance with the land uses and building sizes depicted by the Park Place Site Plans.

Per the Terms of Reference (TOR) agreed upon with the City of Barrie and MTO this TIS builds upon the previously completed work for consistency.

Traffic forecasts and analysis have been completed for three future horizon years, 2026, 2031, and 2036. The analysis periods include the weekday AM and PM peak hours, which is consistent with past transportation studies for Park Place that focused on the weekday PM peak hour.

Conclusions

In consideration of the development previously analyzed within the Park Place Stage 2 TIS, inclusion of the proposed development of the Park Place North Lands, and the proposed residential development, the conclusions of the Traffic Impact Study are as follows:

- Consistent with the many past traffic studies conducted for Park Place since 2007, the weekday PM peak hour represents the design condition for assessing the overall traffic impact on the roadways and intersections in proximity to the site;
- Two development parcels previously contemplated for retail development are now proposed to be intensified through the

provision of high-density residential dwellings and supporting ancillary retail-commercial uses within the South Lands. The proposed development is anticipated to generate approximately 175 and 366 vehicular trips under the AM and PM peak hours, respectively.

In comparison to the original retail proposal, the proposed residential development would generate an additional 122 and 62 vehicle trips under the AM and PM peak hours, respectively.

Vehicular access to the South Lands will remain as existing with no changes to the number or location of site accesses proposed.

The overall impact of the proposed residential development on the adjacent transportation network is minor. The additional vehicular trips generated under the AM and PM peak hours are found not to trigger any improvements beyond those suggested to accommodate the background traffic forecasts. Effectively, the outcomes and findings of the Park Place Stage 2 (March 2020) TIS remain applicable;

- The estimated vehicular trip generation does not account for any modal split reductions. It is expected if a transit modal split reduction is applied there would be reduction of vehicular trips generated;
- The Mapleview Drive and Bayview Drive intersections are built out in terms of their physical design, but there are relatively minor improvements that could be made to increase their capacity. These include adjustments to signal phasing and timing (i.e., Maple view Drive/Park Place Boulevard-Costco Access);
- Due to several significant planned and under construction improvements to the road network adjacent to Park Place, including the recently completed Harvie Road-Big Bay Point Road flyover of Highway 400 which provides an east-west alternative to the Mapleview Drive corridor, the modeling forecasts generated from the Park Place Stage 2 (March 2020) TIS were utilized as they accounted for the redistribution of traffic resulting from the planned transportation improvements;
- For the 2026 horizon year, the analysis of the PM peak hour showed significantly higher traffic volumes in the Harvie Road-Big Bay Point Road corridor (but within capacity) and that operations along the Mapleview Drive corridor would slightly improve due to reductions in the volume of key traffic movements (i.e., eastbound left turn movements to Park Place and some Highway 400 off ramp turning movements).

With the provision of the Harvie Road-Big Bay Point Road flyover, diversion of traffic is noted. As motorists become more familiar with the improved transportation road network, the under utilized Harvie Road-Big Bay Point Road corridor will likely attract higher traffic volumes than those in the forecasts. The diversion of more peak period traffic to new alternative routes will also assist in maintaining Mapleview Drive corridor traffic volume demands within capacity;

- Relatively minor operational improvements as identified in the TIS could be implemented to maintain and/or improve peak hour conditions at several key intersections in the Mapleview Drive corridor. The aforementioned improvements are the same measures as identified from the Park Place Stage 2 (March 2020) TIS. The proposed residential development within the South Lands would not trigger the need for any additional improvements.

  Further, it is our understanding that the City of Barrie is intending to conduct a detailed study of the Mapleview Drive corridor to develop and evaluate shorter term operational and design alternatives that will better serve automobile, truck, transit, bicycle, and pedestrian travel demands within this corridor while complementing the longer term implementation of the MTO-recommended Diverging Diamond Interchange (DDI);

- For the 2031 and 2036 horizon years, by which several more larger transportation network improvements in addition to the Harvie Road-Big Bay Point Road flyover would be implemented, resulting in additional improvement in traffic operations; however, would be offset by background traffic growth.

  That is, due to a noticeable change in trip patterns in the model forecasts there is less reliance on the Mapleview Drive/Highway 400 interchange. However, accounting for background growth there continues to be relatively significant traffic volume demands in the Mapleview Drive corridor. The operational results indicate that the corridor is forecast to operate within or near capacity; however, as motorists become more familiar with the improved overall transportation road network, the new underutilized transportation links and corridors will likely attract higher traffic volumes than those in the forecasts as evidenced in the data collected for the Harvie Road-Big Bay Point corridor;

- The analysis of the 2031 and 2036 traffic forecasts with the MTO and City-recommended DDI configuration at Mapleview Drive/Highway 400 and with the existing Diamond Interchange configuration confirmed that the DDI would represent an

improvement in traffic operations at the ramp terminal intersections.

It should be understood; however, that the improved operations at the interchange will not likely carry over to the adjacent Mapleview Drive intersections during the busiest conditions. The traffic reporting that was part of the MTO 2017 Transportation Environmental Study Report, where this design was identified as the preferred alternative, concluded that the PM peak hour traffic operations of adjacent intersections would be independent of the configuration of the interchange – i.e., the implementation of the DDI neither improves nor worsens the traffic operations at other intersections in the study area section of the Mapleview Drive corridor, it only improves ramp terminal operations;

- As timing for the implementation of the DDI is uncertain, the existing Diamond Interchange is forecast to provide acceptable traffic operations for the forecast 2031 and 2036 traffic conditions; and
- Future traffic conditions without the DDI at Highway 400 and Mapleview Drive are found to operate at acceptable conditions under the forecast 2031 and 2036 traffic conditions; however, operations would be improved under the DDI configuration.

Recommendations

The recommendations of the Traffic Impact Study are as follows:

- The proposed residential development within the Park Place South Lands should be approved, and this recommendation is supported by the following points:
  - Significant road network capacity has been provided adjacent to Park Place by the recent construction of the Harvie Road-Big Bay Point Road flyover of Highway 400.

    Additional road network capacity will also be provided adjacent to Park Place by the Bryne Drive extension (southerly portion between Caplan Avenue and Harvie Road). Construction is anticipated to begin in 2022;
  - Shorter term operational improvements identified in this study and those that will be determined through the City's upcoming Mapleview Drive corridor study that can be implemented in the Mapleview Drive corridor in conjunction with the continued development within Park Place; and

- The City's 2019 Transportation Master Plan (TMP) has identified several road network improvements that are anticipated to be implemented by 2031 including projects that will directly and indirectly benefit traffic flow to and from Park Place.

- Consistent with the MTO recommendation for implementing the DDI at Highway 400 and Mapleview Drive as well as the City's 2019 TMP recommendation for this same improvement to assist in accommodating future traffic forecasts, the DDI should be implemented as soon as practicable in order to realize the traffic operations and safety benefits to the interchange of this design compared to the existing Diamond Interchange configuration.

  Furthermore, as additional major external network improvements projects are completed (i.e., Essa interchange improvements, Bryne Drive extension – north and south portions, McKay interchange, Lockhart Road, etc.) interchange operations are anticipated to be improved.

  Notwithstanding, given the timing for implementation is uncertain the TIS identifies the existing Diamond Interchange configuration is forecast to operate acceptably up to the 2036 horizon year.

  It is recommended that MTO continue to monitor interchange ramp terminal volumes and associated operations along with the interchange off ramp queues.

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1 Introduction

1.1 Background

Park Place refers to a large development site located in the City of Barrie. **Figure 1.1** shows the site location, which is to the east of Highway 400 and generally between Mapleview Drive and Big Bay Point Road. The study area for the Traffic Impact Study (TIS) is also shown.

Since 2011, the Park Place lands have been developed primarily for retail-commercial uses, with the exceptions of a retirement residence, medical office, and a large IBM operations centre. In the near future, additional development will be constructed to complete and complement the existing development.

A TIS was previously completed by Paradigm (March 2020) to the satisfaction of the Ministry of Transporation Ontario (MTO) and the City of Barrie resulting in the partial removal of the Holding Provision allowing further development in Stage 2 to proceed.

Two development blocks previously contemplated for retail development are now proposed to be intensified through the provision of high-density residential dwellings and supporting ancillary retail-commercial uses.

1.2 Purpose

The purpose of this TIS is the support the Official Plan Amendment (OPA) and Zoning By-law Amendment (ZBA) applications sought.

The intent of this TIS is to account and assess traffic conditions of the development of Park Place, including the development of the North Lands, and the proposed development changes for the development parcel from retail to residential mixed-use.

Similar to the previous Stage 2 (March 2020) TIS, the key purposes of the TIS are as follows:

- Identify potential shorter term traffic operations improvements that could be considered in the Mapleview Drive corridor; and
- Consider the effect of longer term road network improvements on the efficiency and safety of traffic operations in the Mapleview Drive corridor and at the Highway 400/Mapleview Drive interchange, which would include accommodating additional development on the Park Place lands. These longer

term road network improvements have been identified in the City's 2019 Transportation Master Plan (TMP).

The forecasting and analysis of future conditions is also intended to address MTO TIS requirements for a longer term horizon year (2031 and 2036).

1.3 Scope and Methodology

A scope of work was prepared in consultation with City and MTO staff. **Appendix A** contains the correspondence for reference.

This TIS builds upon previously accepted analyses conducted to facilitate the development of remaining Park Place lands. Significant modeling work was previously undertaken to develop the future traffic forecasts. That is, model forecasts were utilized to determine the broader changes in the traffic patterns as related to future planned network improvements. A prime example would be the split of east-west traffic between Mapleview Drive and Harvie Road-Big Bay Point Road crossing over Highway 400.

Traffic forecasts have been completed for three future horizon years, 2026, 2031, and 2036 representing the anticipated build-out year for the North Lands, and five- and ten-years following build-out, respectively.

The analysis periods include the weekday AM and PM peak hours, which is generally consistent with past transportation studies for Park Place that focused on the weekday PM peak hour. In summary, the future traffic conditions include:

- <u>2026 Horizon Year:</u>
  - Background traffic comprising:
    - Non-Park Place traffic growth
    - 2021 Park Place trip generation (incremental site traffic for additional development plans to 2021, noting the proposed retail on the subject development parcels has been removed)
    - 2026 Park Place North Lands trip generation
  - Total traffic comprising:
    - 2026 background traffic
    - 2026 Park Place Residential trip generation (proposed development)

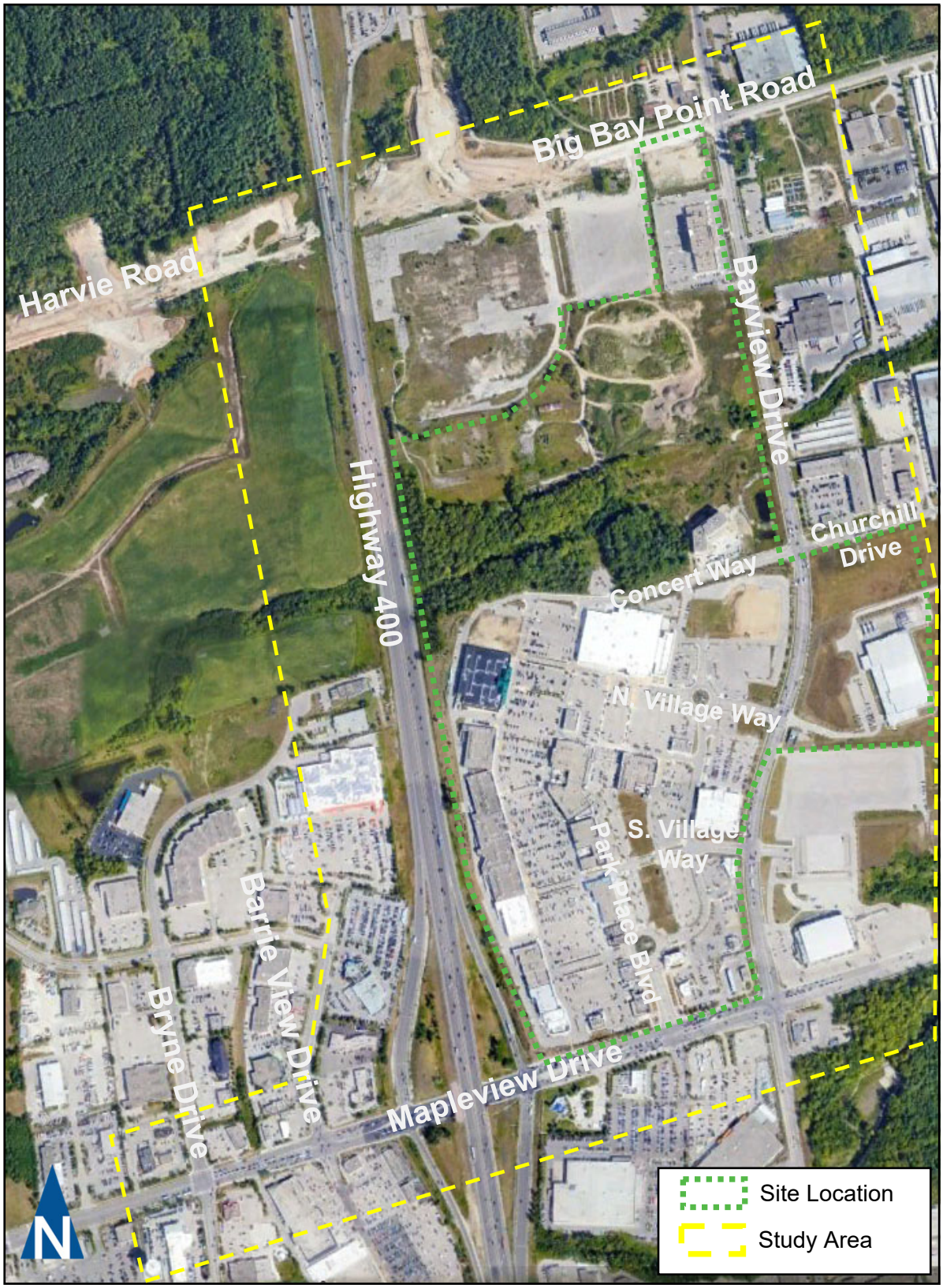
- 2031 Horizon Year (Five Years following Build-Out of North Lands):
  - Background traffic comprising:
    - Non-Park Place traffic growth
    - 2031 Park Place trip generation (incremental site traffic for additional development post-2021, noting the proposed retail on the subject development parcels has been removed)
    - 2026 Park Place North lands trip generation
  - Total traffic comprising:
    - 2031 background traffic
    - 2026 Park Place residential trip generation (proposed development)
- 2036 Horizon Year (10 Years following Build-Out of North Lands):
  - Background traffic comprising:
    - Non-Park Place traffic growth
    - 2031 Park Place trip generation (incremental site traffic for additional development post-2021)
    - 2026 Park Place North Lands trip generation
  - Total traffic comprising:
    - 2036 background traffic
    - 2026 Park Place Residential trip generation (proposed development)

It should be recognized from the outset that the scope and methodology for the subject study was customized to address the somewhat unique characteristics of the Park Place development, including its history and site context, and to acknowledge other completed studies by MTO and the City that have established longer term transportation network improvements. The relevant information considered as part of developing and completing the scope of work includes:

- The majority of the proposed retail development on the Park Place lands has been constructed, is operational today, and its traffic is being accommodated by the significant amount of transportation infrastructure put in place by the proponents of Park Place;

- Intensification of the development parcels previously contemplated as retail to high-density residential dwellings within the Park Place retail village South Lands is the focus of this study;
- In 2017, MTO completed the report, “Highway 400 Improvements from 1 km South of Highway 89 to the Junction of Highway 11, Transportation Environmental Study Report (TESR) Addendum, November 2017” (AECOM Canada Ltd.), which recommended that the existing Diamond Interchange at Highway 400 and Mapleview Drive be replaced with a Diverging Diamond Interchange (DDI). The proposed interchange design would increase capacity, improve traffic operations, and enhance safety at the ramp terminals; and
- The City’s 2019 TMP, which is an update of their 2014 Multi-Modal Active Transportation Master Plan (MMATMP), addresses the longer term transportation requirements for the City up to 2041.

  The City’s consultant, WSP Canada Inc., previously provided modeling assistance for the Stage 2 TIS study as necessary to address City-wide growth and changing travel patterns with the implementation of major new infrastructure.



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Site Location and Study Area
City of Barrie

Figure 1.1

2 Proposed Development

Aforementioned, this study builds upon previous traffic forecasts developed for the Stage 2 study. We have maintained the previous proposed land use/developments within the South Lands (Area 1) and East Lands (Area 2 and 3). The exception being the proposed development parcels within the South Lands.

The proposed intensified development are the development blocks denoted as Building 4-2 (situated on the north side of South Village Way just west of Live Eight Way) and a portion of Building 3-4 (situated on the south side of South Village Way just west of Live Eight Way) per the Park Place Conceptual Master Plan.

In summary, a total of 475 residential dwelling units along with 2,346 SM (25,254 SF) Gross Leasable Area (GLA) for retail-commercial use is proposed within the South Lands anticipated to be built-out in Horizon Year 2026.

Detailed development statistics are noted as follows:

- <u>Building A:</u>
  - 6-storey building;
  - 99 residential dwelling units;
  - 1,111 SM (11,960 SF) GLA retail space;
  - 161 car parking spaces; and
  - 50 bicycle parking spaces.
- <u>Building B:</u>
  - 16-storey building;
  - 197 residential dwelling units;
  - 195 SM (2,100 SF) GLA retail space;
  - 227 car parking spaces; and
  - 100 bicycle parking spaces.
- <u>Building C:</u>
  - 6- and 12-storey towers;
  - 179 residential dwelling units;
  - 1,040 SM (11,194 SF) GLA retail space;
  - 251 car parking spaces; and

- 90 bicycle parking spaces.

The proposed mixed-use residential development would be served by a total of 639 parking spaces with the majority of spaces provided within an underground structure.

Vehicular access to the South Lands will remain as existing with no changes to the number or location of site accesses proposed.

It is our understanding the proposed retail spaces within the residential buildings will be retail-commercial uses (typical shopping centre uses). These uses will likely be ancillary and supportive of the proposed residential development.

Figure 2.1 illustrates the proposed residential development site plan within the Park Place South Lands.

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Site Plan

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Figure 2.1

3 Existing Conditions

3.1 Roads and Traffic Control

Table 3.1 provides a summary of the key characteristics of the study area road network under existing conditions.

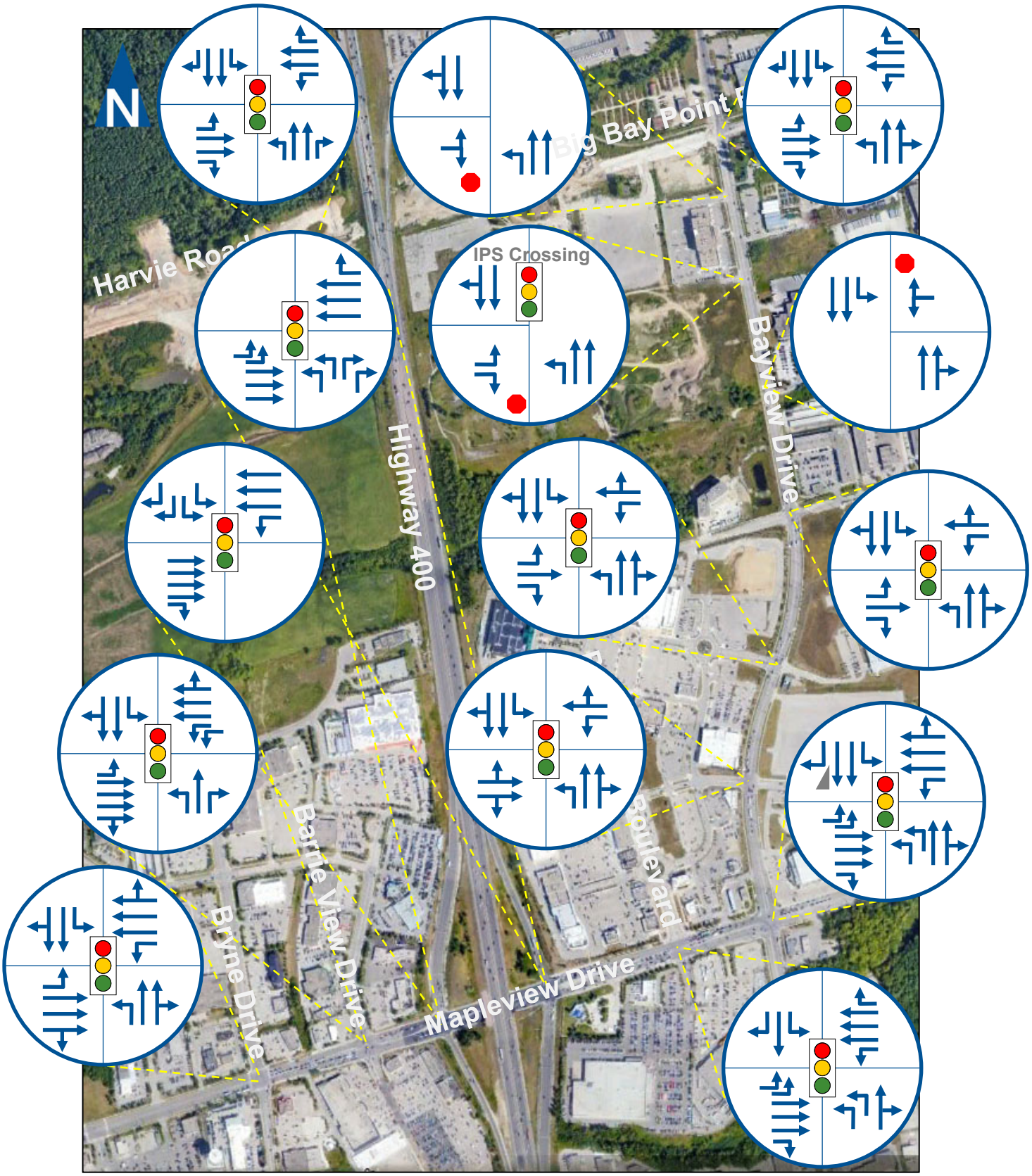
TABLE 3.1: EXISTING ROAD NETWORK CHARACTERISTICS

Road	Jurisdiction	Classification and Cross Section	Max. Speed Limit[1]
Mapleview Drive	City	Urban arterial, 6-lane plus auxiliary turn lanes and sidewalks	60 km/h
Highway 400	MTO	Rural freeway 6-lane with paved shoulders	100 km/h
Bayview Drive	City	Urban major collector, 4-lane plus auxiliary turn lanes and sidewalks	50 km/h
Big Bay Point Road	City	Rural arterial, 2-lane	50 km/h
Churchill Drive	City	Rural minor collector, 2-lane	50 km/h
Park Place Boulevard	Private	Urban local, 4-lane plus auxiliary turn lanes and sidewalks	n/a[2]
South Village Way	Private	Urban local, 2-lane with 4-lanes at Bayview Drive, and sidewalks	
North Village Way	Private		
Concert Way	Private	Urban local, 2-lane with 5-lanes at Bayview Drive, and sidewalks	
Barrie View Drive	City	Urban local, 4-lane plus auxiliary turn lanes and sidewalks	50 km/h
Bryne Drive	City	Urban major collector, 4-lane plus auxiliary turn lanes and sidewalks	50 km/h
Harvie Road	City	Urban arterial, 5-lane	50 km/h

[1]Where the speed limit is not posted; the statutory 50 km/h has been assumed.

[2]Some internal roads at Park Place are posted with 20 km/h speed limit signs

Figure 3.1 illustrates the existing lane arrangements and traffic control devices at the study area intersections. As noted in the Introduction, many study area road network improvements have been made as part of previous approvals for Park Place. These include widening Highway



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Existing Lanes and Traffic Control

Figure 3.1

400 on and off ramps at the Mapleview Drive interchange, and improvements to the Mapleview Drive intersections with Park Place Boulevard (and the Costco access opposite to Park Place Boulevard) and Bayview Drive. Each of the latter intersections have been constructed to essentially a full build-out condition, although not all lanes that have been built are currently in use (e.g., a second southbound left turn lane on the Park Place Boulevard approach to Mapleview Drive, a second southbound left turn lane on the Bayview Drive approach to Mapleview Drive and a second westbound left turn lane on the Mapleview Drive approach to Bayview Drive).

3.2 Transit

The study area is currently served by several Barrie Transit routes. A transit hub is provided on-site within Park Place as well as transit stops located along Bryne Drive, Barrie View Drive, Mapleview Drive, and Bayview Drive.

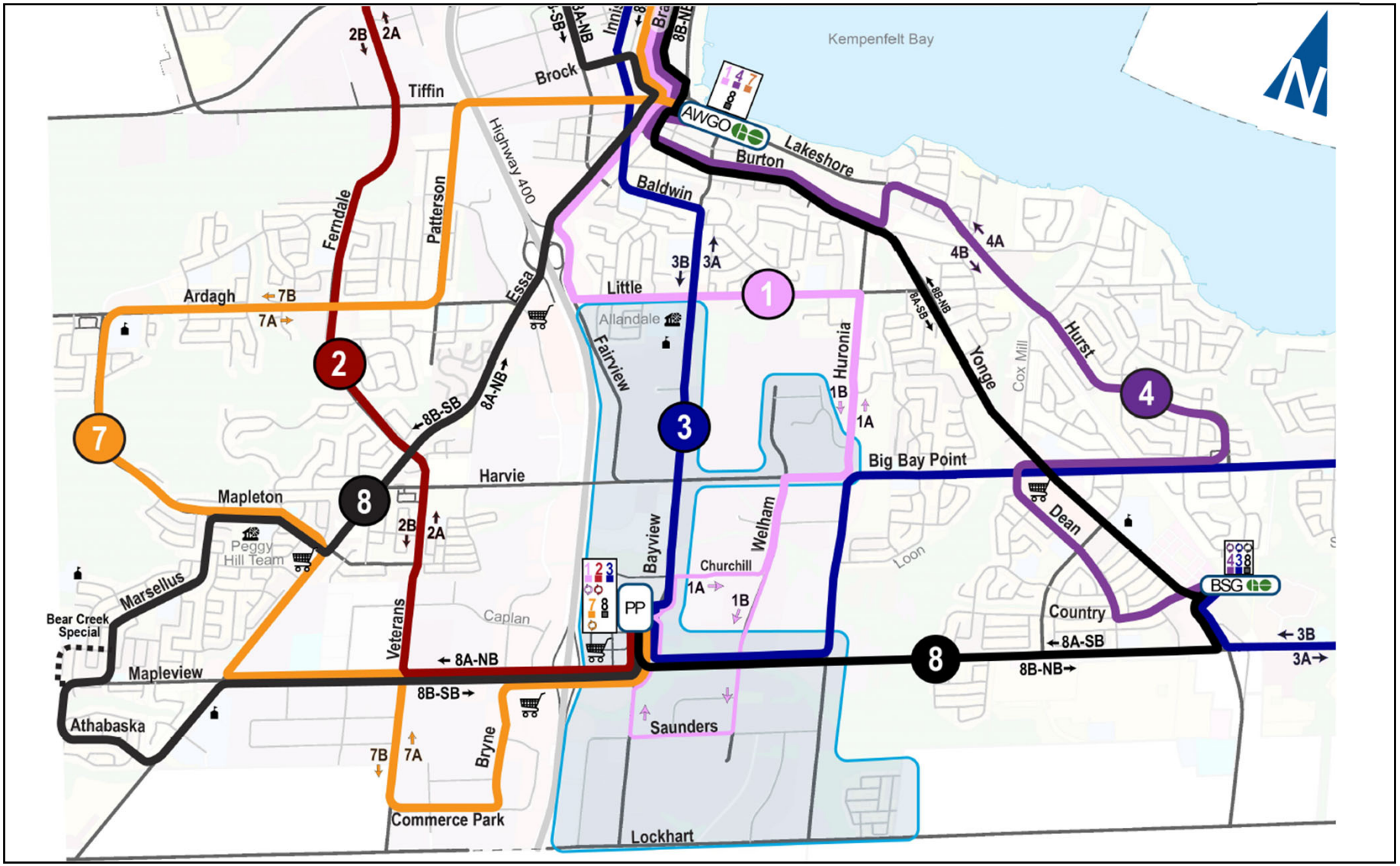
Inter-regional travel is provided by GO Transit services. Two GO Stations currently serve the residents of Barrie – the Allandale Waterfront GO Station and the Barrie South GO Station provide rail service as well as connections to various Barrie Transit routes. When connecting to or from the GO Train, local transit is at no cost. Riders only need to display a valid Barrie Transit ticket or Presto Fare Card and travel within 30-minutes of arrival or departure train times at Allandale Waterfront GO or Barrie South GO stations.

Based on current information posted on the Barrie Transit and GO Transit websites, the study area is served by the following transit routes:

- Barrie Transit:
  - Route 1A – Georgian Mall
  - Route 1B – Welham
  - Route 2A – Dunlop
  - Route 2B – Park Place
  - Route 3A – Bayview
  - Route 3B – Painswick
  - Route 7A – Grove
  - Route 7B – Bear Creek
  - Route 8A – RVH/Yonge
  - Route 8B – Crosstown/Essa

- GO Transit:
  - The Allandale Waterfront GO Station can be accessed via Barrie Transit Routes 1A/B, 7A/B, and 8A/B.
  - The Barrie South GO Station can be accessed via Barrie Transit Routes 3A/B and 8A/B.

Figure 3.2 illustrates the available transit routes in the vicinity of the subject site.



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Transit Routes

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Figure 3.2

4 Forecasts

4.1 Background Traffic

Through the agreed upon Terms of Reference developed for this TIS, both City and MTO staff confirmed the use of previous traffic modeling forecasts for use. These forecasts properly account for the redistribution of trips in the road network, resulting from the recently completed Harvie Road-Big Bay Point Road flyover (operational since June 2021) as well other area-wide transportation improvements.

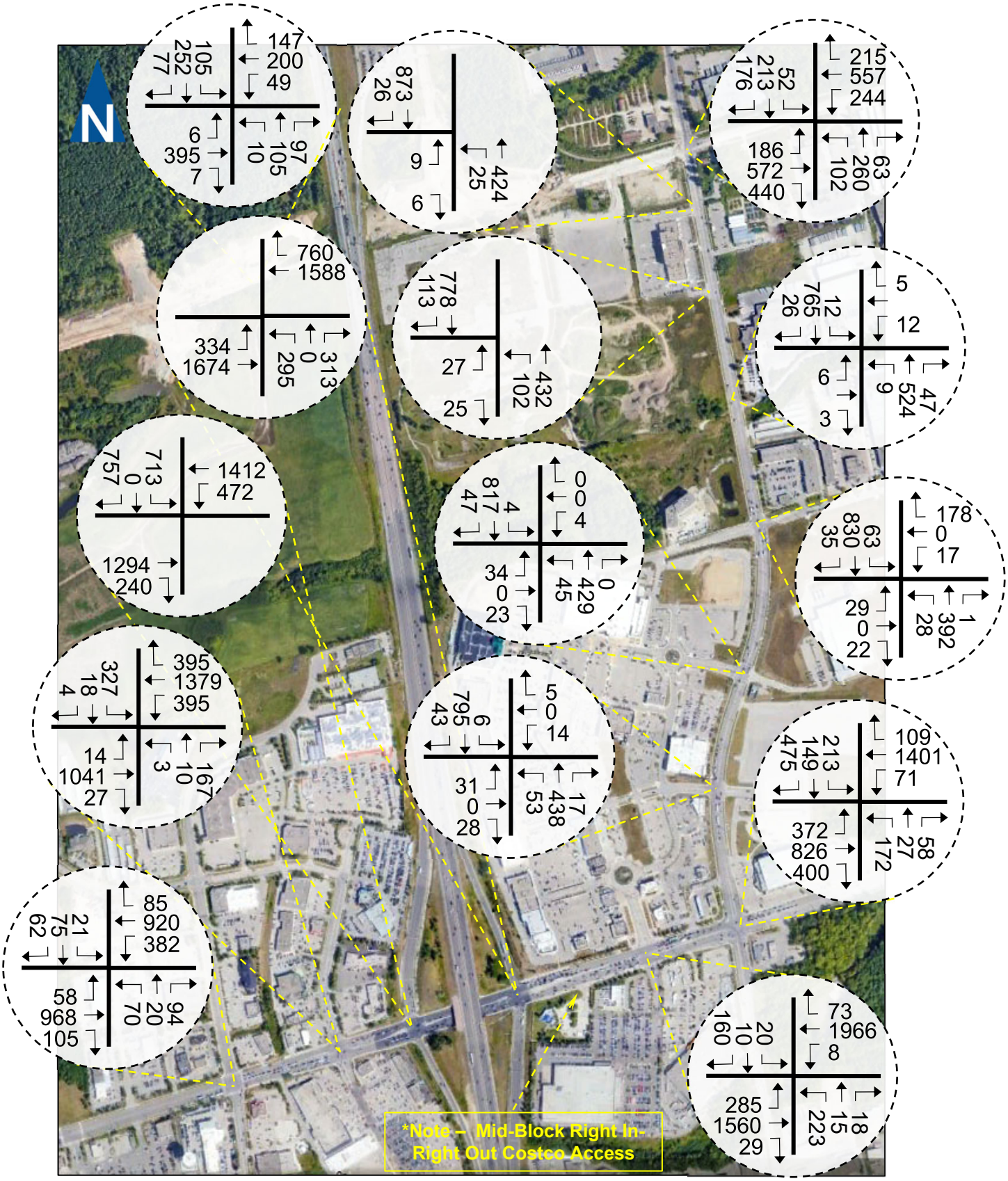
The Park Place Stage 2 TIS (March 2020) provides details of the modeling exercise conducted.

In addition to the background growth contributions and the incremental site traffic for additional development plans to 2031, the review agencies requested the full development of the Park Place North Lands to also be accounted for as part of the traffic forecasts. **Appendix B** contains the site traffic assignments for the proposed industrial development within the Park Place North Lands for reference.

Figure 4.1 and **Figure 4.2** shows the resultant traffic volumes representing background traffic for the 2026 AM and PM peak hours, respectively.

Figure 4.3 and **Figure 4.4** shows the resultant traffic volumes representing background traffic for the 2031 AM and PM peak hours, respectively.

Figure 4.5 and **Figure 4.6** shows the resultant traffic volumes representing background traffic for the 2036 AM and PM peak hours, respectively.



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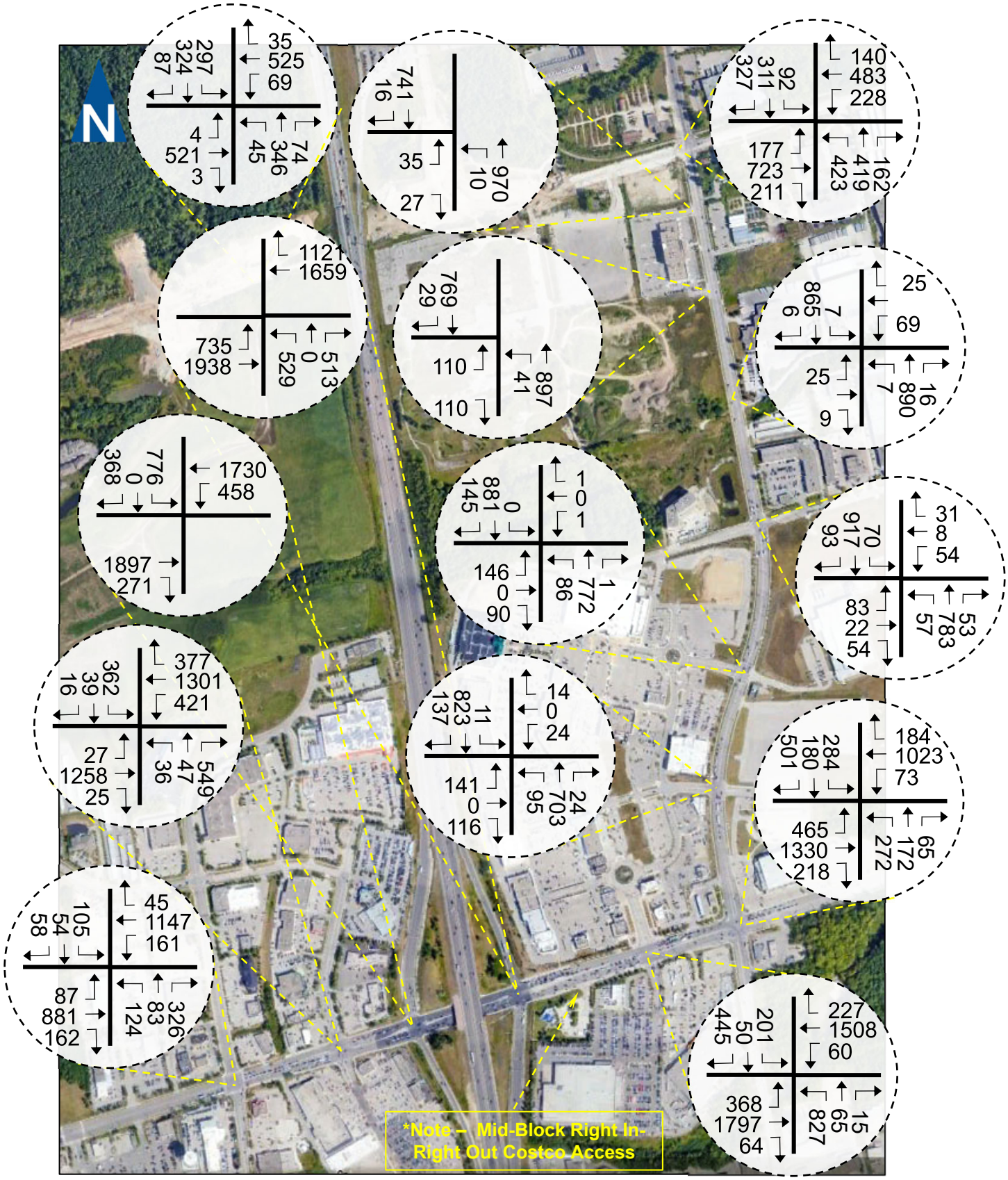
2026 Background Traffic AM Peak Hour

Figure 4.1



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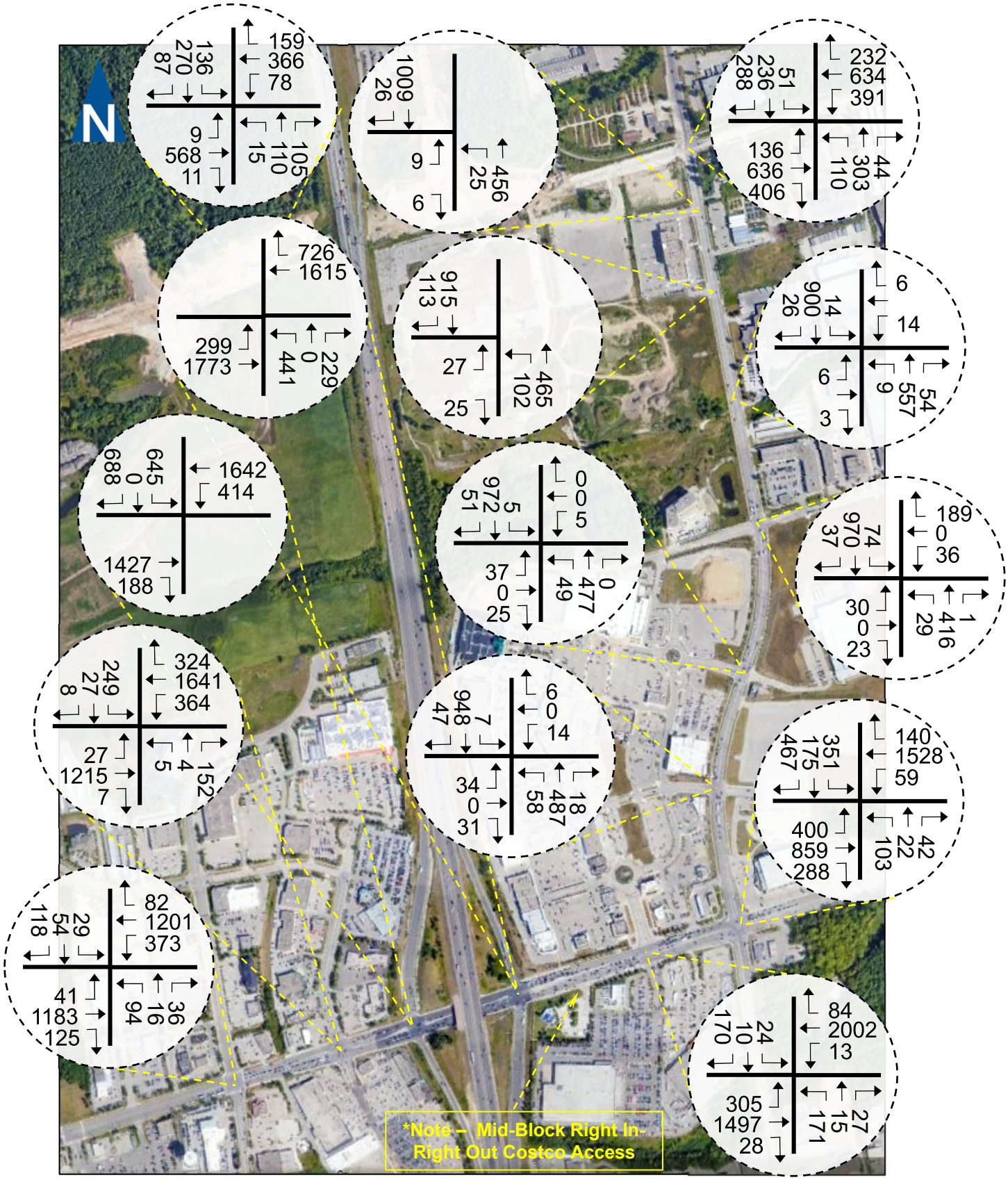
2026 Background Traffic PM Peak Hour

Figure 4.2



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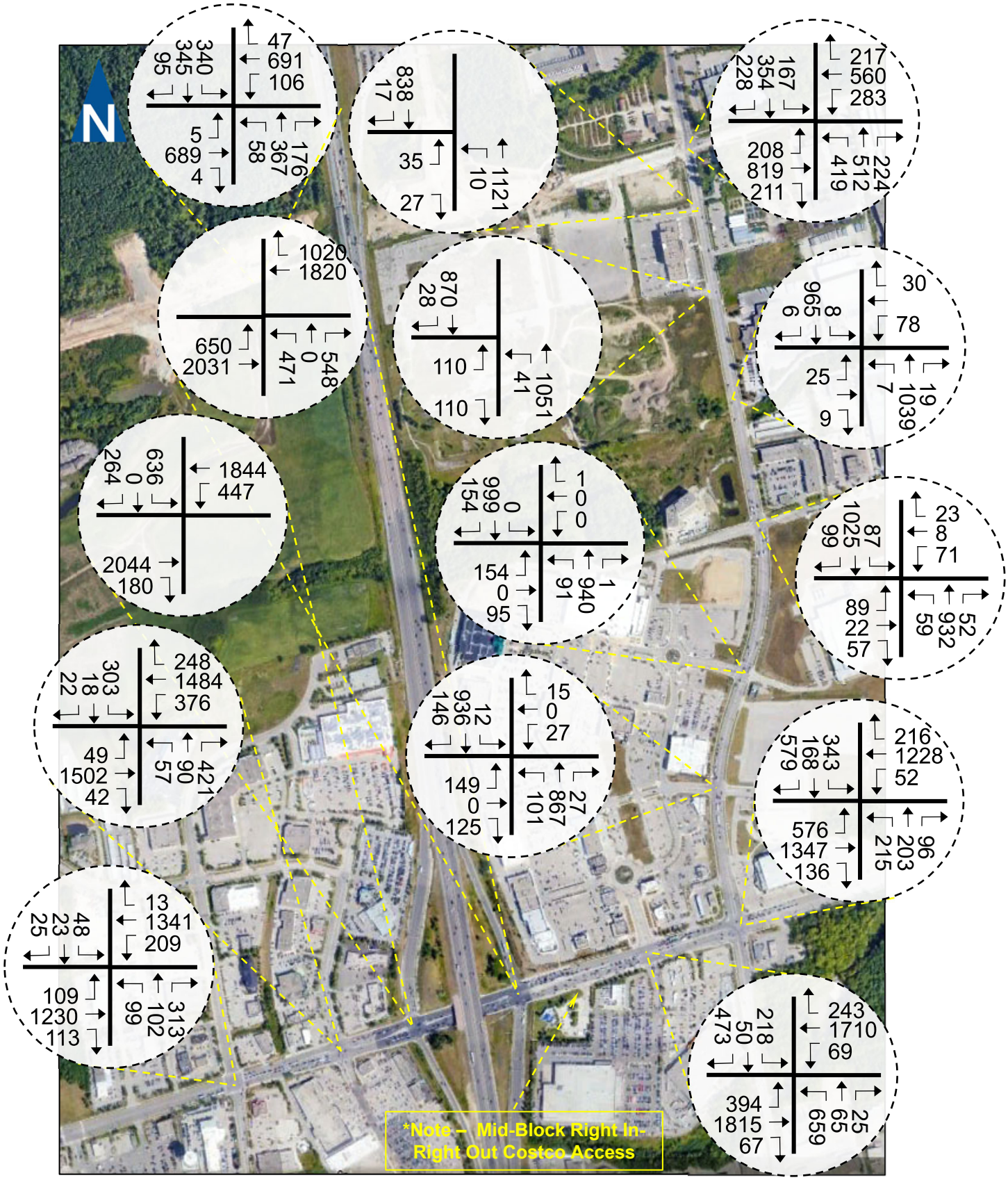
2031 Background Traffic AM Peak Hour

Figure 4.3



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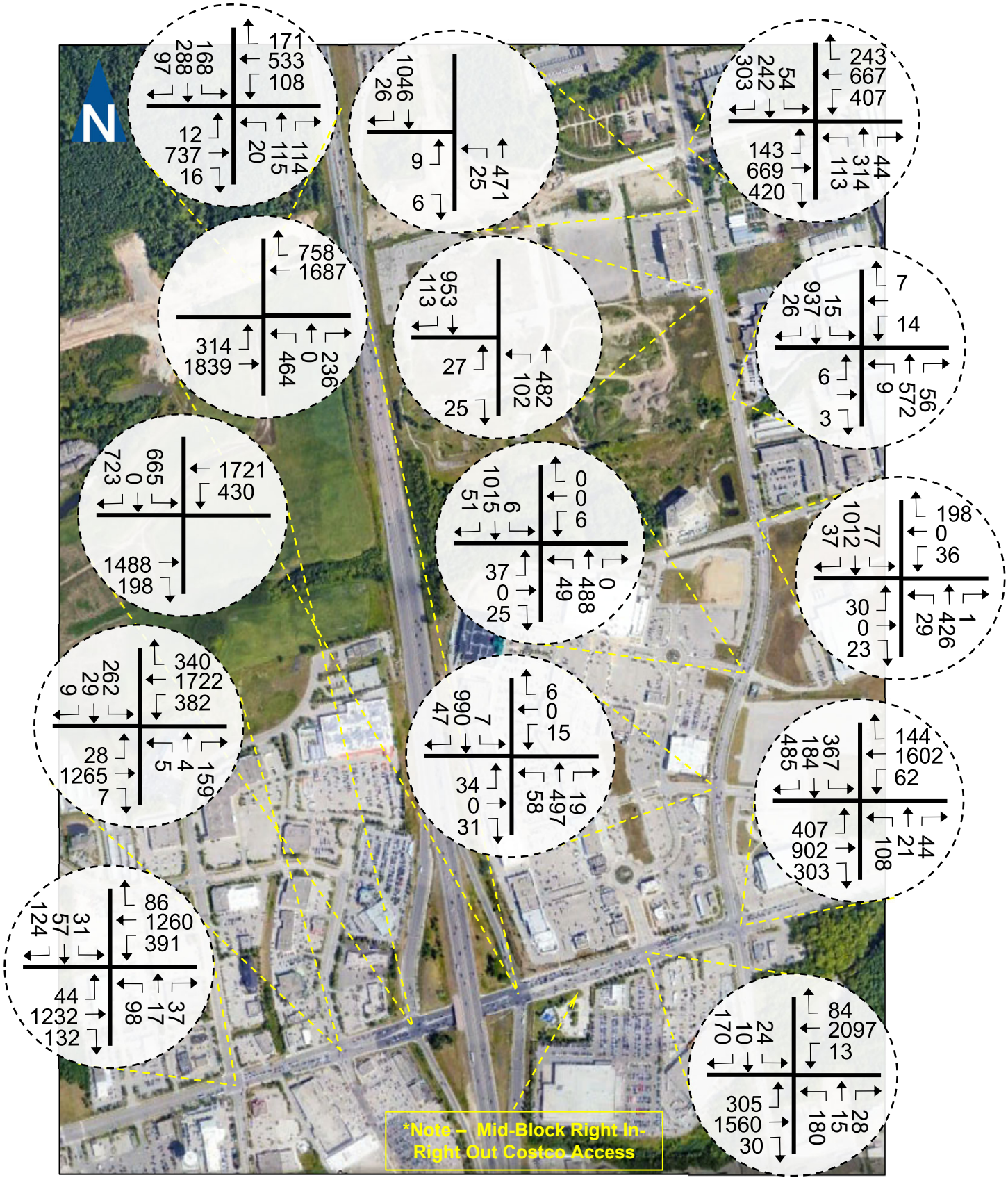
2031 Background Traffic PM Peak Hour

Figure 4.4



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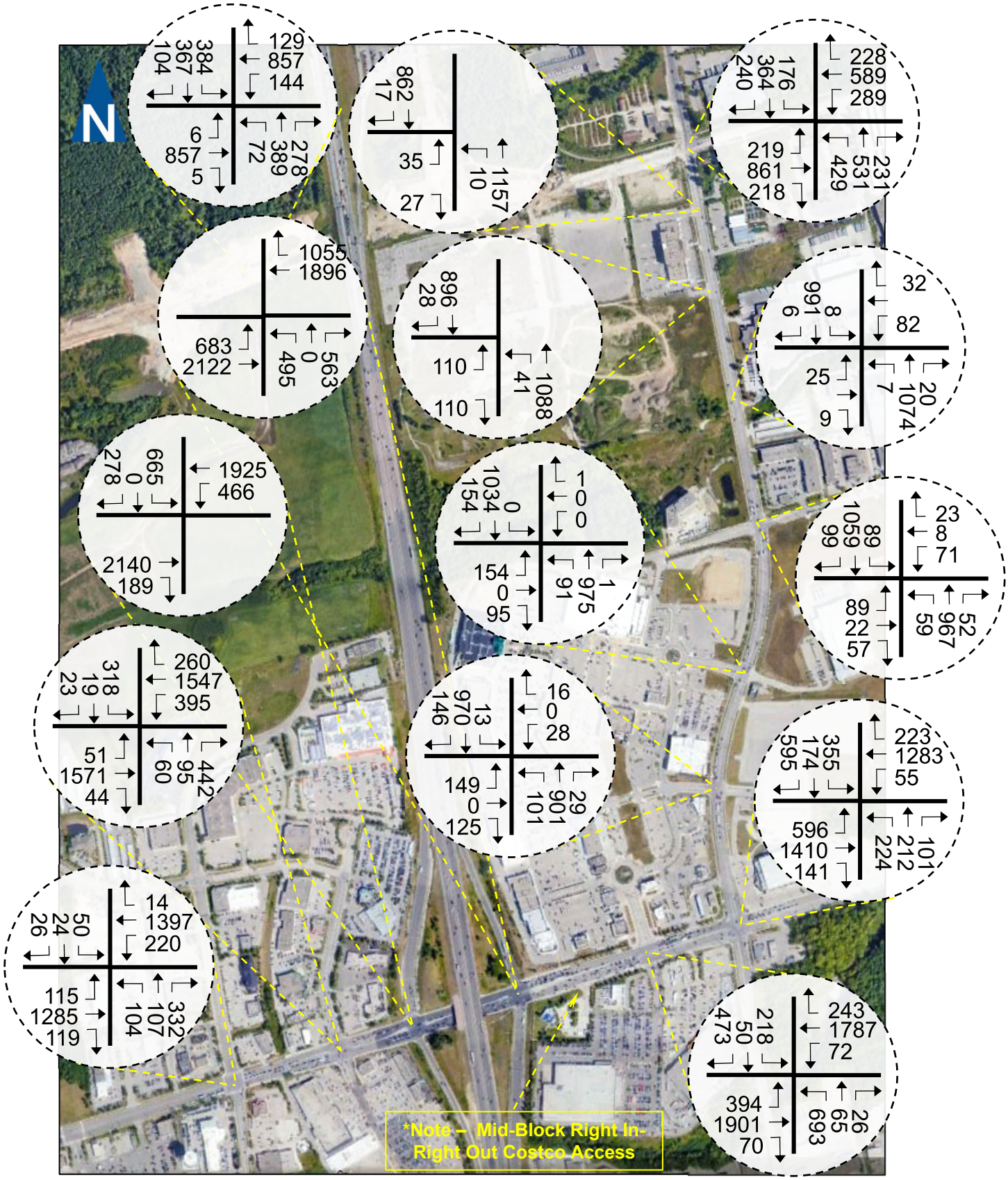
2036 Background Traffic AM Peak Hour

Figure 4.5



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2036 Background Traffic PM Peak Hour

Figure 4.6

4.2 Site Traffic

4.2.1 Trip Generation

The Institute of Transportation Engineers (ITE) Trip Generation Manual (10th Edition) was referenced to estimate the peak hour vehicle traffic volumes that would be generated by the proposed residential development, specifically Land Use Code (LUC) 222 – Multifamily House (High-Rise).

Consistent with the Park Place Stage 2 TIS (March 2020), the developed retail trip rate for the AM peak was utilized, and standard ITE Shopping Centre (LUC 820) rates were applied for the PM peak hour.

To be conservative in the assignment, no reductions were made to trip generation to account for a higher non-auto modal split. Furthermore, for the proposed retail-commercial within the residential buildings, no pass-by trips were accounted for (i.e., errs on the high side).

Table 4.1 summarizes the resultant weekday AM and PM peak hour site trip generation.

A total of 175 and 366 vehicular trips are forecast to be generated and added onto the adjacent transportation network under the AM and PM peak hours, respectively.

In comparison to the original retail proposal (Building 4-2 and Building 3-4), the proposed mixed-use residential development would generate an additional 122 vehicle trips during the AM peak hour, and an additional 62 vehicle trips during the PM peak hour.

TABLE 4.1: RESIDENTIAL SITE TRIP GENERATION

Development	Land Use	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
475 Units	Residential	35	111	146	104	66	170
2,346 SM (25,254 SF) GLA Retail	Retail-Commercial	19	10	29	94	102	196
TOTAL	-	***54***	***121***	***175***	***198***	***168***	***366***

4.2.2 Trip Distribution and Assignment

The trip distribution was based on the distribution patterns employed in the Park Place Stage 2 TIS (March 2020) for consistency. The site-generated trips were assigned to the study area road network and logically routes to/from site accesses based on the gateway origin or destination and considering the distribution of development within the Park Place South Lands.

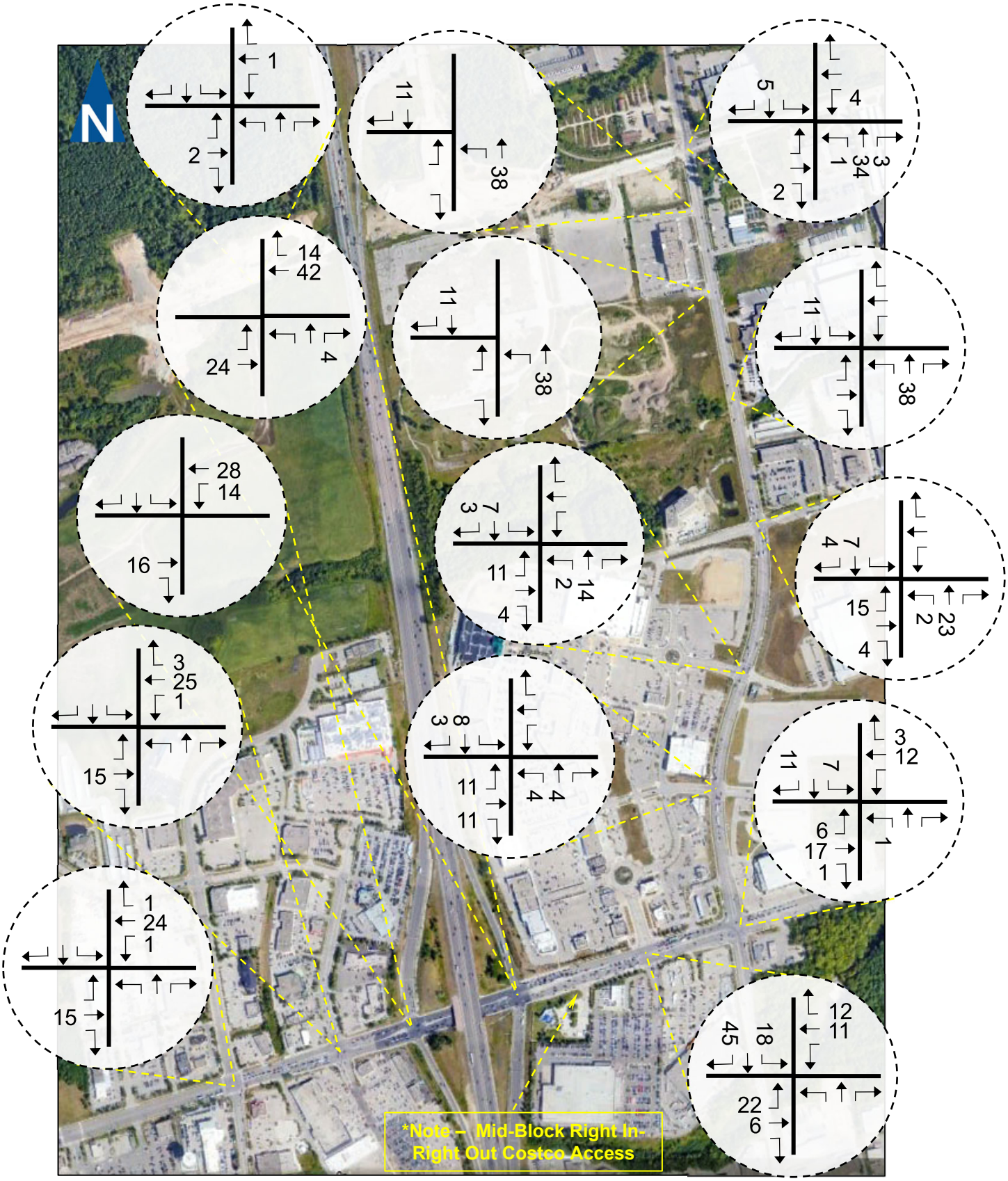
Table 4.2 summarizes the trip distribution applicable for the 2026 build-out year, 2031 and 2036 Horizon Years.

TABLE 4.2: TRIP DISTRIBUTION

To/From	Via	AM		PM	
		In	Out	In	Out
North	Bayview Drive	10%	28%	16%	11%
	Highway 400 (Mapleview Dr.)	16%	12%	4%	14%
South	Highway 400 (Mapleview Dr.)	7%	11%	20%	5%
	Bayview Drive	1%	1%	3%	3%
East	Big Bay Point Road	7%	3%	11%	8%
	Mapleview Drive	27%	20%	21%	24%
West	Harvie Road	3%	1%	5%	8%
	Mapleview Drive	29%	23%	20%	25%
TOTAL[1]		***100%***	***100%***	***100%***	***100%***

[1]Any errors in total percentage are due to rounding.

Figure 4.7 and **Figure 4.8** illustrate the respective AM and PM peak hour site traffic for the residential development.



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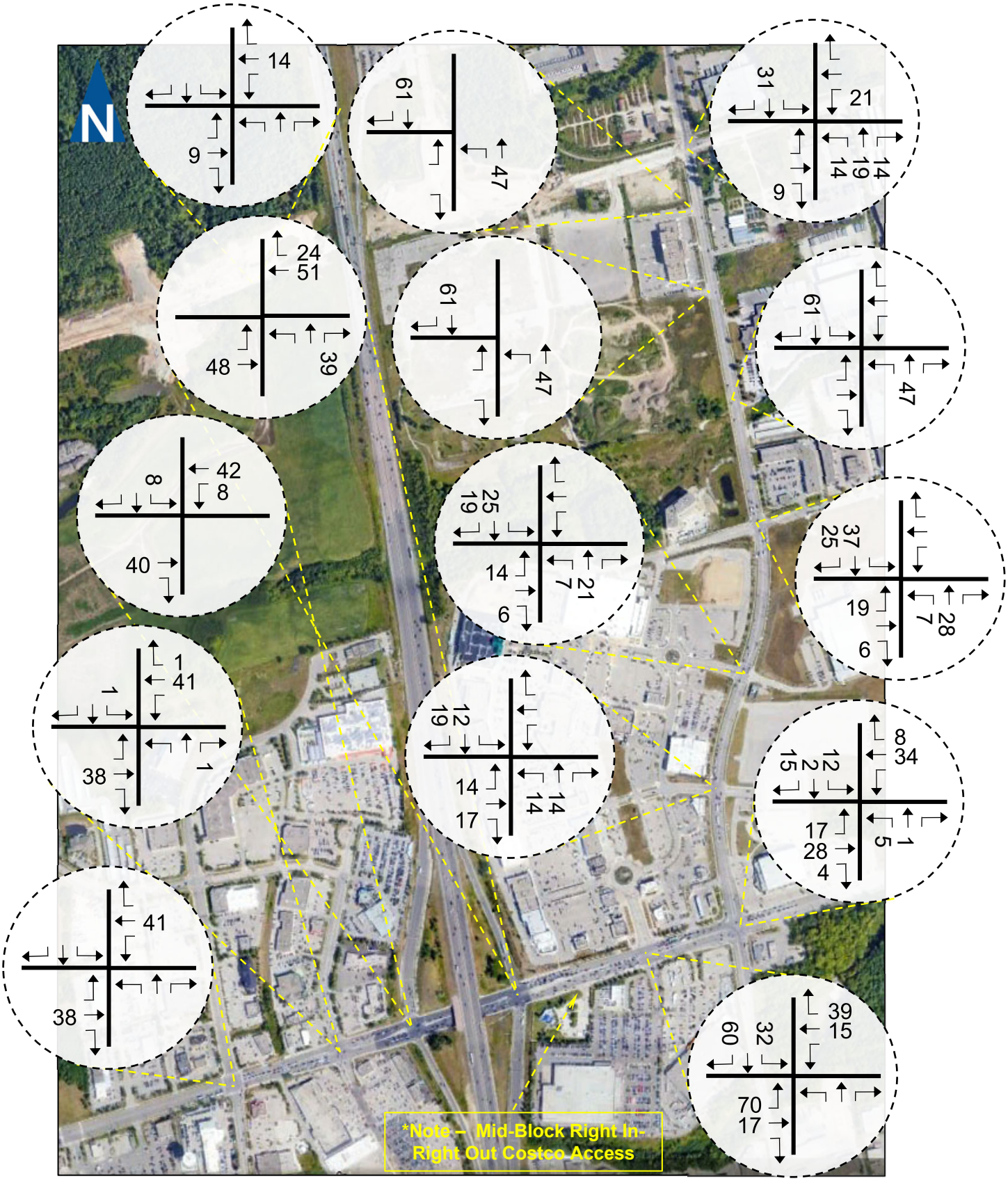
Site Traffic
AM Peak Hour

Figure 4.7



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Site Traffic
PM Peak Hour

Figure 4.8

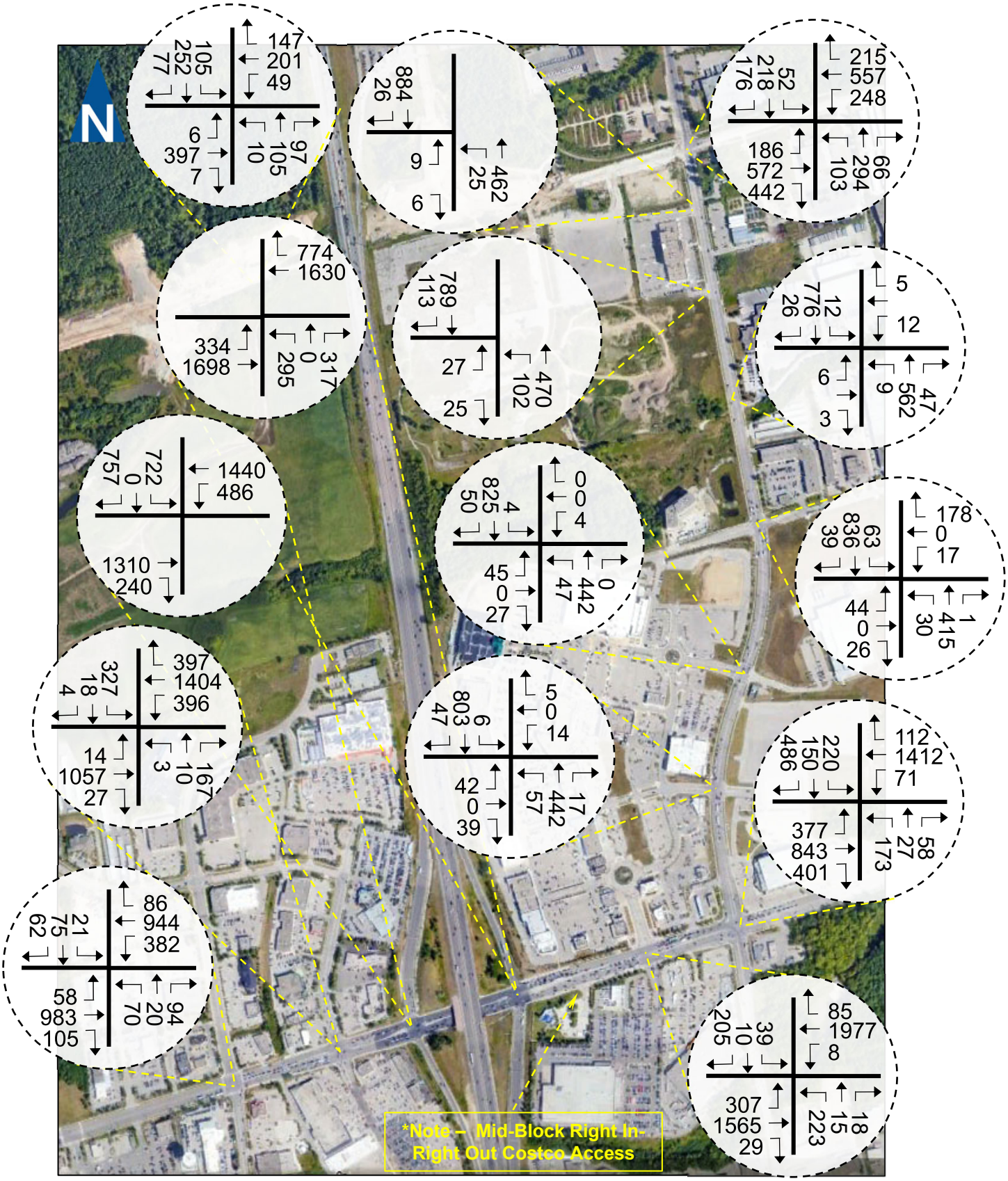
4.3 Total Traffic

The background traffic trips were combined with the site traffic trips to form the total traffic forecasts for each horizon year.

Figure 4.9 and **Figure 4.10** show the resultant traffic volumes representing total traffic for the 2026 AM and PM peak hours, respectively.

Figure 4.11 and **Figure 4.12** show the resultant traffic volumes representing total traffic for the 2031 AM and PM peak hours, respectively.

Figure 4.13 and **Figure 4.14** show the resultant traffic volumes representing total traffic for the 2036 AM and PM peak hours, respectively.



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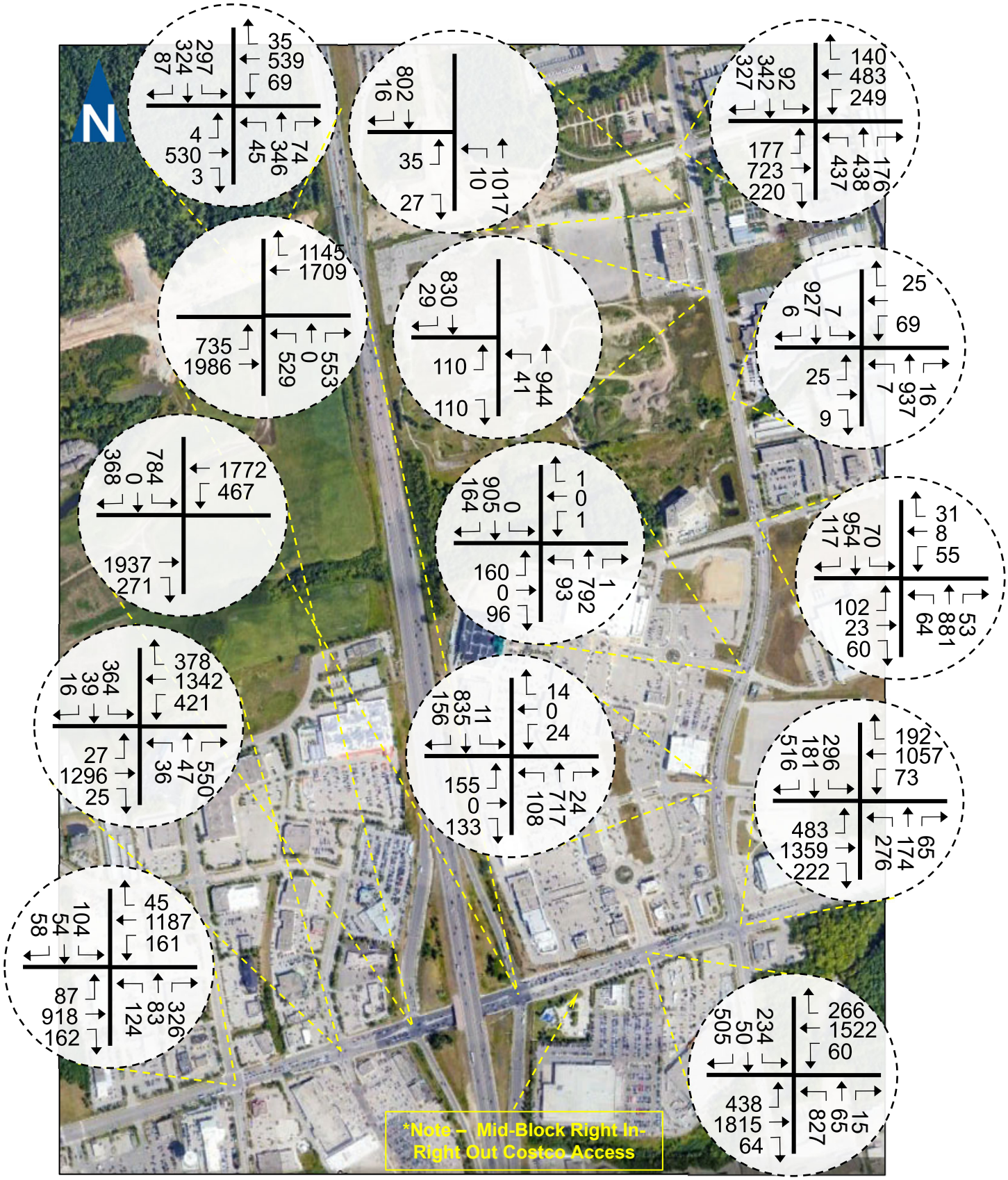
2026 Total Traffic AM Peak Hour

Figure 4.9



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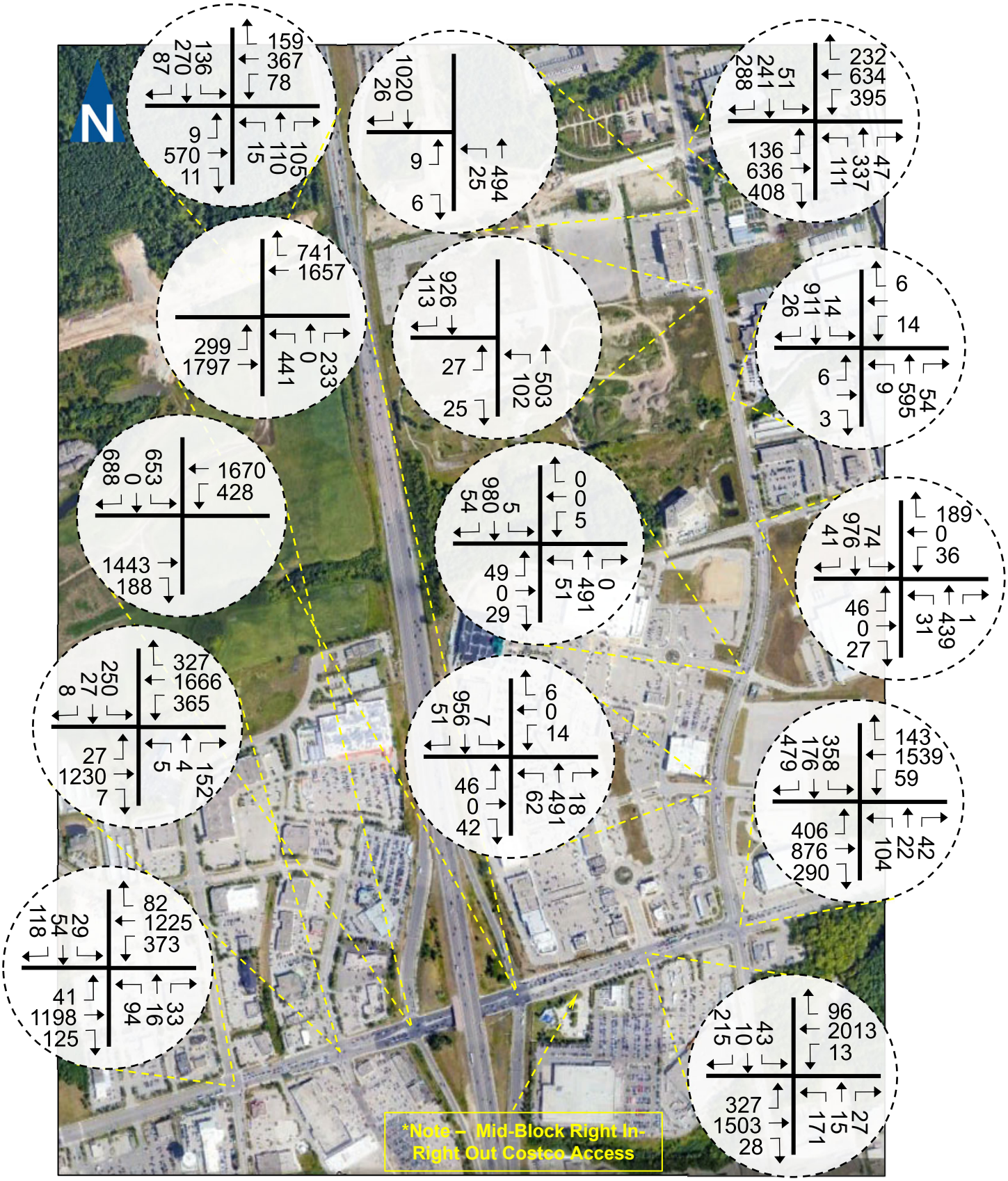
2026 Total Traffic PM Peak Hour

Figure 4.10



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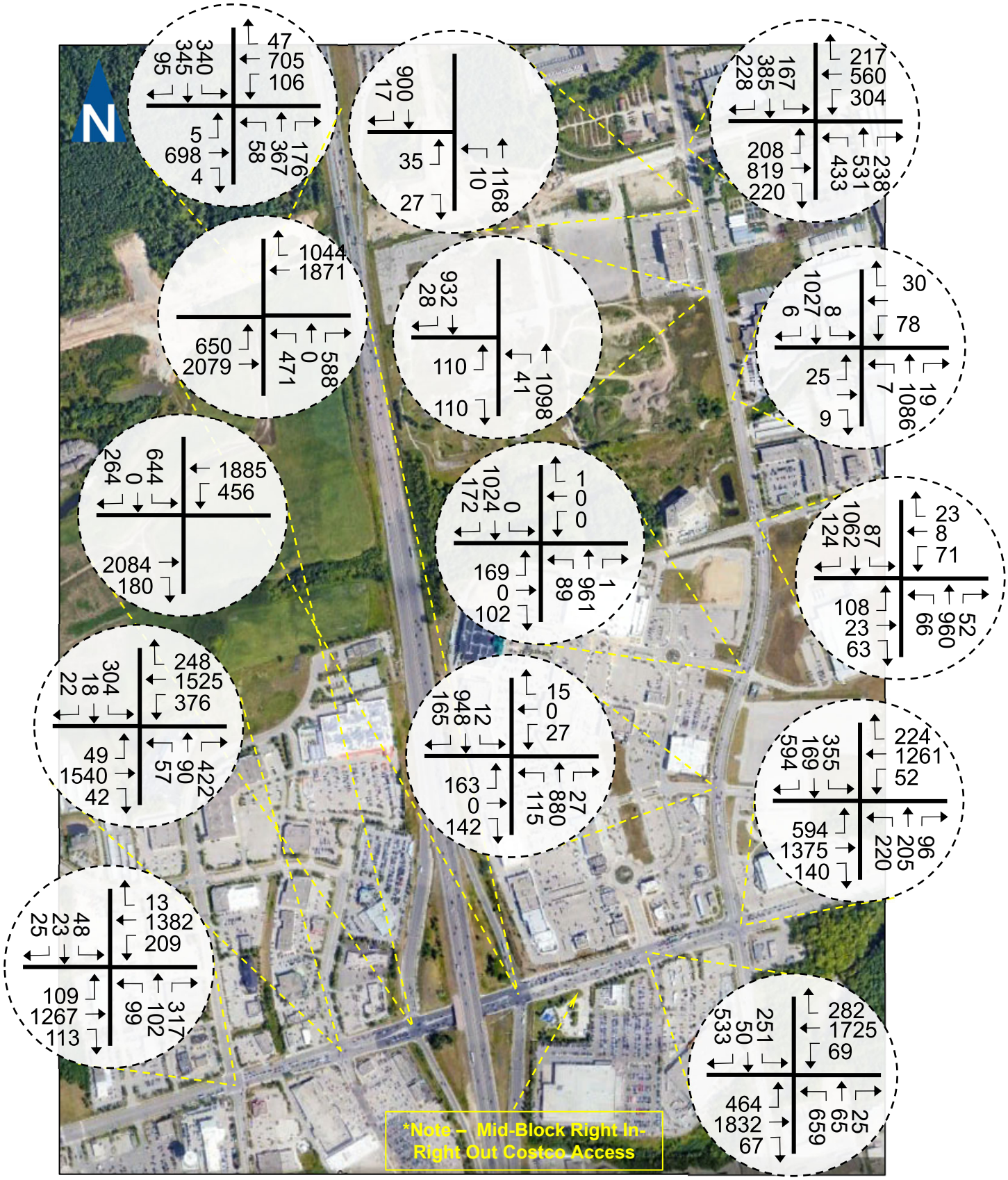
2031 Total Traffic AM Peak Hour

Figure 4.11



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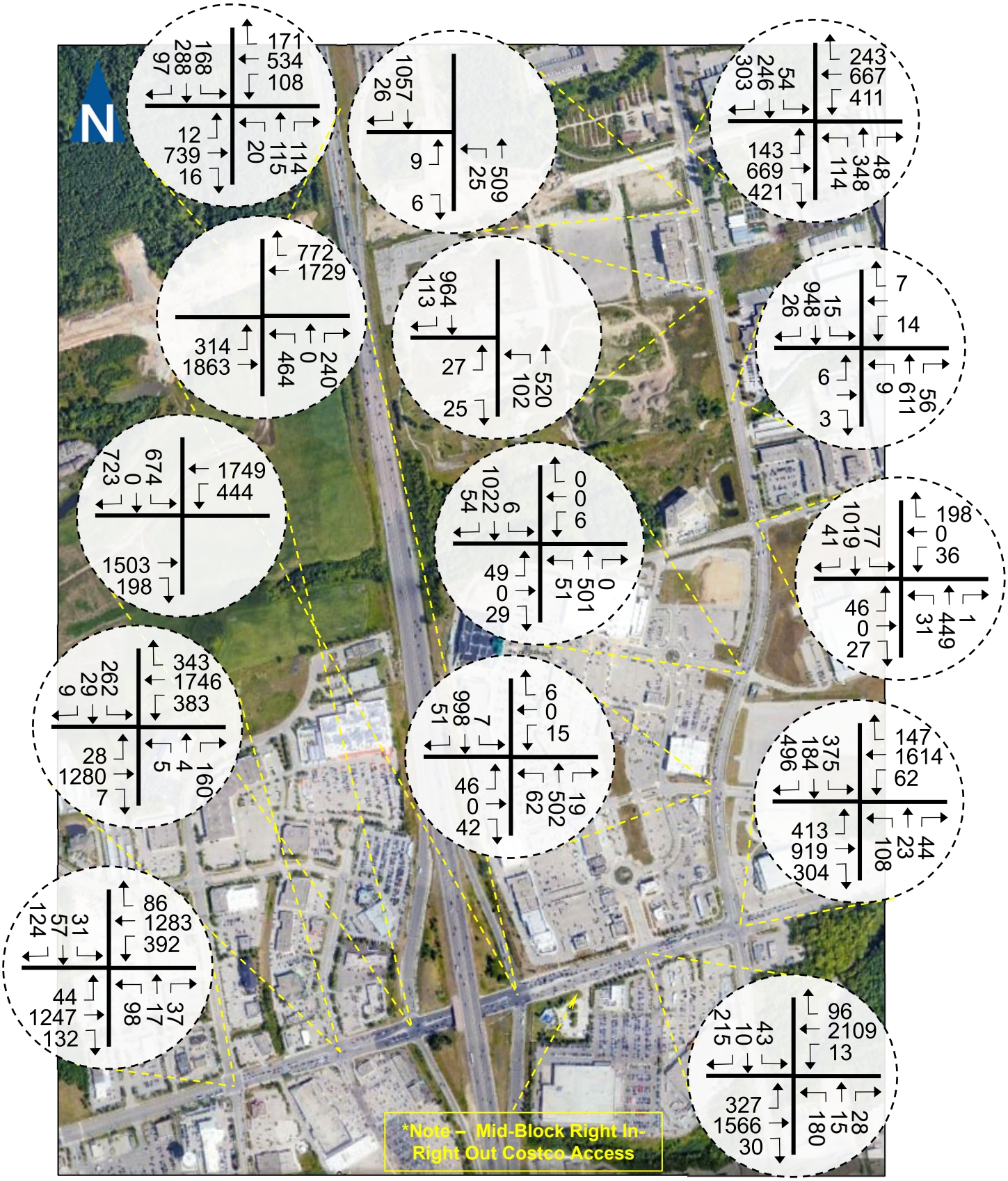
2031 Total Traffic PM Peak Hour

Figure 4.12



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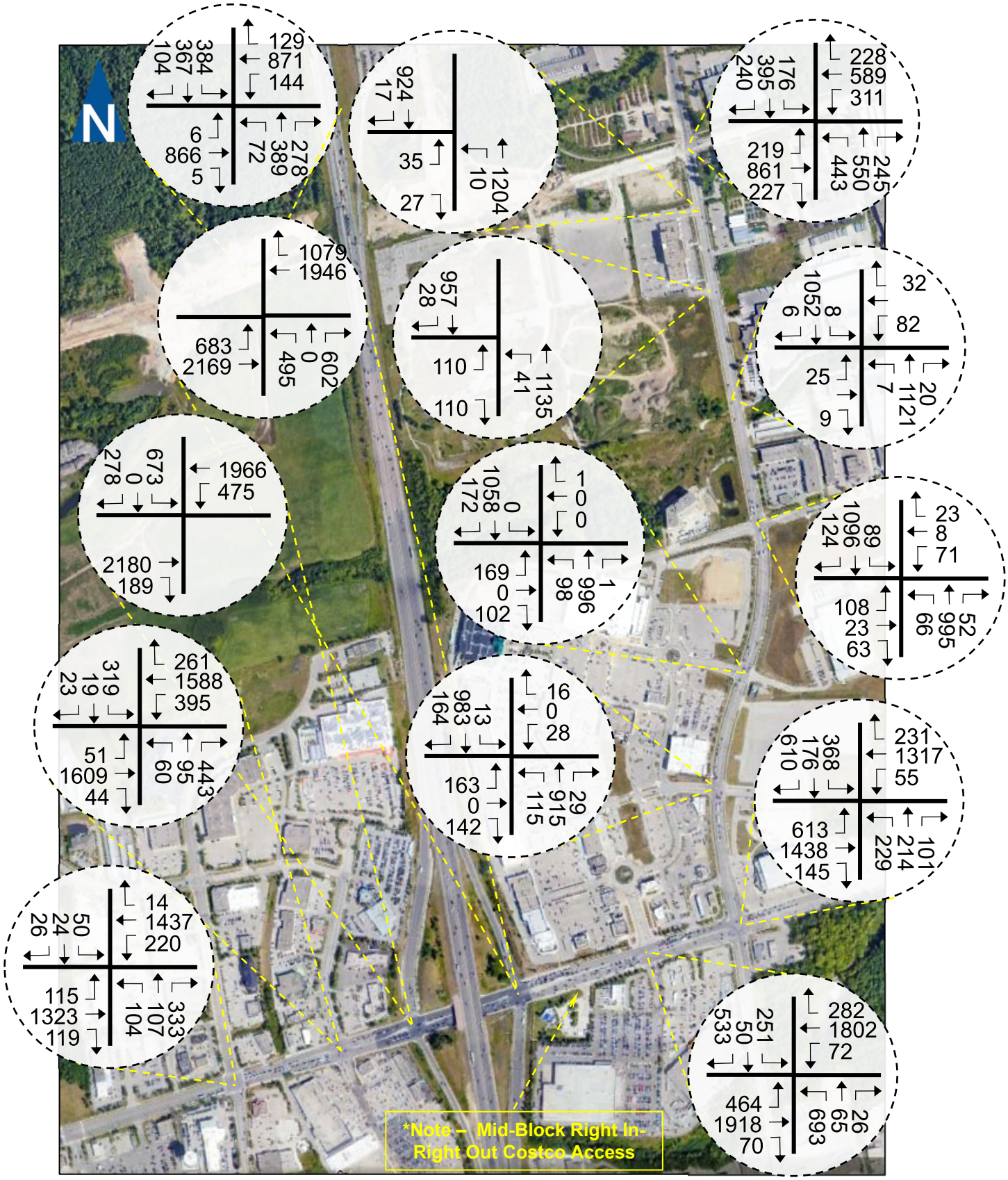
2036 Total Traffic AM Peak Hour

Figure 4.13



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2036 Total Traffic PM Peak Hour

Figure 4.14

5 Future Traffic Operations

Intersection level of service (LOS) is a recognized method of quantifying the average delay experienced by drivers at intersections. It is based on the delay related to the number of vehicles desiring to make a through or turning movement, compared to the estimated capacity for that movement. The capacity is based on several criteria including, but not limited to, vehicle headways, intersection geometry, vehicle composition, opposing traffic flows, and for signalized intersection, signal timing. Capacity is evaluated in terms of the ratio of demand flow to capacity with an at-capacity condition represented by a volume-to-capacity (V/C) ratio of 1.00 (i.e. volume demands equals capacity).

The highest possible rating is LOS A, in which the average total delay is equal or less than 10.0 seconds per vehicles. When the average delay exceeds 80 seconds for signalized intersections, 50 seconds for unsignalized intersections or when the volume-to-capacity ratio is greater than 1.00, the movement is classed as LOS F and improvements are usually implemented, if they are feasible. LOS E is generally used as a guideline for the determination of road improvement needs on through lanes, while LOS F may be acceptable for left-turn movements at peak times, depending on capacity and safety considerations. It is also recognized that the guidelines for determining when improvements are necessary can vary in different municipalities.

For this study, the criteria in the MTO Traffic Impact Study Guideline have been considered in determining the potential need for possible capacity or traffic control improvements at signalized intersections. The criteria for what are typically referred to as *"critical movements"* include:

- Where v/c ratios for traffic movements are greater than 0.85; and
- The MTO guideline also includes a specific reference to "terminal ramp approaches" being considered for possible operational improvements if the v/c ratio is greater than 0.75.

The 95th and 50th percentile queue lengths have also been reviewed for comparison with available storage to determine where possible increases in storage length could be considered.

For unsignalized intersections, the following typical criteria have been used for assessing the operations of the movements that experience delay (i.e. movements that must wait for a gap in opposing traffic):

- Level of service for individual movements that exceed LOS E (based on average delay per vehicle); and
- 95th percentile queue lengths for individual movements that exceed the available storage lane length.

To assess the existing peak hour traffic operating conditions, the level of service analysis has been conducted using Synchro software, which implements the methods of the Highway Capacity Manual (HCM). Queue lengths have been determined by running the SimTraffic module of Synchro, which included a 15 minute seeding interval, a 60 minute analysis period, and averaging the queue results for five runs of the model.

The following parameters have been utilized in the operational analysis:

- Existing and anticipated future lane configurations, where applicable;
- Heavy vehicle percentages in existing traffic counts;
- Conflicting pedestrian volumes in existing traffic counts;
- Optimized signal timing within the phasing, cycle lengths, and offsets provided by City staff;
- Calculated intersection peak hour factors (PHF) for the AM and PM peak hours. The use of the PHF results in an analysis of the peak 15-minute period flow during each peak hour; and
- Synchro default values for all other inputs.

5.1 2026 Horizon

5.1.1 Methodology

The 2026 traffic forecasts were analyzed using the methodology noted under Section 5. The existing intersection lane configurations were used for an initial analysis with the exception of the Harvie Road/Bryne Drive intersection reflecting its recent improvement.

It is assumed the Bryne Drive extension between Caplan Avenue and Harvie Road would be completed by 2026 based upon the City of Barrie Staff Report INF007-21 (October 18, 2021). With the completion of the extension an intersection would be formed with Harvie Road. Based on the "*Harvie Road, Essa Road, and Bryne Drive Class EA (Phases 3 and 4) (2017)*" – Appendix G Preferred Design Concepts, each intersection approach would have two through lanes, left turn lanes and right turn lanes.

The Mapleview Drive/Highway 400 ramp terminals have been analyzed under the existing Diamond Interchange configuration. It is not realistic to assume that the DDI configuration would be in place within the next four years.

5.1.2 Capacity Analysis – 2026 Background

Table 5.1 represents the results of the analysis of AM and PM peak hour background traffic operations (without proposed development). V/C ratios greater than the MTO criteria are highlighted. **Appendix C** contains the Synchro analysis reports.

The analysis indicates that the Mapleview Drive intersections with the Highway 400 ramp terminals operate at or are approaching capacity with several individual movements above the MTO v/c critical thresholds in both peak hours. As well, the overall PM peak hour volume demands at the Mapleview Drive intersection with Park Place Boulevard-Costco Access slightly exceed the theoretical capacity. The latter conditions are largely influenced by the operation of the eastbound dual left turn movement for traffic entering Park Place and the southbound right turn movement for traffic exiting from Park Place. The other study area intersections along Mapleview Drive, operate within capacity and with a small number of movements with v/c ratios higher than the 0.85 criteria. The Bayview Drive study area intersections operate well within capacity and at good levels of service and few have v/c ratios higher than the stated criteria.

Regarding the Mapleview Drive/Park Place Boulevard intersection, several alternatives were discussed with City staff in the past to attempt to improve current operations. Subsequently, these were explored further at the request of the applicant representatives. **Appendix D** contains a letter report that presents the analysis of several operational scenarios that include either modifying signal phasing by adding a southbound right turn overlap phase (provides a green arrow for the southbound right turn during the non-conflicting eastbound/westbound advanced left turn phases) or changing the single southbound right turn lane operation to dual southbound right turns. It was determined that the overlap phase with the existing single right turn lane would provide a significant improvement with little impact on other aspects of the intersection operations. Similarly, dual southbound right turn lanes would provide some improvement but could also contribute to weaving problems for westbound traffic west of this intersection as some motorists using the dual right turn lanes will be changing lanes to access Highway 400 northbound or southbound on-ramps or to continue westbound on Mapleview Drive. Consequently, the provision of a southbound right turn overlap phase

is the only improvement alternative considered later in the report for the analysis of subsequent future horizon year traffic conditions.

The Mapleview Drive intersections with the Highway 400 Northbound Off/On Ramps and Park Place Boulevard Intersections reports several volume demands for certain movements exceeding the theoretical capacity. Where the more significant capacity deficiencies are evident, possible improvements have been considered and the results with mitigation measures in place are shown in the next row of the table.

Mitigation measures have been considered at the following intersections:

Mapleview Drive/Highway 400 Northbound Off/On Ramps

- The initial analysis showed that this intersection would be over capacity (v/c of 1.03) primarily due to high v/c ratios for the eastbound left turn and westbound right turn movements) and two other movements would have v/c ratios above the 0.85 or 0.75 criteria in the PM peak hour;
- The key problem movement is the westbound right turn from Mapleview Drive to Highway 400 northbound, which is currently provided for by a standard right turn lane. The background traffic forecasts show a substantial increase in this volume;
- The mitigation considered is to implement a channelized right turn design so that this movement could operate as free flow for the majority of each signal cycle and under yield control during the eastbound left turn advance phase. The northbound on ramp currently provides two lanes, which facilitates the proposed operation except during the eastbound dual left turn phase. From an examination of aerial photography, there is no physical impediment to making this improvement although a drainage ditch will have to be crossed. It should be noted that the implementation of this type of improvement would likely represent a throw-away cost related to the future implementation of the MTO-recommended DDI design;
- The improvement results in the intersection operating within capacity and at a good level of service (C); and
- As we understand City staff intend to carry out a “Multi-Modal Level of Service/Traffic Study” for the Mapleview Drive corridor. This will provide a focused opportunity to assess additional alternatives for shorter term operational and design solutions for the Mapleview Drive/Highway 400 Northbound Off/On Ramps intersection and to consider ways to avoid throw-away costs in light of the longer term solution of the MTO-recommended DDI.

Mapleview Drive/Park Place Boulevard-Costco Access

- The initial analysis showed that this intersection would be exceeding the theoretical capacity (v/c of 1.06) and several movements would have v/c ratios exceeding capacity during the PM peak hour;
- The key problem movement is the southbound right turn from Park Place Boulevard to Mapleview Drive (v/c of 1.18). This movement currently operates during a southbound only green signal phase and with right turns on red as permitted during the Mapleview Drive east-west green phase;
- The mitigation considered is to implement a right turn overlap phase that would run concurrently with the non-conflicting eastbound and westbound advanced left turn phases. The southbound green arrow indication for this movement would provide for more effective and efficient right turn movements, and higher capacity, compared to the current right-on-red movement that legally requires stopping before proceeding;
- The improvement results in the intersection operating slightly better (v/c of 0.95) and with less delay (47 seconds versus 70 seconds), and with the southbound right turn movement operating within capacity (v/c of 0.97); and
- As we understand City staff intend to carry out a “Multi-Modal Level of Service/Traffic Study” for the Mapleview Drive corridor. Again, this will allow additional improvement alternatives to be examined for this intersection that would assist in addressing shorter term operational concerns while complementing other proposed improvements to the east and west of this intersection.

The Bayview Drive corridor study area intersections operate well within capacity and at good levels of service.

The future Bryne Drive/Harvie Road intersection is forecast to operate well within capacity and at a good level of service under both the AM and PM peak hours.

TABLE 5.1: OPERATIONAL ANALYSIS – 2026 BACKGROUND

Intersection	Approach/Movement		AM Peak Hour			PM Peak Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
Mapleview Dr./ Bryne Dr. *Signalized*	EB	Left	B	15	0.18	A	8	0.25
		Dual Thru-Thru/Right	C	23	0.50	B	12	0.33
	WB	Left	D	46	0.71	A	7	0.40
		Dual Thru-Thru/Right	A	4	0.34	A	1	0.37
	NB	Left	D	39	0.32	D	53	0.56
		Thru-Thru/Right	D	42	0.08	E	57	0.40
	SB	Left	D	42	0.13	E	57	0.63
		Thru-Thru/Right	D	45	0.23	E	55	0.21
	Overall Intersection		***C***	***22***	***0.67***	***B***	***18***	***0.44***
Mapleview Dr./ Barrie View Dr. *Signalized*	EB	Left	A	9	0.12	C	25	0.25
		Triple Thru-Thru/Right	A	10	0.45	C	30	0.58
	WB	Dual Left	E	57	0.71	E	66	0.81
		Dual Thru-Thru/Right	A	9	0.68	B	17	0.72
	NB	Left	D	44	0.02	D	37	0.10
		Thru	D	46	0.06	D	40	0.11
		Right	D	46	0.11	E	64	0.84
	SB	Left	D	42	0.77	D	36	0.69
		Thru-Thru/Right	C	31	0.02	C	30	0.04
	Overall Intersection		***B***	***19***	***0.76***	***C***	***33***	***0.79***
Mapleview Dr./ HWY 400 SB Off/On Ramp *Signalized*	EB	Quad Thru	C	29	0.71	C	29	0.80
		Right	B	16	0.25	B	15	0.32
	WB	Left	D	45	0.96	D	46	0.94
		Triple Thru	A	10	0.48	A	9	0.52
	SB	Dual Left	D	37	0.72	E	59	0.90
		Dual Right	D	47	0.87	D	41	0.46
	Overall Intersection		***C***	***28***	***0.96***	***C***	***29***	***0.95***
Mapleview Dr./ HWY 400 NB Off/On Ramp *Signalized*	EB	Dual Left	D	38	0.69	E	57	0.98
		Triple Thru	A	4	0.46	B	12	0.55
	WB	Triple Thru	A	5	0.60	C	24	0.71
		Right	D	41	0.55	F	96	1.13
	NB	Dual Left	D	45	0.58	D	54	0.77
		Dual Right	D	47	0.63	E	63	0.86
	Overall Intersection		***B***	***17***	***0.62***	***D***	***42***	***1.03***

Intersection	Approach/Movement		AM Peak Hour			PM Peak Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
Mapleview Dr./ HWY 400 NB Off/On Ramp *Mitigation* *Signalized*	EB	Dual Left	D	38	0.69	D	37	0.88
		Triple Thru	A	4	0.46	A	6	0.55
	WB	Triple Thru	A	6	0.60	C	26	0.76
		Right (Channel/Yield)	A	1	0.52	A	1	0.71
	NB	Dual Left	D	45	0.58	D	53	0.76
		Dual Right	D	47	0.63	E	61	0.85
	Overall Intersection		***B***	***11***	***0.63***	***C***	***22***	***0.83***
Mapleview Dr./ Park Place Blvd. *Signalized*	EB	Dual Left	E	62	0.51	F	138	1.09
		Triple Thru	A	5	0.56	E	57	1.05
		Right	A	9	0.02	A	7	0.04
	WB	Left	B	11	0.05	C	35	0.43
		Triple Thru	C	21	0.92	E	62	1.02
		Right	A	2	0.05	C	24	0.24
	NB	Dual Left	D	48	0.56	E	60	0.91
		Thru/Right	D	44	0.07	D	37	0.16
	SB	Left	D	48	0.15	D	54	0.64
		Thru	D	47	0.07	D	45	0.15
		Right	D	48	0.10	F	166	1.18
	Overall Intersection		***C***	***20***	***0.71***	***E***	***70***	***1.06***
Mapleview Dr./ Park Place Blvd. *Mitigation* *Signalized*	EB	Dual Left	E	58	0.51	E	67	0.85
		Triple Thru	A	4	0.51	C	30	0.89
		Right	A	8	0.02	B	17	0.04
	WB	Left	A	10	0.05	C	33	0.43
		Triple Thru	B	15	0.86	D	41	0.92
		Right	A	2	0.05	B	20	0.21
	NB	Dual Left	D	48	0.56	E	68	0.95
		Thru/Right	D	44	0.07	D	38	0.16
	SB	Left	D	53	0.28	F	88	0.89
		Thru	D	52	0.13	D	51	0.21
		Right (Overlap)	D	35	0.10	F	83	0.97
	Overall Intersection		***B***	***17***	***0.71***	***D***	***47***	***0.95***
Mapleview Dr./ Bayview Dr. *Signalized*	EB	Dual Left	E	67	0.80	E	73	0.84
		Triple Thru	B	14	0.37	B	18	0.53
		Right	B	14	0.27	B	16	0.21
	WB	Left	B	20	0.23	C	24	0.36
		Dual Thru-Thru/Right	D	38	0.85	D	36	0.66
	NB	Dual Left	E	74	0.83	E	65	0.76
		Thru-Thru/Right	D	35	0.06	D	49	0.37
	SB	Left	C	28	0.51	D	41	0.72
		Dual Thru	C	33	0.19	D	44	0.25
		Right (Channelized)	E	56	0.84	E	68	0.84
	Overall Intersection		***D***	***36***	***0.84***	***D***	***39***	***0.76***

Intersection	Approach/Movement		AM Peak Hour			PM Peak Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
Bayview Dr./ South Village Way *Signalized*	EB	Left/Thru-Thru/Right	D	44	0.02	D	44	0.49
	WB	Left	D	40	0.17	D	37	0.19
		Thru/Right	D	39	0.00	D	35	0.01
	NB	Left	A	4	0.13	A	6	0.26
		Thru-Thru/Right	A	5	0.19	A	8	0.32
	SB	Left	A	5	0.01	A	7	0.02
		Thru-Thru/Right	A	9	0.40	B	11	0.46
	Overall Intersection		***A***	***9***	***0.36***	***B***	***15***	***0.44***
Bayview Dr./ North Village Way *Signalized*	EB	Left	D	40	0.17	D	39	0.50
		Thru	A	< 1	0.00	D	39	0.00
		Right	D	46	0.02	D	39	0.07
	WB	Left	D	54	0.19	D	48	0.02
		Thru/Right	A	< 1	0.00	D	49	0.00
	NB	Left	A	3	0.10	A	6	0.22
		Thru-Thru/Right	A	5	0.17	A	6	0.32
	SB	Left	A	4	0.01	A	< 1	0.00
		Thru-Thru/Right	A	7	0.38	B	12	0.48
	Overall Intersection		***A***	***8***	***0.36***	***B***	***12***	***0.50***
Bayview Dr./ Concert Way-Churchill Dr. *Signalized*	EB	Left	D	37	0.19	D	37	0.25
		Thru	A	< 1	0.00	D	42	0.07
		Right	D	40	0.01	D	41	0.04
	WB	Left	D	39	0.09	D	37	0.16
		Thru/Right	A	42	0.13	D	42	0.05
	NB	Left	A	7	0.12	B	13	0.19
		Thru-Thru/Right	A	9	0.19	B	19	0.46
	SB	Left	A	6	0.10	B	13	0.22
		Thru-Thru/Right	B	11	0.43	C	21	0.56
	Overall Intersection		***B***	***15***	***0.37***	***C***	***22***	***0.44***
Bayview Dr./Coca Cola D/W-Industrial D/W South *Unsignalized*	EB	Left/Thru/Right	B	15	0.02	C	17	0.10
	WB	Left/Thru/Right	B	15	0.04	C	17	0.24
	NB	Left	A	10	0.01	A	10	0.01
		Thru-Thru/Right	Unopposed Movement			Unopposed Movement		
	SB	Left	A	9	0.01	A	9	0.01
		Thru-Thru/Right	Unopposed Movement			Unopposed Movement		
Bayview Dr./ Medical Centre South D/W – Industrial D/W North *Unsignalized*	EB	Left	C	17	0.08	C	19	0.30
		Right	B	12	0.04	B	11	0.16
	NB	Left	B	10	0.13	A	9	0.05
		Dual Thru	Unopposed Movement			Unopposed Movement		
	SB	Thru-Thru/Right	Unopposed Movement			Unopposed Movement		

Intersection	Approach/Movement		AM Peak Hour			PM Peak Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
Bayview Dr./Medical Centre North D/W *Unsignalized*	EB	Left/Right	B	14	0.03	B	13	0.12
	NB	Left	A	10	0.03	A	9	0.01
		Dual Thru	Unopposed Movement			Unopposed Movement		
	SB	Thru-Thru/Right	Unopposed Movement			Unopposed Movement		
Bayview Dr./ Big Bay Point Road *Signalized*	EB	Left	C	21	0.48	C	30	0.63
		Dual Thru	C	30	0.52	D	40	0.71
		Right	C	30	0.50	C	33	0.27
	WB	Left	C	20	0.58	C	37	0.76
		Dual Thru	C	28	0.49	D	35	0.46
		Right	C	25	0.22	C	31	0.09
	NB	Left	C	23	0.25	C	30	0.78
		Thru-Thru/Right	C	29	0.31	C	29	0.44
	SB	Left	C	24	0.15	C	32	0.31
		Dual Thru	C	29	0.21	D	40	0.38
		Right	C	29	0.15	D	39	0.23
	Overall Intersection		***C***	***27***	***0.47***	***C***	***35***	***0.80***
Bryne Dr./ Harvie Road *Signalized*	EB	Left	B	19	0.01	C	31	0.02
		Dual Thru	C	22	0.26	D	37	0.50
		Right	B	19	0.00	C	30	0.00
	WB	Left	C	21	0.12	D	40	0.38
		Dual Thru	C	21	0.13	D	37	0.51
		Right	C	20	0.09	C	30	0.02
	NB	Left	B	17	0.02	A	10	0.07
		Dual Thru	B	18	0.06	B	10	0.16
		Right	B	18	0.06	A	10	0.05
	SB	Left	B	19	0.18	B	16	0.48
		Dual Thru	B	19	0.15	B	10	0.15
		Right	B	18	0.05	A	10	0.06
	Overall Intersection		***B***	***20***	***0.22***	***C***	***24***	***0.49***

5.1.3 Queue Analysis – 2026 Background

Table 5.2 presents the results for the 95th and 50th percentile queue lengths. The individual movements where the 95th and 50th percentile queue lengths exceed the available storage lane lengths are highlighted in yellow and red, respectively.

The queue analysis shows there are relatively minor deficiencies during both the AM or PM peak hour where either the 95th or 50th percentile queues could occasionally and temporarily exceed the available storage lane lengths. For the intersections where mitigation was proposed to address operational issues, i.e. for the westbound right turn at Mapleview Drive/ Highway 400 Northbound Off/On Ramp and the southbound right turn at Mapleview Drive/Park Place Boulevard-Costco Access, queues are shorter, and any remaining deficiencies are minor.

As noted previously, there are physical constraints to increasing storage lane lengths in most cases. Therefore, solutions for future conditions would be a combination of specific operational improvements along the Mapleview Drive corridor that the City may determine through their upcoming *"Multi-Modal Level of Service/Traffic Study"* as well as improvements to other parts of the City road network that would provide more capacity overall and allow for a redistribution of traffic.

For the Mapleview Drive/Highway 400 Northbound Off/On Ramps intersection, the 95th and 50th percentile queues for the northbound off ramp are well within the available total ramp storage lengths for both the AM and PM peak hours.

For the Mapleview Drive/Highway 400 Southbound Off/On Ramps intersection, the 95th and 50th percentile queues for both the dual right and dual left turn lanes are well within the available total ramp storage lengths for both the AM and PM peak hours.

These background queuing conditions are anticipated to be improved by the 2031 Horizon Year with additional external network improvements in place (i.e., Essa interchange improvements, Bryne Drive extension, McKay Interchange, etc.).

TABLE 5.2: QUEUES – 2026 BACKGROUND

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Mapleview Dr./ Bryne Dr. *Signalized*	EB	Left	40 TWLTL	20	20	9	31	25	15	12	28
		Dual Thru-Thru/Right	260	82	178	46	214	63	197	32	228
	WB	Left	40 TWLTL	37	3	31	9	37	3	19	21
		Dual Thru-Thru/Right	160	97	63	49	111	19	141	5	155
	NB	Left	65	28	37	14	51	42	23	24	41
		Thru-Thru/Right	100	20	80	10	90	66	34	34	66
	SB	Left	40 TWLTL	16	24	6	34	40	0	20	20
		Thru-Thru/Right	330	32	298	17	313	28	302	13	317
Mapleview Dr./ Barrie View Dr. *Signalized*	EB	Left	80 TWLTL	11	69	4	76	37	43	11	69
		Triple Thru-Thru/Right	160	59	101	28	132	93	67	61	99
	WB	Dual Left	65	61	4	45	20	61	4	39	26
		Dual Thru-Thru/Right	100	88	12	54	46	114	-14	70	30
	NB	Left	35	5	30	1	34	18	17	7	28
		Thru	50	10	40	3	47	19	31	8	42
		Right	50	34	16	19	31	103	-53	89	-39
	SB	Left	35	53	-18	45	-10	51	-16	46	-11
		Thru-Thru/Right	290	116	174	53	237	212	78	114	176

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Mapleview Dr./ HWY 400 SB Off/On Ramp *Signalized*	EB	Quad Thru	100	116	-16	73	27	114	-14	66	34
		Right	55	50	5	17	38	31	24	12	43
	WB	Left	130	119	11	67	63	93	37	54	76
		Triple Thru	165	76	89	40	125	65	100	39	126
	SB	Dual Left	530	397	-102	279	16	378	-83	345	-50
		Dual Right	530	337	-42	200	95	426	-131	223	72
Mapleview Dr./ HWY 400 NB Off/On Ramp *Signalized*	EB	Dual Left	135	52	83	25	110	155	-20	90	45
		Triple Thru	165	45	120	11	154	122	43	57	108
	WB	Triple Thru	205	141	64	68	137	146	59	62	143
		Right	150	83	67	53	97	190	-40	140	10
	NB	Dual Left	560	58	207	34	231	86	179	59	206
		Dual Right	560	50	215	29	236	82	183	52	213
Mapleview Dr./ HWY 400 NB Off/On Ramp *Mitigation* *Signalized*	EB	Dual Left	135	47	88	28	107	74	61	44	91
		Triple Thru	165	49	116	10	155	68	97	23	142
	WB	Triple Thru	205	198	7	97	108	118	87	74	131
		Right (Channel-Yield)	150	35	115	8	142	114	36	68	82
	NB	Dual Left	560	52	213	30	235	83	182	58	207
		Dual Right	560	57	208	33	232	78	187	53	212
Mapleview Dr./ Park Place Blvd. *Signalized*	EB	Dual Left	165	47	118	33	132	115	50	66	99
		Triple Thru	205	62	143	41	164	140	65	81	124
		Right	185	9	176	3	182	10	175	4	181
	WB	Left	60	21	39	4	56	41	19	13	47
		Triple Thru	125	165	-40	124	1	146	-21	133	-8
		Right	125	192	-67	73	52	197	-72	150	-25
	NB	Dual Left	65	47	18	29	36	133	-68	133	-68
		Thru/Right	65	14	51	5	60	181	-116	87	-22
	SB	Left	65	13	52	5	60	65	0	41	24
		Thru	85	6	79	2	83	118	-33	47	38
		Right	85	42	43	23	62	101	-16	101	-16

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Mapleview Dr./ Park Place Blvd. *Mitigation* *Signalized*	EB	Dual Left	165	48	117	34	131	111	54	61	104
		Triple Thru	205	61	144	37	168	108	97	63	142
		Right	185	6	179	2	183	10	175	4	181
	WB	Left	60	18	42	3	57	40	20	14	46
		Triple Thru	125	154	-29	102	23	168	-43	117	8
		Right	125	138	-13	39	86	198	-73	82	43
	NB	Dual Left	65	45	20	26	39	138	-73	134	-69
		Thru/Right	65	11	54	4	61	178	-113	79	-14
	SB	Left	65	14	51	5	60	78	-13	58	7
		Thru	85	8	77	3	82	136	-51	69	16
		Right (Overlap)	85	39	46	21	64	119	-34	94	-9
Mapleview Dr./ Bayview Dr. *Signalized*	EB	Dual Left	80	63	17	42	38	76	4	56	24
		Triple Thru	125	33	92	18	107	50	75	31	94
		Right	45	52	-7	30	15	35	10	18	27
	WB	Left	125	60	65	14	111	20	105	8	117
		Dual Thru-Thru/Right	705	309	396	233	472	329	376	251	454
	NB	Dual Left	150	62	88	35	115	82	68	52	98
		Thru-Thru/Right	80	18	62	7	73	47	33	25	55
	SB	Left	100	92	8	52	48	98	2	61	39
		Dual Thru	210	97	113	38	172	272	-62	143	67
		Right (Channelized)	65	95	-30	51	14	104	-39	70	-5

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Bayview Dr./ South Village Way *Signalized*	EB	Left/Thru-Thru/Right	65	19	46	8	57	47	18	27	38
	WB	Left	50	17	33	5	45	20	30	8	42
		Thru/Right	50	7	43	1	49	9	41	23	27
	NB	Left	45	21	24	8	37	31	14	15	30
		Thru-Thru/Right	210	35	175	11	199	58	152	25	185
	SB	Left	40	4	36	1	39	7	33	2	38
		Thru-Thru/Right	185	79	106	33	152	164	21	80	105
Bayview Dr./ North Village Way *Signalized*	EB	Left	45	18	27	8	37	37	8	21	24
		Thru	85	0	85	0	85	11	74	1	84
		Right	45	21	24	8	37	33	12	16	29
	WB	Left	60	7	53	2	58	0	60	0	60
		Thru/Right	60	0	60	0	60	3	57	1	59
	NB	Left	50	14	36	5	45	20	30	9	41
		Thru-Thru/Right	185	22	163	6	179	37	148	14	171
	SB	Left	55	3	52	1	54	0	55	0	55
		Thru-Thru/Right	235	59	176	27	208	100	135	50	185
Bayview Dr./ Concert Way-Churchill Dr. *Signalized*	EB	Left	85	15	70	6	79	29	56	16	69
		Thru	130	0	130	0	130	13	117	5	125
		Right	85	12	73	4	81	17	68	8	77
	WB	Left	35	14	21	5	30	23	12	10	25
		Thru/Right	650	32	618	20	630	15	635	6	644
	NB	Left	50	24	26	9	41	23	27	9	41
		Thru-Thru/Right	235	30	205	12	223	71	164	44	191
	SB	Left	45	19	26	8	37	25	20	11	34
		Thru-Thru/Right	200	60	140	31	169	94	106	66	134

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Bayview Dr./Coca Cola D/W – Industrial D/W South *Unsignalized*	EB	Left/Thru/Right	100	9	91	3	97	18	82	8	92
	WB	Left/Thru/Right	100	15	85	5	95	44	56	19	81
	NB	Left	50	6	44	1	49	5	45	1	49
		Thru-Thru/Right	-	Unopposed Movement				Unopposed Movement			
	SB	Left	50	6	44	1	49	1	49	1	49
		Thru-Thru/Right	-	Unopposed Movement				Unopposed Movement			
Bayview Dr./ Medical Centre South D/W – Industrial D/W North *Unsignalized*	EB	Left	35	16	19	7	28	41	-6	21	14
		Right	35	13	22	6	29	18	17	11	24
	NB	Left	35	19	16	11	24	13	22	5	30
		Dual Thru	200	Unopposed Movement				Unopposed Movement			
	SB	Thru-Thru/Right	100	Unopposed Movement				Unopposed Movement			
Bayview Dr./Medical Centre North D/W *Unsignalized*	EB	Left/Right	35	11	24	4	31	26	9	12	23
	NB	Left	25	11	14	4	21	6	19	1	24
		Dual Thru	130	Unopposed Movement				Unopposed Movement			
	SB	Thru-Thru/Right	90	Unopposed Movement				Unopposed Movement			
Bayview Dr./ Big Bay Point Road *Signalized*	EB	Left	40	52	-12	28	12	88	-48	51	-11
		Dual Thru	300	68	232	43	257	112	188	73	227
		Right	50	60	-10	35	15	77	-27	35	15
	WB	Left	50	59	-9	34	16	78	-28	44	6
		Dual Thru	745	68	677	43	702	73	672	47	698
		Right	50	36	14	17	33	27	23	13	37
	NB	Left	50	39	11	18	32	94	-44	61	-11
		Thru-Thru/Right	200	56	144	33	167	92	108	49	151
	SB	Left	65	24	41	11	54	29	36	15	50
		Dual Thru	650	42	608	24	626	51	599	32	618
		Right	65	42	23	22	43	55	10	31	34

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Bryne Dr./ Harvie Road *Signalized*	EB	Left	60	6	54	1	59	7	53	1	59
		Dual Thru	300	47	253	28	272	71	229	49	251
		Right	60	6	54	1	59	5	55	1	59
	WB	Left	60	21	39	9	51	33	27	16	44
		Dual Thru	300	137	163	20	280	63	237	42	258
		Right	60	22	38	12	48	13	47	4	56
	NB	Left	60	7	53	2	58	14	46	6	54
		Dual Thru	300	21	279	11	289	39	261	25	275
		Right	60	14	46	7	53	12	48	5	55
	SB	Left	60	33	27	19	41	71	-11	43	17
		Dual Thru	300	42	258	25	275	52	248	22	278
		Right	60	12	48	5	55	14	46	6	54

5.1.4 Capacity Analysis – 2026 Total

Table 5.3 presents the results of the analysis of AM and PM peak hour total traffic operations. V/C ratios greater than the MTO criteria are highlighted. **Appendix E** contains the Synchro analysis reports.

The analysis indicates similar traffic operations in both the Mapleview Drive and Bayview Drive corridors as found for the 2026 background traffic conditions. In terms of the net impact of the proposed residential development, there are relatively minor increases in v/c ratios at most intersections in the study area. The additional traffic added to most intersections would less than 5%. It is noted that this would be less than daily traffic variations experienced which are typically in the range of 10-12%.

For any intersections with movements forecast to be exceeding the theoretical capacity, mitigation measures as considered in the analysis of the background traffic conditions have been assessed. The results with mitigation measures in place are shown in the next row of the table.

The intersections where mitigation measures have been considered are as follows:

Mapleview Drive/Highway 400 Northbound Off/On Ramps

- The initial analysis showed that this intersection would be over capacity primarily due to high v/c ratios for the eastbound left turn and westbound right turn movements and two other movements would have v/c ratios above the 0.85 or 0.75 criteria in the PM peak hour;
- The key problem movement is the westbound right turn from Mapleview Drive to Highway 400 northbound. It is noted that no site generated traffic would be added to this movement based upon the trip distribution and assignment to the network;
- With a channelized right turn design as previously described, the intersection operation would be within capacity and at a good level of service (C). This is the same level of service as under background traffic conditions and similar v/c ratio. It is re-stated that the implementation of this type of improvement would likely represent a throw-way cost as related to the eventual future implementation of the MTO-recommended DDI design; and
- It is also re-stated that as we understand City staff intend to carry out a “Multi-Modal Level of Service/Traffic Study” for the Mapleview Drive corridor. This will provide a focused

opportunity to assess additional alternatives for shorter term operational and design solutions for the Mapleview Drive/ Highway 400 Northbound Off/On Ramps intersection and to consider ways to avoid throw-away costs in light of the longer term solution of the MTO-recommended DDI.

Mapleview Drive/Park Place Boulevard-Costco Access

- The initial analysis showed that this intersection would be over capacity and several movements would have v/c ratios above the 0.85 criteria during the PM peak hour. The overall intersection level service is F;
- The key problem movement is the southbound right turn from Park Place Boulevard to Mapleview Drive (v/c of 1.35);
- With a southbound right turn overlap phase as previously described, the overall intersection operation and the southbound right turn movement would operate with improved conditions (v/c of 0.99 and 1.06, respectively). The overall intersection level of service improves from F to D; and
- It is re-stated that as we understand City staff intend to carry out a *"Multi-Modal Level of Service/Traffic Study"* for the Mapleview Drive corridor. Again, this will allow additional improvement alternatives to be examined for this intersection that would assist in addressing shorter term operational concerns while complementing other proposed improvements to the east and west of this intersection.

Consistent with the analysis of background traffic conditions, the Bayview Drive study area intersections operate well within capacity and at good levels of service.

The Bryne Drive/Harvie Road intersection is forecast to operate well within capacity and at a good level of service under both the AM and PM peak hours.

TABLE 5.3: OPERATIONAL ANALYSIS – 2026 TOTAL

Intersection	Approach/Movement		AM Peak Hour			PM Peak Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
Mapleview Dr./ Bryne Dr. *Signalized*	EB	Left	B	15	0.18	A	8	0.26
		Dual Thru-Thru/Right	C	23	0.51	B	12	0.35
	WB	Left	D	48	0.71	A	9	0.41
		Dual Thru-Thru/Right	A	4	0.35	A	1	0.38
	NB	Left	D	39	0.32	D	53	0.56
		Thru-Thru/Right	D	42	0.08	E	57	0.40
	SB	Left	D	42	0.13	E	58	0.63
		Thru-Thru/Right	D	45	0.23	E	55	0.21
	Overall Intersection		***C***	***22***	***0.67***	***B***	***18***	***0.46***
Mapleview Dr./ Barrie View Dr. *Signalized*	EB	Left	A	9	0.13	C	25	0.25
		Triple Thru-Thru/Right	A	10	0.45	C	31	0.60
	WB	Dual Left	E	57	0.71	E	66	0.81
		Dual Thru-Thru/Right	A	10	0.69	B	17	0.74
	NB	Left	D	44	0.02	D	37	0.10
		Thru	D	46	0.06	D	40	0.11
		Right	D	46	0.11	E	64	0.84
	SB	Left	D	42	0.77	D	36	0.69
		Thru-Thru/Right	C	31	0.02	C	30	0.04
	Overall Intersection		***B***	***19***	***0.77***	***C***	***33***	***0.80***
Mapleview Dr./ HWY 400 SB Off/On Ramp *Signalized*	EB	Quad Thru	C	29	0.74	C	30	0.83
		Right	B	16	0.26	B	15	0.33
	WB	Left	D	44	0.96	D	45	0.94
		Triple Thru	A	9	0.49	A	9	0.53
	SB	Dual Left	D	37	0.72	E	59	0.90
		Dual Right	D	47	0.87	D	41	0.46
	Overall Intersection		***C***	***28***	***0.96***	***C***	***29***	***0.95***
Mapleview Dr./ HWY 400 NB Off/On Ramp *Signalized*	EB	Dual Left	D	38	0.69	E	63	1.01
		Triple Thru	A	4	0.46	B	13	0.56
	WB	Triple Thru	A	6	0.61	C	24	0.73
		Right	D	43	0.57	F	104	1.16
	NB	Dual Left	D	44	0.57	D	53	0.75
		Dual Right	D	47	0.64	E	67	0.90
	Overall Intersection		***B***	***18***	***0.63***	***D***	***45***	***1.06***

Intersection	Approach/Movement		AM Peak Hour			PM Peak Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
Mapleview Dr./ HWY 400 NB Off/On Ramp *Mitigation* *Signalized*	EB	Dual Left	D	38	0.69	D	38	0.88
		Triple Thru	A	4	0.46	A	7	0.57
	WB	Triple Thru	A	6	0.61	C	26	0.80
		Right (Channel/Yield)	A	1	0.53	A	1	0.72
	NB	Dual Left	D	44	0.57	D	52	0.73
		Dual Right	D	47	0.64	E	65	0.88
	Overall Intersection		***B***	***11***	***0.64***	***C***	***23***	***0.84***
Mapleview Dr./ Park Place Blvd. *Signalized*	EB	Dual Left	E	61	0.51	F	198	1.25
		Triple Thru	A	5	0.54	E	60	1.06
		Right	A	9	0.02	A	7	0.04
	WB	Left	B	11	0.06	C	35	0.43
		Triple Thru	C	25	0.96	E	65	1.03
		Right	A	1	0.06	C	23	0.27
	NB	Dual Left	D	48	0.56	E	60	0.91
		Thru/Right	D	44	0.07	D	37	0.16
	SB	Left	D	49	0.27	E	59	0.73
		Thru	D	47	0.07	D	45	0.15
		Right	D	47	0.13	F	234	1.35
	Overall Intersection		***C***	***22***	***0.73***	***F***	***84***	***1.12***
Mapleview Dr./ Park Place Blvd. *Mitigation* *Signalized*	EB	Dual Left	E	59	0.51	F	83	0.96
		Triple Thru	A	5	0.51	C	34	0.94
		Right	A	8	0.02	B	14	0.04
	WB	Left	B	10	0.05	C	33	0.43
		Triple Thru	B	18	0.89	D	51	0.98
		Right	A	2	0.06	C	22	0.26
	NB	Dual Left	D	48	0.56	E	60	0.91
		Thru/Right	D	44	0.07	D	37	0.16
	SB	Left	D	54	0.44	F	111	0.99
		Thru	D	51	0.11	D	51	0.20
		Right (Overlap)	C	34	0.13	F	109	1.06
	Overall Intersection		***B***	***18***	***0.73***	***D***	***55***	***0.99***
Mapleview Dr./ Bayview Dr. *Signalized*	EB	Dual Left	E	67	0.80	E	71	0.85
		Triple Thru	B	15	0.38	B	19	0.55
		Right	B	15	0.28	B	17	0.22
	WB	Left	C	21	0.24	C	25	0.37
		Dual Thru-Thru/Right	D	40	0.87	D	38	0.70
	NB	Dual Left	E	74	0.83	E	66	0.77
		Thru-Thru/Right	C	35	0.06	D	48	0.37
	SB	Left	C	28	0.52	D	41	0.74
		Dual Thru	C	33	0.19	D	43	0.25
		Right (Channelized)	E	57	0.85	E	69	0.85
	Overall Intersection		***D***	***37***	***0.85***	***D***	***41***	***0.79***

Intersection	Approach/Movement		AM Peak Hour			PM Peak Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
Bayview Dr./ South Village Way *Signalized*	EB	Left/Thru-Thru/Right	D	44	0.11	D	45	0.54
	WB	Left	D	40	0.17	D	37	0.21
		Thru/Right	D	39	0.00	D	35	0.01
	NB	Left	A	4	0.14	A	7	0.29
		Thru-Thru/Right	A	5	0.19	A	8	0.33
	SB	Left	A	5	0.01	A	9	0.03
		Thru-Thru/Right	A	9	0.40	B	13	0.49
	Overall Intersection		***A***	***10***	***0.37***	***B***	***16***	***0.48***
Bayview Dr./ North Village Way *Signalized*	EB	Left	D	40	0.21	D	40	0.57
		Thru	A	< 1	0.00	D	39	0.00
		Right	D	45	0.03	D	39	0.08
	WB	Left	D	53	0.19	D	48	0.02
		Thru/Right	A	< 1	0.00	D	49	0.00
	NB	Left	A	3	0.10	A	7	0.26
		Thru-Thru/Right	A	5	0.18	A	6	0.32
	SB	Left	A	4	0.01	A	< 1	0.00
		Thru-Thru/Right	A	7	0.38	B	12	0.51
	Overall Intersection		***A***	***8***	***0.37***	***B***	***13***	***0.53***
Bayview Dr./ Concert Way-Churchill Dr. *Signalized*	EB	Left	D	37	0.27	D	38	0.28
		Thru	A	< 1	0.00	D	42	0.07
		Right	D	40	0.02	D	41	0.04
	WB	Left	D	39	0.09	D	38	0.16
		Thru/Right	D	42	0.13	D	42	0.05
	NB	Left	A	7	0.13	B	14	0.21
		Thru-Thru/Right	A	10	0.20	B	20	0.48
	SB	Left	A	6	0.10	B	13	0.23
		Thru-Thru/Right	B	11	0.43	C	22	0.59
	Overall Intersection		***B***	***15***	***0.39***	***C***	***23***	***0.47***
Bayview Dr./Coca Cola D/W-Industrial D/W South *Unsignalized*	EB	Left/Thru/Right	B	15	0.02	C	18	0.11
	WB	Left/Thru/Right	B	15	0.04	C	18	0.25
	NB	Left	A	10	0.01	A	10	0.01
		Thru-Thru/Right	Unopposed Movement			Unopposed Movement		
	SB	Left	A	9	0.01	A	9	0.01
		Thru-Thru/Right	Unopposed Movement			Unopposed Movement		
Bayview Dr./ Medical Centre South D/W – Industrial D/W North *Unsignalized*	EB	Left	C	17	0.08	C	20	0.32
		Right	B	12	0.04	B	11	0.16
	NB	Left	B	11	0.13	A	10	0.05
		Dual Thru	Unopposed Movement			Unopposed Movement		
	SB	Thru-Thru/Right	Unopposed Movement			Unopposed Movement		

Intersection	Approach/Movement		AM Peak Hour			PM Peak Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
Bayview Dr./Medical Centre North D/W *Unsignalized*	EB	Left/Right	B	14	0.03	B	14	0.13
	NB	Left	A	10	0.03	A	9	0.01
		Dual Thru	Unopposed Movement			Unopposed Movement		
	SB	Thru-Thru/Right	Unopposed Movement			Unopposed Movement		
Bayview Dr./ Big Bay Point Road *Signalized*	EB	Left	C	21	0.48	C	30	0.63
		Dual Thru	C	30	0.52	D	40	0.71
		Right	C	30	0.50	C	33	0.29
	WB	Left	C	20	0.59	C	41	0.81
		Dual Thru	C	28	0.48	D	35	0.46
		Right	C	25	0.22	C	31	0.09
	NB	Left	C	23	0.25	C	33	0.82
		Thru-Thru/Right	C	30	0.34	C	30	0.46
	SB	Left	C	24	0.15	C	32	0.32
		Dual Thru	C	29	0.22	D	41	0.42
		Right	C	29	0.15	D	39	0.23
	Overall Intersection		***C***	***28***	***0.49***	***C***	***36***	***0.84***
Bryne Dr./ Harvie Road *Signalized*	EB	Left	B	19	0.01	C	31	0.02
		Dual Thru	C	22	0.26	D	37	0.51
		Right	B	19	0.00	C	30	0.00
	WB	Left	C	21	0.12	D	40	0.39
		Dual Thru	C	21	0.13	D	37	0.52
		Right	C	20	0.09	C	30	0.02
	NB	Left	B	17	0.02	A	10	0.07
		Dual Thru	B	18	0.06	B	10	0.16
		Right	B	18	0.06	A	10	0.05
	SB	Left	B	19	0.18	B	16	0.48
		Dual Thru	B	19	0.15	B	10	0.15
		Right	B	18	0.05	A	10	0.06
	Overall Intersection		***B***	***20***	***0.22***	***C***	***24***	***0.49***

5.1.5 Queue Analysis – 2026 Total

Table 5.4 presents the results for the 95th and 50th percentile queue lengths. The individual movements where the 95th and 50th percentile queue lengths exceed the available storage lane lengths are highlighted in yellow and red, respectively.

The queue analysis showed that there are relatively minor deficiencies during both the AM or PM peak hour where either the 95th or 50th percentile queues could occasionally and temporarily exceed the available storage lane lengths. For the intersections where mitigation was proposed to address operational issues, i.e. for the westbound right turn at Mapleview Drive/ Highway 400 Northbound Off/On Ramp and the southbound right turn at Mapleview Drive/Park Place Boulevard-Costco Access, queues are shorter, and any remaining deficiencies are minor.

As noted previously, there are physical constraints to increasing storage lane lengths in most cases. Therefore, solutions for future conditions would be a combination of specific operational improvements along the Mapleview Drive corridor that the City may determine through their upcoming *"Multi-Modal Level of Service/Traffic Study"* as well as improvements to other parts of the City road network that would provide more capacity overall and allow for a redistribution of traffic.

For the Mapleview Drive/Highway 400 Northbound Off/On Ramps intersection, the 95th and 50th percentile queues for the northbound off ramp are well within the available total ramp storage lengths under both the AM and PM peak hours.

For the Mapleview Drive/Highway 400 Southbound Off/On Ramps intersection, the 95th and 50th percentile queues for the southbound off ramp are within the total ramp storage lengths under both the AM and PM peak hours.

TABLE 5.4: QUEUES – 2026 TOTAL

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Mapleview Dr./ Bryne Dr. *Signalized*	EB	Left	40 TWLTL	17	23	9	31	22	18	11	29
		Dual Thru-Thru/Right	260	81	179	47	213	61	199	33	227
	WB	Left	40 TWLTL	36	4	31	9	35	5	18	22
		Dual Thru-Thru/Right	160	96	64	48	112	13	147	4	156
	NB	Left	65	32	33	17	48	41	24	22	43
		Thru-Thru/Right	100	21	79	10	90	60	40	32	68
	SB	Left	40 TWLTL	14	26	5	35	37	3	21	19
		Thru-Thru/Right	330	33	297	18	312	30	300	13	317
Mapleview Dr./ Barrie View Dr. *Signalized*	EB	Left	80 TWLTL	11	69	3	77	36	44	10	70
		Triple Thru-Thru/Right	160	61	99	29	131	94	66	63	97
	WB	Dual Left	65	60	5	43	22	65	0	42	23
		Dual Thru-Thru/Right	100	89	11	56	44	107	-7	64	36
	NB	Left	35	4	31	1	34	13	22	4	31
		Thru	50	9	41	3	47	23	27	9	41
		Right	50	36	14	20	30	91	-41	91	-41
	SB	Left	35	55	-20	43	-8	53	-18	46	-11
		Thru-Thru/Right	290	152	138	58	232	195	95	96	194

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Mapleview Dr./ HWY 400 SB Off/On Ramp *Signalized*	EB	Quad Thru	100	126	-26	77	23	115	-15	68	32
		Right	55	58	-3	21	34	40	15	14	41
	WB	Left	130	108	22	60	70	109	21	58	72
		Triple Thru	165	62	103	37	128	66	99	37	128
	SB	Dual Left	530	408	-113	287	8	380	-85	343	-48
		Dual Right	530	407	-112	211	84	427	-132	228	67
Mapleview Dr./ HWY 400 NB Off/On Ramp *Signalized*	EB	Dual Left	135	54	81	29	106	149	-14	90	45
		Triple Thru	165	70	95	17	148	114	51	53	112
	WB	Triple Thru	205	127	78	67	138	152	53	64	141
		Right	150	77	73	52	98	183	-33	126	24
	NB	Dual Left	560	54	211	31	234	81	184	57	208
		Dual Right	560	56	209	32	233	87	178	58	207
Mapleview Dr./ HWY 400 NB Off/On Ramp *Mitigation* *Signalized*	EB	Dual Left	135	60	75	28	107	76	59	43	92
		Triple Thru	165	51	114	11	154	75	90	24	141
	WB	Triple Thru	205	195	10	98	107	112	93	74	131
		Right (Channel-Yield)	150	33	117	9	141	94	56	59	91
	NB	Dual Left	560	51	214	30	235	83	182	56	209
		Dual Right	560	52	213	30	235	88	177	62	203
Mapleview Dr./ Park Place Blvd. *Signalized*	EB	Dual Left	165	54	111	37	128	148	17	91	74
		Triple Thru	205	67	138	44	161	142	63	83	122
		Right	185	9	176	2	183	34	151	6	179
	WB	Left	60	18	42	3	57	42	18	14	46
		Triple Thru	125	160	-35	128	-3	149	-24	132	-7
		Right	125	203	-78	84	41	218	-93	132	-7
	NB	Dual Left	65	50	15	29	36	136	-71	133	-68
		Thru/Right	65	13	52	5	60	176	-111	77	-12
	SB	Left	65	17	48	8	57	73	-8	46	19
		Thru	85	8	77	2	83	134	-49	63	22
		Right	85	46	39	27	58	101	-16	101	-16

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Mapleview Dr./ Park Place Blvd. *Mitigation* *Signalized*	EB	Dual Left	165	51	114	37	128	68	97	49	116
		Triple Thru	205	62	143	38	167	116	89	76	129
		Right	185	8	177	2	183	12	173	4	181
	WB	Left	60	24	36	4	56	45	15	16	44
		Triple Thru	125	158	-33	114	11	151	-26	131	-6
		Right	125	175	-50	61	64	215	-90	115	10
	NB	Dual Left	65	50	15	28	37	137	-72	134	-69
		Thru/Right	65	12	53	5	60	181	-116	86	-21
	SB	Left	65	22	43	9	56	77	-12	58	7
		Thru	85	9	76	2	83	134	-49	63	22
		Right (Overlap)	85	46	39	26	59	121	-36	95	-10
Mapleview Dr./ Bayview Dr. *Signalized*	EB	Dual Left	80	64	16	43	37	78	2	55	25
		Triple Thru	125	36	89	20	105	53	72	34	91
		Right	45	58	-13	30	15	37	8	20	25
	WB	Left	125	60	65	15	110	19	106	7	118
		Dual Thru-Thru/Right	705	318	387	221	484	321	384	251	454
	NB	Dual Left	150	75	75	43	107	94	56	54	96
		Thru-Thru/Right	80	18	62	8	72	53	27	26	54
	SB	Left	100	96	4	55	45	110	-10	70	30
		Dual Thru	210	110	100	41	169	240	-30	110	100
		Right (Channelized)	65	95	-30	53	12	105	-40	66	-1

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Bayview Dr./ South Village Way *Signalized*	EB	Left/Thru-Thru/Right	65	20	45	10	55	50	15	31	34
	WB	Left	50	14	36	4	46	20	30	7	43
		Thru/Right	50	6	44	1	49	10	40	3	47
	NB	Left	45	25	20	10	35	34	11	15	30
		Thru-Thru/Right	210	35	175	12	198	63	147	26	184
	SB	Left	40	4	36	1	39	8	32	2	38
		Thru-Thru/Right	185	88	97	42	143	157	28	90	95
Bayview Dr./ North Village Way *Signalized*	EB	Left	45	22	23	9	36	40	5	25	20
		Thru	85	0	85	0	85	18	67	2	83
		Right	45	25	20	9	36	44	1	20	25
	WB	Left	60	7	53	2	58	4	56	1	59
		Thru/Right	60	0	60	0	60	4	56	1	59
	NB	Left	50	19	31	8	42	25	25	11	39
		Thru-Thru/Right	185	29	156	9	176	44	141	19	166
	SB	Left	55	3	52	1	54	0	55	0	55
		Thru-Thru/Right	235	63	172	29	206	189	46	81	154
Bayview Dr./ Concert Way-Churchill Dr. *Signalized*	EB	Left	85	20	65	9	76	31	54	16	69
		Thru	130	0	130	0	130	14	116	5	125
		Right	85	12	73	5	80	20	65	9	76
	WB	Left	35	11	24	4	31	25	10	11	24
		Thru/Right	650	35	615	21	629	21	629	8	642
	NB	Left	50	23	27	9	41	26	24	10	40
		Thru-Thru/Right	235	32	203	13	222	79	156	48	187
	SB	Left	45	17	28	7	38	34	11	13	32
		Thru-Thru/Right	200	65	135	33	167	95	105	64	136

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Bayview Dr./Coca Cola D/W – Industrial D/W South *Unsignalized*	EB	Left/Thru/Right	100	9	91	3	97	17	83	8	92
	WB	Left/Thru/Right	100	19	81	6	94	44	56	18	82
	NB	Left	50	5	45	1	49	6	44	1	49
		Thru-Thru/Right	-	Unopposed Movement				Unopposed Movement			
	SB	Left	50	6	44	1	49	4	46	1	49
		Thru-Thru/Right	-	Unopposed Movement				Unopposed Movement			
Bayview Dr./ Medical Centre South D/W – Industrial D/W North *Unsignalized*	EB	Left	35	15	20	6	29	49	-14	25	10
		Right	35	13	22	6	29	20	15	12	23
	NB	Left	35	18	17	10	25	13	22	5	30
		Dual Thru	200	Unopposed Movement				Unopposed Movement			
	SB	Thru-Thru/Right	100	Unopposed Movement				Unopposed Movement			
Bayview Dr./Medical Centre North D/W *Unsignalized*	EB	Left/Right	35	12	23	4	31	25	10	12	23
	NB	Left	25	13	12	5	20	7	18	2	23
		Dual Thru	130	Unopposed Movement				Unopposed Movement			
	SB	Thru-Thru/Right	90	Unopposed Movement				Unopposed Movement			
Bayview Dr./ Big Bay Point Road *Signalized*	EB	Left	40	48	-8	26	14	87	-47	50	-10
		Dual Thru	300	73	227	44	256	142	158	83	217
		Right	50	61	-11	33	17	81	-31	38	12
	WB	Left	50	60	-10	35	15	65	-15	39	11
		Dual Thru	745	66	679	42	703	67	678	48	697
		Right	50	31	19	15	35	20	30	12	38
	NB	Left	50	37	13	19	31	89	-39	60	-10
		Thru-Thru/Right	200	68	132	39	161	88	112	48	152
	SB	Left	65	24	41	10	55	31	34	16	49
		Dual Thru	650	41	609	24	626	55	595	35	615
		Right	65	42	23	22	43	57	8	31	34

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Bryne Dr./ Harvie Road *Signalized*	EB	Left	60	7	53	1	59	5	55	1	59
		Dual Thru	300	47	253	29	271	73	227	50	250
		Right	60	5	55	1	59	5	55	1	59
	WB	Left	60	23	37	10	50	36	24	18	42
		Dual Thru	300	32	268	16	284	67	233	45	255
		Right	60	23	37	13	47	18	42	5	55
	NB	Left	60	8	52	2	58	17	43	7	53
		Dual Thru	300	24	276	13	287	38	262	23	277
		Right	60	13	47	6	54	12	48	5	55
	SB	Left	60	28	32	16	44	63	-3	39	21
		Dual Thru	300	37	263	24	276	41	259	21	279
		Right	60	12	48	5	55	15	45	6	54

5.1.6 Effect of Harvie Road-Big Bay Point Road

The 2026 analysis shows that several intersections in the Mapleview Drive corridor would operate near or at-capacity during the PM peak hour as they do today. The factors that contribute to these conditions include the attraction of the Highway 400 interchange on Mapleview Drive, the continuity of Mapleview Drive as a major east-west arterial road, and the amount of retail-commercial development that is directly served from this road.

While the forecasts show that traffic will divert from Mapleview Drive during the PM peak hour, a significant amount of under-utilized capacity would be available in the Harvie Road-Big Bay Point Road corridor to accommodate more traffic diversion. Based on the 2026 PM peak hour forecasts factored to a 24-hour volume, this corridor would have an estimated 22,500 vehicles per day, i.e. approximately three-quarters of the 30,000 vehicles per day threshold that typically represents a rule-of-thumb capacity for four lane arterial roads. This threshold is based on four lane arterial roadways experiencing near or at capacity conditions during peak hour periods when their daily traffic volumes have reached 30,000 vehicles. Therefore, the reserve capacity in the Harvie Road-Big Bay Point Road corridor of approximately 7,500 vehicle per day (or 750 vehicles per hour) could be used as needed by non-Park Place traffic and Park Place-generated traffic to assist in maintaining traffic demands within capacity in the Mapleview Drive corridor.

As motorists become more familiar with the improved road network, the under-utilized Harvie Road-Big Bay Point Road corridor will likely attract traffic volumes that are higher than the forecasts. The diversion of more peak period traffic to new alternative routes will be beneficial for traffic operations in the Mapleview Drive corridor.

5.2 2031 Horizon

5.2.1 Methodology

The 2031 traffic forecasts were analyzed using the same methodology and parameters as in the analysis of 2026 conditions.

In regard to the Highway 400 ramp terminal intersections, while it is understood that the timing for implementing the Diverging Diamond Interchange (DDI) improvement is uncertain, the City has included it as part of the road network recommendations in the 2019 TMP and it is in the Emme model for the 2031 horizon.

Our analysis examines both the Diamond Interchange configuration and DDI configuration. This will provide insight on how the current Diamond Interchange configuration will operate in the event the DDI does not get implemented by the 2031 Horizon Year.

Figure 5.1, as extracted from the "Highway 400 Improvements from 1 km South of Highway 89 to the Junction of Highway 11, Transportation Environmental Study Report (TESR) Addendum, November 2017" (AECOM Canada Ltd.), illustrates the functional place for the recommended DDI. This type of interchange design in this location features a crossover of the eastbound and westbound lanes on Mapleview Drive and facilitates unopposed left turn and right turn movements from Mapleview Drive to the Highway 400 on ramps. Compared to the existing Diamond Interchange, this eliminates the potential conflicts between left turns and opposing through movements and simplifies traffic signal operations at the crossover points. These key differences result in an anticipated improvement in safety and efficiency.

5.2.2 Capacity Analysis – 2031 Background

Table 5.5 presents the results of the analysis of AM and PM peak hour background traffic operations. V/C ratios greater than the MTO criteria are highlighted. **Appendix F** contains the Synchro analysis reports.

The analysis indicates slightly improved traffic operations in the Mapleview Drive corridor compared to the 2026 analysis resulting from the additional east-west capacity provided by the Harvie Road-Big Bay Point Road flyover and the associated redistribution of traffic. For example, with the changes in traffic volumes at Highway 400 and Mapleview Drive, the previously identified need for a channelized right turn movement for westbound Mapleview Drive to the Highway 400 northbound on ramp would be redundant. (i.e., the movement is now within capacity; however, noted still to be near capacity) under the

Diamond Interchange configuration. Additionally, when analyzed under the DDI configuration all movements would be operating acceptable and within capacity. The exception would be one movement under the PM peak hour reporting a v/c ratio just slightly above the 0.85 criteria (v/c = 0.88).

Notwithstanding, parts of the Mapleview Drive corridor would continue to be operating close to capacity as evidenced by some intersections having volume demands at-capacity or having individual movements with v/c ratios greater than the 0.85 criteria. Where the more significant capacity deficiencies are evident, possible improvements have been considered and the results with mitigation measures in place are shown in the next row of the table.

The intersections where mitigation has been considered are as follows:

Mapleview Drive/Park Place Boulevard-Costco Access

- The initial analysis showed that this intersection would be at capacity (v/c of 1.06) and several movements would have v/c ratios exceeding the theoretical capacity during the PM peak hour;
- Consistent with the 2026 horizon, the key problem movement is the southbound right turn from Park Place Boulevard to Mapleview Drive;
- Also consistent with the 2026 horizon, the mitigation considered is to implement a right turn overlap phase that would run concurrently with the non-conflicting eastbound and westbound advanced left turn phases;
- The improvement results in the intersection operating within capacity (v/c of 0.96) and with less delay, a better level of service (D versus E), and the southbound right turn movement operating within capacity (v/c of 0.95), albeit near capacity; and
- As noted previously, City staff intend to carry out a “Multi-Modal Level of Service/Traffic Study” for the Mapleview Drive corridor. Again, this will allow additional improvement alternatives to be examined for this intersection that would assist in addressing shorter and longer term operational concerns while complementing other proposed improvements to the east and west of this intersection.

Consistent with the analysis of 2026 horizon year conditions, the Bayview Drive study area intersections operate within capacity and at good levels of service (D or better).

The Bryne Drive/Harvie Road intersection is forecast to operate well within capacity and at a good level of service under both the AM and PM peak hours.

The analysis results for the DDI show that the two ramp terminal intersections would operate at a very good level of service (C or better) in the AM and PM peak hours and well within capacity. These operational measures apply primarily to the through movements since as previously noted, left and right turns from Mapleview Drive to the Highway 400 on ramps operate as free flow although motorists making left turns could experience delay in the through lanes prior to reaching the taper section at the ramps. The exiting movements from the Highway 400 off ramps would operate at very good levels of service (C or better) and well within capacity.

It should be understood, however, that the improved operations at the interchange will not likely carry over to the adjacent Mapleview Drive intersections during the busiest conditions. The traffic reporting that was part of the MTO 2017 Transportation Environmental Study Report concluded that the PM peak hour traffic operations of adjacent intersections would be independent of the configuration of the interchange – i.e. the implementation of the DDI neither improves nor worsens the traffic operations at other intersections in the study area section of the Mapleview Drive corridor, it only improves ramp terminal operations.

TABLE 5.5: OPERATIONAL ANALYSIS – 2031 BACKGROUND

Intersection	Approach/Movement		AM Peak Hour			PM Peak Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
Mapleview Dr./ Bryne Dr. *Signalized*	EB	Left	B	15	0.17	A	9	0.36
		Dual Thru-Thru/Right	C	24	0.60	B	15	0.45
	WB	Left	E	57	0.76	D	40	0.58
		Dual Thru-Thru/Right	A	6	0.42	A	2	0.41
	NB	Left	D	42	0.46	D	50	0.44
		Thru-Thru/Right	D	44	0.06	E	57	0.44
	SB	Left	D	42	0.16	D	53	0.34
		Thru-Thru/Right	D	46	0.21	E	56	0.10
	Overall Intersection		***C***	***23***	***0.74***	***B***	***18***	***0.58***
Mapleview Dr./ Barrie View Dr. *Signalized*	EB	Left	B	11	0.21	B	18	0.32
		Triple Thru-Thru/Right	A	5	0.45	B	19	0.56
	WB	Dual Left	E	58	0.69	E	73	0.76
		Dual Thru-Thru/Right	A	8	0.70	A	10	0.65
	NB	Left	D	45	0.04	D	45	0.21
		Thru	D	46	0.02	D	50	0.32
		Right	D	47	0.10	E	66	0.75
	SB	Left	D	44	0.73	D	46	0.74
		Thru-Thru/Right	D	35	0.04	D	38	0.03
	Overall Intersection		***B***	***16***	***0.76***	***C***	***27***	***0.73***
Mapleview Dr./ HWY 400 SB Off/On Ramp *Signalized*	EB	Quad Thru	C	20	0.68	C	25	0.80
		Right	A	6	0.19	A	9	0.21
	WB	Left	D	47	0.95	D	41	0.93
		Triple Thru	A	9	0.55	B	10	0.53
	SB	Dual Left	D	37	0.69	D	55	0.83
		Dual Right	D	44	0.83	D	42	0.34
	Overall Intersection		***C***	***24***	***0.93***	***C***	***25***	***0.93***
Mapleview Dr./ HWY 400 NB Off/On Ramp *Signalized*	EB	Dual Left	D	36	0.67	D	51	0.95
		Triple Thru	A	8	0.50	B	15	0.58
	WB	Triple Thru	A	5	0.62	C	20	0.77
		Right	D	40	0.51	D	38	0.97
	NB	Dual Left	D	47	0.74	D	50	0.66
		Dual Right	D	40	0.37	E	68	0.90
	Overall Intersection		***B***	***18***	***0.66***	***C***	***31***	***0.95***

Intersection	Approach/Movement		AM Peak Hour			PM Peak Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
Mapleview Dr./ HWY 400 NB Off/On Ramp *Mitigation* *Signalized*	EB	Dual Left	D	36	0.67	D	39	0.88
		Triple Thru	A	8	0.50	B	12	0.58
	WB	Triple Thru	A	5	0.62	B	19	0.80
		Right (Channel/Yield)	A	1	0.50	A	1	0.65
	NB	Dual Left	D	47	0.74	D	49	0.65
		Dual Right	D	40	0.37	E	65	0.89
	Overall Intersection		***B***	***12***	***0.66***	***C***	***22***	***0.84***
Mapleview Dr./ HWY 400 West Terminal *DDI* *Signalized*	EB	Triple Through	C	31	0.75	C	33	0.84
	WB	Triple Through	B	10	0.65	C	23	0.82
	Overall Intersection		***B***	***20***	***0.69***	***C***	***28***	***0.83***
	W-S Ramp (Right)		A	< 1	0.11	A	< 1	0.11
	E-S Ramp (Left)		A	6	0.27	A	6	0.28
	N-W Ramp (Dual Right)		C	26	0.58	B	20	0.20
	N-E Ramp (Dual Left)		C	20	0.41	C	27	0.44
Mapleview Dr./ HWY 400 East Terminal *DDI* *Signalized*	EB	Triple Through	B	19	0.82	C	25	0.88
	WB	Triple Through	C	25	0.71	C	33	0.79
	Overall Intersection		***C***	***22***	***0.76***	***C***	***29***	***0.83***
	W-N Ramp (Left)		A	5	0.19	A	7	0.40
	E-N Ramp (Right)		A	< 1	0.43	A	< 1	0.60
	S-E Ramp (Dual Right)		B	19	0.20	C	27	0.46
	S-W Ramp (Dual Left)		B	19	0.30	C	22	0.29
Mapleview Dr./ Park Place Blvd. *Signalized*	EB	Dual Left	E	60	0.50	F	175	1.19
		Triple Thru	A	4	0.51	D	36	0.99
		Right	A	9	0.02	A	5	0.04
	WB	Left	A	8	0.08	D	38	0.49
		Triple Thru	B	19	0.96	E	72	1.07
		Right	A	1	0.06	B	15	0.27
	NB	Dual Left	D	48	0.48	D	55	0.83
		Thru/Right	D	45	0.09	D	41	0.19
	SB	Left	D	48	0.19	D	55	0.68
		Thru	D	47	0.07	D	45	0.14
		Right	D	48	0.11	F	193	1.26
	Overall Intersection		***B***	***19***	***0.72***	***E***	***71***	***1.06***

Intersection	Approach/Movement		AM Peak Hour			PM Peak Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
Mapleview Dr./ Park Place Blvd. *Mitigation* *Signalized*	EB	Dual Left	E	57	0.50	F	81	0.91
		Triple Thru	A	4	0.48	C	26	0.91
		Right	A	7	0.02	A	5	0.04
	WB	Left	A	8	0.08	D	36	0.50
		Triple Thru	B	14	0.89	E	72	1.07
		Right	A	1	0.06	B	15	0.27
	NB	Dual Left	D	48	0.48	D	55	0.83
		Thru/Right	D	45	0.09	D	41	0.19
	SB	Left	D	54	0.34	E	70	0.82
		Thru	D	51	0.12	D	48	0.17
		Right (Overlap)	C	33	0.11	E	75	0.95
	Overall Intersection		***B***	***16***	***0.72***	***D***	***52***	***0.96***
Mapleview Dr./ Bayview Dr. *Signalized*	EB	Dual Left	F	80	0.88	E	76	0.90
		Triple Thru	B	15	0.40	B	20	0.54
		Right	B	17	0.20	C	23	0.11
	WB	Left	C	21	0.21	C	26	0.27
		Dual Thru-Thru/Right	E	56	0.99	D	46	0.86
	NB	Dual Left	E	55	0.58	F	85	0.87
		Thru-Thru/Right	C	33	0.05	D	48	0.43
	SB	Left	D	39	0.79	E	68	0.93
		Dual Thru	C	31	0.20	D	40	0.20
		Right (Channelized)	E	58	0.88	E	73	0.90
	Overall Intersection		***D***	***45***	***0.95***	***D***	***48***	***0.92***
Bayview Dr./ South Village Way *Signalized*	EB	Left/Thru-Thru/Right	D	44	0.05	D	47	0.53
	WB	Left	D	40	0.17	D	37	0.20
		Thru/Right	D	39	0.00	D	36	0.01
	NB	Left	A	4	0.17	A	8	0.32
		Thru-Thru/Right	A	6	0.21	A	9	0.40
	SB	Left	A	5	0.01	A	8	0.03
		Thru-Thru/Right	A	9	0.47	B	14	0.53
	Overall Intersection		***A***	***10***	***0.43***	***B***	***16***	***0.50***
Bayview Dr./ North Village Way *Signalized*	EB	Left	D	40	0.18	D	40	0.54
		Thru	A	< 1	0.00	C	34	0.00
		Right	D	45	0.03	C	35	0.08
	WB	Left	E	55	0.24	A	< 1	0.00
		Thru/Right	A	< 1	0.00	D	49	0.00
	NB	Left	A	4	0.13	A	7	0.28
		Thru-Thru/Right	A	5	0.20	A	7	0.39
	SB	Left	A	4	0.01	A	< 1	0.00
		Thru-Thru/Right	A	8	0.45	B	13	0.55
	Overall Intersection		***A***	***8***	***0.43***	***B***	***13***	***0.57***

Intersection	Approach/Movement		AM Peak Hour			PM Peak Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
Bayview Dr./ Concert Way- Churchill Dr. *Signalized*	EB	Left	D	41	0.21	D	37	0.26
		Thru	A	< 1	0.00	D	41	0.07
		Right	D	44	0.01	D	41	0.04
	WB	Left	D	36	0.15	D	36	0.19
		Thru/Right	D	42	0.14	D	41	0.04
	NB	Left	A	8	0.15	B	16	0.23
		Thru-Thru/Right	A	10	0.21	C	23	0.57
	SB	Left	A	6	0.12	B	16	0.32
		Thru-Thru/Right	B	12	0.50	C	24	0.65
	Overall Intersection		***B***	***16***	***0.42***	***C***	***25***	***0.50***
Bayview Dr./Coca Cola D/W- Industrial D/W South *Unsignalized*	EB	Left/Thru/Right	C	17	0.03	C	19	0.12
	WB	Left/Thru/Right	C	15	0.05	C	19	0.30
	NB	Left	B	10	0.01	B	10	0.01
		Thru-Thru/Right	Unopposed Movement			Unopposed Movement		
	SB	Left	A	9	0.01	A	10	0.01
		Thru-Thru/Right	Unopposed Movement			Unopposed Movement		
Bayview Dr./ Medical Centre South D/W – Industrial D/W North *Unsignalized*	EB	Left	C	19	0.09	C	22	0.34
		Right	B	12	0.05	B	11	0.16
	NB	Left	B	11	0.15	A	10	0.05
		Dual Thru	Unopposed Movement			Unopposed Movement		
	SB	Thru-Thru/Right	Unopposed Movement			Unopposed Movement		
Bayview Dr./Medical Centre North D/W *Unsignalized*	EB	Left/Right	B	15	0.04	B	14	0.14
	NB	Left	B	10	0.04	A	9	0.01
		Dual Thru	Unopposed Movement			Unopposed Movement		
	SB	Thru-Thru/Right	Unopposed Movement			Unopposed Movement		
Bayview Dr./ Big Bay Point Road *Signalized*	EB	Left	C	24	0.39	C	32	0.71
		Dual Thru	C	34	0.60	D	43	0.80
		Right	C	34	0.55	C	32	0.27
	WB	Left	C	30	0.83	D	49	0.87
		Dual Thru	C	24	0.45	C	34	0.51
		Right	B	21	0.22	C	31	0.25
	NB	Left	C	27	0.30	C	43	0.88
		Thru-Thru/Right	C	34	0.37	D	40	0.69
	SB	Left	C	28	0.17	D	36	0.62
		Dual Thru	C	34	0.27	D	43	0.48
		Right	C	35	0.25	D	39	0.16
	Overall Intersection		***C***	***30***	***0.67***	***D***	***39***	***0.91***

Intersection	Approach/Movement		AM Peak Hour			PM Peak Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
Bryne Dr./ Harvie Road *Signalized*	EB	Left	B	18	0.02	C	23	0.03
		Dual Thru	C	22	0.35	C	30	0.51
		Right	B	18	0.01	C	24	0.00
	WB	Left	C	22	0.24	D	38	0.53
		Dual Thru	C	20	0.23	C	30	0.51
		Right	B	19	0.10	C	23	0.03
	NB	Left	B	19	0.03	B	15	0.11
		Dual Thru	B	19	0.07	B	16	0.20
		Right	B	19	0.07	B	16	0.16
	SB	Left	C	22	0.24	C	29	0.67
		Dual Thru	C	20	0.17	B	16	0.19
		Right	B	19	0.06	B	15	0.06
	Overall Intersection		***C***	***21***	***0.30***	***C***	***25***	***0.61***

5.2.3 Queue Analysis – 2031 Background

Table 5.6 presents the results for the 95th and 50th percentile queue lengths. The individual movements where the 95th and 50th percentile queue lengths exceed the available storage lane lengths are highlighted in yellow and red, respectively.

The queue analysis showed that there are relatively minor deficiencies during both the AM or PM peak hour where either the 95th or 50th percentile queues could occasionally and temporarily exceed the available storage lane lengths. In comparison to the 2026 analysis, there are a similar number of storage lane deficiencies but the 95th and 50th percentile queues are generally shorter. This is presumed to be related to the redistribution of traffic facilitated by the road network improvements in the City's 2031 Emme model.

For the intersections where mitigation was proposed to address operational issues, i.e. for the southbound right turn at Mapleview Drive/Park Place Boulevard-Costco Access and the southbound left turn at Mapleview Drive/Bayview Drive, queues are shorter, and any remaining deficiencies are minor. As noted previously, there are physical constraints to increasing storage lane lengths in most cases.

With regard to the Highway 400 ramp terminals with the DDI design, the 95th and 50th percentile queues for either the northbound or southbound off ramps are well within the available total ramp storage lengths.

With regard to the Highway 400 ramp terminals under the existing Diamond Configurations, the 95th and 50th percentile queues for both the northbound and southbound off ramps are shorter. Again, this is presumed to be related to the redistribution of traffic facilitated by the road network improvements in the City's 2031 Emme model.

For the Mapleview Drive/Highway 400 Northbound Off/On Ramps intersection under the Diamond Configuration, the 95th and 50th percentile queues for the northbound off ramp are well within the available total ramp storage lengths for both the AM and PM peak hours.

For the Mapleview Drive/Highway 400 Southbound Off/On Ramps intersections under the Diamond Configuration, the 95th and 50th percentile queues for the southbound ramp are well within the available total ramp storage lengths for both the AM and PM peak hours.

TABLE 5.6: QUEUES – 2031 BACKGROUND

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Mapleview Dr./ Bryne Dr. *Signalized*	EB	Left	40 TWLTL	16	24	7	33	35	5	17	23
		Dual Thru-Thru/Right	260	83	177	59	201	86	174	58	202
	WB	Left	40 TWLTL	36	4	31	9	52	-12	32	8
		Dual Thru-Thru/Right	160	88	72	52	108	31	129	9	151
	NB	Left	65	40	25	22	43	33	32	18	47
		Thru-Thru/Right	100	15	85	6	94	73	27	40	60
	SB	Left	40 TWLTL	20	20	8	32	26	14	12	28
		Thru-Thru/Right	330	29	301	15	315	18	312	7	323
Mapleview Dr./ Barrie View Dr. *Signalized*	EB	Left	80 TWLTL	16	64	7	73	40	40	14	66
		Triple Thru-Thru/Right	160	56	104	24	136	89	71	56	104
	WB	Dual Left	65	55	10	38	27	56	9	38	27
		Dual Thru-Thru/Right	100	75	25	47	53	69	31	36	64
	NB	Left	35	6	29	1	34	25	10	12	23
		Thru	50	6	44	1	49	33	17	19	31
		Right	50	31	19	18	32	104	-54	70	-20
	SB	Left	35	55	-20	41	-6	53	-18	46	-11
		Thru-Thru/Right	290	108	182	42	248	204	86	103	187

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Mapleview Dr./ HWY 400 SB Off/On Ramp *Signalized*	EB	Quad Thru	100	123	-23	75	25	122	-22	71	29
		Right	55	35	20	12	43	50	5	12	43
	WB	Left	130	119	11	63	67	110	20	64	66
		Triple Thru	165	82	83	44	121	66	99	49	116
	SB	Dual Left	530	337	193	213	317	397	133	294	236
		Dual Right	530	263	267	103	427	398	132	172	358
Mapleview Dr./ HWY 400 NB Off/On Ramp *Signalized*	EB	Dual Left	135	43	92	24	111	118	17	71	64
		Triple Thru	165	86	79	26	139	110	55	47	118
	WB	Triple Thru	205	70	135	38	167	107	98	67	138
		Right	150	75	75	43	107	162	-12	108	42
	NB	Dual Left	560	69	491	43	517	74	486	50	510
		Dual Right	560	47	513	24	536	90	470	63	497
Mapleview Dr./ HWY 400 NB Off/On Ramp *Mitigation* *Signalized*	EB	Dual Left	135	54	81	26	109	77	58	47	88
		Triple Thru	165	59	106	22	143	88	77	31	134
	WB	Triple Thru	205	100	105	46	159	104	101	72	133
		Right (Channel-Yield)	150	21	129	4	146	76	74	43	107
	NB	Dual Left	560	67	493	42	518	76	484	50	510
		Dual Right	560	44	516	24	536	83	477	64	496
Mapleview Dr./ HWY 400 SB Off/On Ramp DDI *Signalized*	EB	Triple Thru	100	30	70	25	75	36	64	30	70
	WB	Triple Thru	165	52	113	39	126	50	115	46	119
	N-E Ramp		530	68	462	50	480	65	465	55	475
	N-W Ramp		530	67	463	54	476	47	483	29	501
Mapleview Dr./ HWY 400 NB Off/On Ramp DDI *Signalized*	EB	Triple Thru	165	64	101	58	107	66	99	59	106
	WB	Triple Thru	205	44	161	37	168	44	161	37	168
	S-E Ramp		560	47	513	26	534	72	488	53	507
	S-W Ramp		560	65	495	44	516	70	490	54	506

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Mapleview Dr./ Park Place Blvd. *Signalized*	EB	Dual Left	165	59	106	41	124	119	46	77	88
		Triple Thru	205	54	151	34	171	129	76	79	126
		Right	185	10	175	3	182	12	173	5	180
	WB	Left	60	17	43	4	56	42	18	15	45
		Triple Thru	125	137	-12	89	36	156	-31	124	1
		Right	125	110	15	27	98	215	-90	106	19
	NB	Dual Left	65	45	20	25	40	151	-86	131	-66
		Thru/Right	65	14	51	5	60	171	-106	75	-10
	SB	Left	65	17	48	7	58	72	-7	43	22
		Thru	85	7	78	2	83	125	-40	52	33
		Right	85	47	38	24	61	101	-16	101	-16
Mapleview Dr./ Park Place Blvd. *Mitigation* *Signalized*	EB	Dual Left	165	53	112	38	127	74	91	53	112
		Triple Thru	205	52	153	33	172	125	80	79	126
		Right	185	9	176	2	183	11	174	4	181
	WB	Left	60	13	47	3	57	38	22	14	46
		Triple Thru	125	120	5	80	45	153	-28	115	10
		Right	125	70	55	15	110	191	-66	77	48
	NB	Dual Left	65	40	25	23	42	157	-92	118	-53
		Thru/Right	65	18	47	8	57	138	-73	51	14
	SB	Left	65	15	50	6	59	79	-14	59	6
		Thru	85	8	77	3	82	133	-48	63	22
		Right (Overlap)	85	40	45	23	62	119	-34	95	-10

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Mapleview Dr./ Bayview Dr. *Signalized*	EB	Dual Left	80	62	18	41	39	92	-12	69	11
		Triple Thru	125	32	93	17	108	89	36	41	84
		Right	45	37	8	19	26	27	18	13	32
	WB	Left	125	71	54	17	108	18	107	6	119
		Dual Thru-Thru/Right	705	301	404	252	453	290	415	252	453
	NB	Dual Left	150	44	106	21	129	87	63	49	101
		Thru-Thru/Right	80	13	67	5	75	56	24	31	49
	SB	Left	100	137	-37	112	-12	138	-38	110	-10
		Dual Thru	210	294	-84	170	40	284	-74	145	65
		Right (Channelized)	65	88	-23	42	23	100	-35	59	6
Bayview Dr./ South Village Way *Signalized*	EB	Left/Thru-Thru/Right	65	21	44	10	55	48	17	29	36
	WB	Left	50	22	28	7	43	21	29	8	42
		Thru/Right	50	8	42	2	48	11	39	3	47
	NB	Left	45	26	19	11	34	42	3	18	27
		Thru-Thru/Right	210	38	172	16	194	79	131	36	174
	SB	Left	40	30	10	5	35	25	15	5	35
		Thru-Thru/Right	185	222	-37	96	89	147	38	77	108

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Bayview Dr./ North Village Way *Signalized*	EB	Left	45	21	24	10	35	40	5	24	21
		Thru	85	0	85	0	85	17	68	2	83
		Right	45	30	15	11	34	33	12	18	27
	WB	Left	60	5	55	1	59	0	60	0	60
		Thru/Right	60	0	60	0	60	3	57	1	59
	NB	Left	50	16	34	9	41	21	29	10	40
		Thru-Thru/Right	185	29	156	9	176	49	136	20	165
	SB	Left	55	4	51	1	54	0	55	0	55
		Thru-Thru/Right	235	169	66	58	177	107	128	55	180
Bayview Dr./ Concert Way-Churchill Dr. *Signalized*	EB	Left	85	17	68	7	78	32	53	17	68
		Thru	130	0	130	0	130	16	114	6	124
		Right	85	12	73	5	80	18	67	9	76
	WB	Left	35	18	17	7	28	27	8	13	22
		Thru/Right	650	33	617	20	630	13	637	5	645
	NB	Left	50	26	24	9	41	40	10	12	38
		Thru-Thru/Right	235	29	206	11	224	88	147	56	179
	SB	Left	45	37	8	12	33	38	7	16	29
		Thru-Thru/Right	200	110	90	43	157	102	98	73	127
Bayview Dr./Coca Cola D/W – Industrial D/W South *Unsignalized*	EB	Left/Thru/Right	100	9	91	3	97	19	81	9	91
	WB	Left/Thru/Right	100	22	78	7	93	44	56	22	78
	NB	Left	50	5	45	1	49	5	45	1	49
		Thru-Thru/Right	-	Unopposed Movement				Unopposed Movement			
	SB	Left	50	8	42	2	48	5	45	1	49
		Thru-Thru/Right	-	Unopposed Movement				Unopposed Movement			

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Bayview Dr./ Medical Centre South D/W – Industrial D/W North *Unsignalized*	EB	Left	35	16	19	7	28	69	-34	30	5
		Right	35	12	23	5	30	36	-1	14	21
	NB	Left	35	19	16	11	24	15	20	5	30
		Dual Thru	200	Unopposed Movement				Unopposed Movement			
	SB	Thru-Thru/Right	100	Unopposed Movement				Unopposed Movement			
Bayview Dr./Medical Centre North D/W *Unsignalized*	EB	Left/Right	100	12	88	4	96	127	-27	56	44
	NB	Left	25	12	13	4	21	9	16	2	23
		Dual Thru	130	Unopposed Movement				Unopposed Movement			
	SB	Thru-Thru/Right	90	Unopposed Movement				Unopposed Movement			
Bayview Dr./ Big Bay Point Road *Signalized*	EB	Left	40	50	-10	24	16	92	-52	65	-25
		Dual Thru	300	91	209	56	244	191	109	116	184
		Right	50	73	-23	40	10	94	-44	48	2
	WB	Left	50	86	-36	54	-4	91	-41	56	-6
		Dual Thru	745	85	660	48	697	107	638	61	684
		Right	50	43	7	18	32	36	14	17	33
	NB	Left	50	42	8	23	27	108	-58	84	-34
		Thru-Thru/Right	200	66	134	41	159	127	73	92	108
	SB	Left	65	22	43	10	55	56	9	39	26
		Dual Thru	650	49	601	27	623	57	593	40	610
		Right		63	2	36	29	43	22	25	40

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Bryne Dr./ Harvie Road *Signalized*	EB	Left	60	7	53	2	58	6	54	1	59
		Dual Thru	300	63	237	41	259	82	218	57	243
		Right	60	8	52	2	58	5	55	1	59
	WB	Left	60	31	29	16	44	64	-4	32	28
		Dual Thru	300	42	258	24	276	64	236	44	256
		Right	60	24	36	12	48	14	46	5	55
	NB	Left	60	11	49	4	56	23	37	11	49
		Dual Thru	300	24	276	12	288	45	255	28	272
		Right	60	16	44	7	53	25	35	12	48
	SB	Left	60	40	20	23	37	92	-32	65	-5
		Dual Thru	300	40	260	25	275	170	130	74	226
		Right	60	13	47	6	54	16	44	7	53

5.2.4 Capacity Analysis – 2031 Total

Table 5.7 presents the results of the analysis of AM and PM peak hour total traffic operations. V/C ratios greater than the MTO criteria are highlighted. **Appendix G** contains the Synchro analysis reports.

In terms of the net impact of the proposed Park Place North Lands industrial development, there are relatively minor increases in v/c ratios at most intersections in the study area.

As in the assessment of 2031 background traffic conditions, the intersection of Mapleview Drive/Park Place Boulevard-Costco Access would require a relatively minor improvement. Similarly, the Mapleview Drive/Highway 400 Northbound Off-On Ramp intersection requires a minor mitigation measure (channelized/yield westbound movement) under the 2031 traffic conditions.

The analysis for the two noted intersections was conducted without improvement measures to represent a *"do nothing"* condition and with the same potential improvements considered in the previous analyses. The results with mitigation measures in place are shown in the next row of the table.

The intersections where mitigation has been considered are as follows:

Mapleview Drive/Park Place Boulevard-Costco Access

- The initial analysis showed that this intersection would be over capacity and several movements would have v/c ratios above the 0.85 criteria or over capacity during the PM peak hour;
- The key problem movement is the southbound right turn from Park Place Boulevard to Mapleview Drive. It is noted the proposed development does not contribute any traffic to this movement;
- The mitigation considered is to implement a right turn overlap phase that would run concurrently with the non-conflicting eastbound and westbound advanced left turn phases;
- The improvement results in the intersection operating at capacity, with less delay, and the southbound right turn movement operating with improved conditions; and
- As noted previously, it is our understanding City staff intend to carry out a "Multi-Modal Level of Service/Traffic Study" for the Mapleview Drive corridor. Again, this will allow additional improvement alternatives to be examined for this intersection that would assist in addressing shorter and longer term

operational concerns while complementing other proposed improvements to the east and west of this intersection.

Mapleview Drive/Highway 400 Northbound Off/On Ramps

- The key problem movement is the westbound right turn from Mapleview Drive to Highway 400 northbound as the initial analysis reports the movement would be at capacity (v/c of 1.00);
- With a channelized right turn design as previously described, the intersection operation would be within capacity (v/c of 0.86) and at a good level of service (C). It is re-stated that the implementation of this type of improvement would likely represent a throw-away cost related to the eventual future implementation of the MTO-recommended DDI design; and
- It is also re-stated that as noted we understand City staff intend to carry out a “Multi-Modal Level of Service/Traffic Study” for the Mapleview Drive corridor. This will provide a focused opportunity to assess additional alternatives for shorter term operational and design solutions for the Mapleview Drive/ Highway 400 Northbound Off/On Ramps intersection and to consider ways to avoid throw-away costs in light of the longer term solution of the MTO-recommended DDI.

The analysis of 2031 total traffic conditions are similar to background traffic conditions, the Bayview Drive study area intersections operate within capacity and at good levels of service (D or better).

The Bayview Drive/Big Bay Point Road intersection would operate at acceptable levels of service and within capacity.

The Bryne Drive/Harvie Road intersection is forecast to operate well within capacity and at a good level of service under both the AM and PM peak hours.

The analysis results for the DDI show that the two ramp terminal intersections would operate at a very good level of service (C or better) in the AM and PM peak hours and well within capacity. These operational measures apply primarily to the through movements since as previously noted, left and right turns from Mapleview Drive to the Highway 400 on ramps operate as free flow although motorists making left turns could experience delay in the through lanes prior to reaching the taper section at the ramps. The exiting movements from the Highway 400 off ramps would operate at very good levels of service (C or better) and well within capacity.

It should be understood, however, that the improved operations at the interchange will not likely carry over to the adjacent Mapleview Drive intersections during the busiest conditions. The traffic reporting that was part of the MTO 2017 Transportation Environmental Study Report concluded that the PM peak hour traffic operations of adjacent intersections would be independent of the configuration of the interchange – i.e. the implementation of the DDI neither improves nor worsens the traffic operations at other intersections in the study area section of the Mapleview Drive corridor, it only improves ramp terminal operations.

TABLE 5.7: OPERATIONAL ANALYSIS – 2031 TOTAL

Intersection	Approach/Movement		AM Peak Hour			PM Peak Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
Mapleview Dr./ Bryne Dr. *Signalized*	EB	Left	B	15	0.17	A	9	0.37
		Dual Thru-Thru/Right	C	25	0.61	B	16	0.47
	WB	Left	E	57	0.76	D	41	0.57
		Dual Thru-Thru/Right	A	6	0.43	A	2	0.42
	NB	Left	D	42	0.46	D	50	0.44
		Thru-Thru/Right	D	44	0.06	E	57	0.44
	SB	Left	D	42	0.16	D	53	0.34
		Thru-Thru/Right	D	46	0.21	E	56	0.10
	Overall Intersection		***C***	***23***	***0.74***	***B***	***18***	***0.57***
Mapleview Dr./ Barrie View Dr. *Signalized*	EB	Left	B	11	0.21	C	22	0.34
		Triple Thru-Thru/Right	A	5	0.45	B	19	0.58
	WB	Dual Left	E	59	0.69	E	73	0.76
		Dual Thru-Thru/Right	A	8	0.71	A	10	0.67
	NB	Left	D	45	0.04	D	46	0.22
		Thru	D	46	0.02	D	50	0.32
		Right	D	47	0.10	E	65	0.74
	SB	Left	D	44	0.73	D	44	0.72
		Thru-Thru/Right	D	35	0.04	D	38	0.03
	Overall Intersection		***B***	***16***	***0.76***	***C***	***27***	***0.74***
Mapleview Dr./ HWY 400 SB Off/On Ramp *Signalized*	EB	Quad Thru	C	21	0.70	C	25	0.82
		Right	A	6	0.20	A	9	0.21
	WB	Left	D	47	0.95	D	41	0.93
		Triple Thru	A	9	0.56	A	10	0.54
	SB	Dual Left	D	37	0.69	D	55	0.83
		Dual Right	D	44	0.83	D	42	0.35
	Overall Intersection		***C***	***24***	***0.94***	***C***	***25***	***0.93***
Mapleview Dr./ HWY 400 NB Off/On Ramp *Signalized*	EB	Dual Left	D	36	0.67	D	51	0.95
		Triple Thru	A	8	0.51	B	17	0.59
	WB	Triple Thru	A	5	0.64	C	21	0.79
		Right	D	41	0.52	D	42	1.00
	NB	Dual Left	D	47	0.74	D	49	0.65
		Dual Right	D	40	0.37	E	74	0.94
	Overall Intersection		***B***	***18***	***0.66***	***C***	***32***	***0.97***

Intersection	Approach/Movement		AM Peak Hour			PM Peak Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
Mapleview Dr./ HWY 400 NB Off/On Ramp *Mitigation* *Signalized*	EB	Dual Left	D	36	0.67	D	40	0.88
		Triple Thru	A	8	0.51	B	12	0.60
	WB	Triple Thru	A	5	0.64	C	21	0.83
		Right (Channel/Yield)	A	1	0.50	A	1	0.66
	NB	Dual Left	D	47	0.74	D	48	0.63
		Dual Right	D	40	0.37	E	69	0.92
	Overall Intersection		***B***	***12***	***0.66***	***C***	***23***	***0.86***
Mapleview Dr./ HWY 400 West Terminal *DDI* *Signalized*	EB	Triple Through	C	31	0.75	C	34	0.86
	WB	Triple Through	B	10	0.66	C	24	0.84
	Overall Intersection		***B***	***20***	***0.70***	***C***	***29***	***0.85***
	W-S Ramp (Right)		A	< 1	0.11	A	< 1	0.11
	E-S Ramp (Left)		A	6	0.27	A	6	0.28
	N-W Ramp (Dual Right)		C	26	0.58	B	20	0.20
	N-E Ramp (Dual Left)		C	20	0.41	C	27	0.44
Mapleview Dr./ HWY 400 East Terminal *DDI* *Signalized*	EB	Triple Through	B	19	0.83	C	25	0.89
	WB	Triple Through	C	26	0.72	C	34	0.81
	Overall Intersection		***C***	***22***	***0.77***	***C***	***30***	***0.85***
	W-N Ramp (Left)		A	5	0.19	A	7	0.40
	E-N Ramp (Right)		A	< 1	0.44	A	< 1	0.61
	S-E Ramp (Dual Right)		B	19	0.20	C	27	0.48
	S-W Ramp (Dual Left)		B	19	0.30	C	22	0.29
Mapleview Dr./ Park Place Blvd. *Signalized*	EB	Dual Left	E	60	0.50	F	230	1.33
		Triple Thru	A	4	0.51	D	38	1.00
		Right	A	9	0.02	A	7	0.04
	WB	Left	A	9	0.09	D	37	0.49
		Triple Thru	C	23	0.98	E	76	1.09
		Right	A	1	0.07	B	16	0.30
	NB	Dual Left	D	48	0.48	D	55	0.83
		Thru/Right	D	45	0.09	D	41	0.19
	SB	Left	D	49	0.29	E	59	0.75
		Thru	D	47	0.06	D	45	0.14
		Right	D	47	0.14	F	249	1.39
	Overall Intersection		***C***	***21***	***0.73***	***F***	***84***	***1.11***

Intersection	Approach/Movement		AM Peak Hour			PM Peak Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
Mapleview Dr./ Park Place Blvd. *Mitigation* *Signalized*	EB	Dual Left	E	59	0.50	F	123	1.08
		Triple Thru	A	4	0.49	C	27	0.93
		Right	A	8	0.02	A	5	0.04
	WB	Left	A	8	0.08	D	36	0.50
		Triple Thru	B	18	0.94	E	65	1.06
		Right	A	1	0.07	B	13	0.30
	NB	Dual Left	D	48	0.48	D	55	0.83
		Thru/Right	D	45	0.09	D	41	0.19
	SB	Left	D	52	0.38	F	83	0.90
		Thru	D	49	0.08	D	48	0.17
		Right (Overlap)	C	32	0.13	F	109	1.07
	Overall Intersection		***B***	***18***	***0.73***	***E***	***58***	***1.00***
Mapleview Dr./ Bayview Dr. *Signalized*	EB	Dual Left	F	86	0.92	E	77	0.92
		Triple Thru	B	16	0.41	B	19	0.56
		Right	B	17	0.20	C	20	0.11
	WB	Left	C	21	0.21	C	27	0.28
		Dual Thru-Thru/Right	E	56	0.99	D	50	0.90
	NB	Dual Left	E	55	0.58	F	83	0.86
		Thru-Thru/Right	C	33	0.04	D	46	0.40
	SB	Left	D	38	0.79	E	75	0.96
		Dual Thru	C	30	0.19	D	39	0.20
		Right (Channelized)	E	59	0.89	E	79	0.94
	Overall Intersection		***D***	***46***	***0.96***	***D***	***50***	***0.95***
Bayview Dr./ South Village Way *Signalized*	EB	Left/Thru-Thru/Right	D	45	0.14	D	47	0.56
	WB	Left	D	40	0.17	D	37	0.21
		Thru/Right	D	39	0.00	D	35	0.01
	NB	Left	A	4	0.18	A	9	0.36
		Thru-Thru/Right	A	6	0.21	A	10	0.41
	SB	Left	A	5	0.01	A	9	0.03
		Thru-Thru/Right	A	9	0.48	B	15	0.56
	Overall Intersection		***A***	***10***	***0.43***	***B***	***17***	***0.53***
Bayview Dr./ North Village Way *Signalized*	EB	Left	D	40	0.23	D	41	0.59
		Thru	A	< 1	0.00	C	34	0.00
		Right	D	46	0.03	C	35	0.08
	WB	Left	E	55	0.24	A	< 1	0.00
		Thru/Right	A	< 1	0.00	D	48	0.00
	NB	Left	A	4	0.12	A	8	0.31
		Thru-Thru/Right	A	5	0.20	A	7	0.39
	SB	Left	A	5	0.01	A	< 1	0.00
		Thru-Thru/Right	A	8	0.46	B	13	0.57
	Overall Intersection		***A***	***9***	***0.44***	***B***	***13***	***0.59***

Intersection	Approach/Movement		AM Peak Hour			PM Peak Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
Bayview Dr./ Concert Way- Churchill Dr. *Signalized*	EB	Left	D	37	0.26	D	37	0.28
		Thru	A	< 1	0.00	D	41	0.07
		Right	D	40	0.02	D	41	0.04
	WB	Left	D	39	0.17	D	36	0.19
		Thru/Right	D	43	0.14	D	41	0.04
	NB	Left	A	8	0.16	B	17	0.25
		Thru-Thru/Right	B	10	0.22	C	23	0.59
	SB	Left	A	7	0.13	B	17	0.33
		Thru-Thru/Right	B	13	0.51	C	25	0.68
	Overall Intersection		***B***	***16***	***0.45***	***C***	***25***	***0.52***
Bayview Dr./Coca Cola D/W- Industrial D/W South *Unsignalized*	EB	Left/Thru/Right	C	17	0.03	C	20	0.13
	WB	Left/Thru/Right	C	16	0.06	C	20	0.31
	NB	Left	B	10	0.01	B	10	0.01
		Thru-Thru/Right	Unopposed Movement			Unopposed Movement		
	SB	Left	A	9	0.01	A	10	0.01
		Thru-Thru/Right	Unopposed Movement			Unopposed Movement		
Bayview Dr./ Medical Centre South D/W – Industrial D/W North *Unsignalized*	EB	Left	C	19	0.09	C	23	0.35
		Right	B	12	0.05	B	11	0.16
	NB	Left	B	11	0.15	A	10	0.05
		Dual Thru	Unopposed Movement			Unopposed Movement		
	SB	Thru-Thru/Right	Unopposed Movement			Unopposed Movement		
Bayview Dr./Medical Centre North D/W *Unsignalized*	EB	Left/Right	B	15	0.04	B	15	0.14
	NB	Left	B	10	0.04	A	10	0.01
		Dual Thru	Unopposed Movement			Unopposed Movement		
	SB	Thru-Thru/Right	Unopposed Movement			Unopposed Movement		
Bayview Dr./ Big Bay Point Road *Signalized*	EB	Left	C	24	0.39	C	34	0.73
		Dual Thru	C	34	0.60	D	44	0.81
		Right	C	34	0.55	C	33	0.29
	WB	Left	C	30	0.83	E	63	0.93
		Dual Thru	C	24	0.45	C	34	0.50
		Right	B	21	0.22	C	31	0.25
	NB	Left	C	27	0.30	D	46	0.90
		Thru-Thru/Right	C	35	0.41	D	41	0.70
	SB	Left	C	28	0.17	D	37	0.63
		Dual Thru	C	34	0.27	D	45	0.52
		Right	C	35	0.25	D	40	0.16
	Overall Intersection		***C***	***30***	***0.69***	***D***	***41***	***0.97***

Intersection	Approach/Movement		AM Peak Hour			PM Peak Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
Bryne Dr./ Harvie Road *Signalized*	EB	Left	B	18	0.02	C	23	0.03
		Dual Thru	C	22	0.35	C	30	0.51
		Right	B	18	0.01	C	23	0.00
	WB	Left	C	22	0.24	D	39	0.54
		Dual Thru	C	20	0.23	C	30	0.52
		Right	B	19	0.10	C	23	0.03
	NB	Left	B	19	0.03	B	15	0.11
		Dual Thru	B	19	0.07	B	16	0.20
		Right	B	19	0.07	B	16	0.16
	SB	Left	C	22	0.24	C	29	0.67
		Dual Thru	C	20	0.17	B	16	0.19
		Right	B	19	0.06	B	15	0.06
	Overall Intersection		***C***	***21***	***0.30***	***C***	***25***	***0.61***

5.2.5 Queue Analysis – 2031 Total

Table 5.8 presents the results for the 95th and 50th percentile queue lengths. The individual movements where the 95th and 50th percentile queue lengths exceed the available storage lane lengths are highlighted in yellow and red, respectively.

The queue analysis showed that there are relatively minor deficiencies during both the AM or PM peak hour where either the 95th or 50th percentile queues could occasionally and temporarily exceed the available storage lane lengths. In comparison to 2031 background conditions, the reported queues under total traffic conditions are slightly exacerbated with the addition of the proposed industrial development on the North Lands. As noted previously, there are physical constraints to increasing storage lane lengths in most cases.

With regard to the Highway 400 ramp terminals with the DDI design, the 95th and 50th percentile queues for either the northbound or southbound off ramps are well within the available total storage lane lengths.

For the Mapleview Drive/Highway 400 Northbound Off/On Ramps intersection under the Diamond Configuration, the 95th and 50th percentile queues for the northbound off ramp are well within the available total ramp storage lengths for both the AM and PM peak hours.

For the Mapleview Drive/Highway 400 Southbound Off/On Ramps intersections under the Diamond Configuration, the 95th and 50th percentile queues for the southbound ramp are well within the available total ramp storage lengths for both the AM and PM peak hours.

TABLE 5.8: QUEUES – 2031 TOTAL

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Mapleview Dr./ Bryne Dr. *Signalized*	EB	Left	40 TWLTL	25	15	9	31	43	-3	19	21
		Dual Thru-Thru/Right	260	93	167	61	199	92	168	59	201
	WB	Left	40 TWLTL	36	4	31	9	81	-41	34	6
		Dual Thru-Thru/Right	160	97	63	54	106	53	107	8	152
	NB	Left	65	35	30	20	45	34	31	19	46
		Thru-Thru/Right	100	13	87	5	95	68	32	39	61
	SB	Left	40 TWLTL	19	21	8	32	25	15	12	28
		Thru-Thru/Right	330	29	301	16	314	16	314	6	324
Mapleview Dr./ Barrie View Dr. *Signalized*	EB	Left	80 TWLTL	23	57	8	72	62	18	20	60
		Triple Thru-Thru/Right	160	66	94	29	131	117	43	74	86
	WB	Dual Left	65	53	12	39	26	55	10	38	27
		Dual Thru-Thru/Right	100	75	25	48	52	75	25	39	61
	NB	Left	35	7	28	2	33	27	8	12	23
		Thru	50	7	43	1	49	39	11	21	29
		Right	50	35	15	19	31	102	-52	67	-17
	SB	Left	35	54	-19	40	-5	52	-17	46	-11
		Thru-Thru/Right	290	91	199	29	261	179	111	87	203

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Mapleview Dr./ HWY 400 SB Off/On Ramp *Signalized*	EB	Quad Thru	100	124	-24	75	25	136	-36	88	12
		Right	55	54	1	16	39	52	3	14	41
	WB	Left	130	108	22	57	73	124	6	67	63
		Triple Thru	165	72	93	42	123	68	97	45	120
	SB	Dual Left	530	270	260	158	372	411	119	299	231
		Dual Right	530	160	370	67	463	421	109	190	340
Mapleview Dr./ HWY 400 NB Off/On Ramp *Signalized*	EB	Dual Left	135	52	83	26	109	121	14	66	69
		Triple Thru	165	81	84	25	140	171	-6	79	86
	WB	Triple Thru	205	90	115	44	161	94	111	67	138
		Right	150	71	79	43	107	133	17	94	56
	NB	Dual Left	560	71	489	45	515	207	353	74	486
		Dual Right	560	43	517	24	536	230	330	98	462
Mapleview Dr./ HWY 400 NB Off/On Ramp *Mitigation* *Signalized*	EB	Dual Left	135	63	72	27	108	72	63	45	90
		Triple Thru	165	93	72	27	138	96	69	31	134
	WB	Triple Thru	205	74	131	39	166	127	78	82	123
		Right (Channel-Yield)	150	20	130	4	146	77	73	43	107
	NB	Dual Left	560	69	491	42	518	72	488	47	513
		Dual Right	560	46	514	25	535	97	463	67	493
Mapleview Dr./ HWY 400 SB Off/On Ramp DDI *Signalized*	EB	Triple Thru	100	30	70	24	76	39	61	31	69
	WB	Triple Thru	165	53	112	40	125	50	115	46	119
	N-E Ramp		530	66	464	50	480	66	464	56	474
	N-W Ramp		530	67	463	54	476	47	483	28	502
Mapleview Dr./ HWY 400 NB Off/On Ramp DDI *Signalized*	EB	Triple Thru	165	64	101	58	107	66	99	59	106
	WB	Triple Thru	205	44	161	37	168	45	160	37	168
	S-E Ramp		560	46	514	26	534	76	484	54	506
	S-W Ramp		560	67	493	45	515	71	489	54	506

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Mapleview Dr./ Park Place Blvd. *Signalized*	EB	Dual Left	165	56	109	38	127	219	-54	140	25
		Triple Thru	205	58	147	36	169	243	-38	128	77
		Right	185	6	179	1	184	12	173	5	180
	WB	Left	60	13	47	3	57	43	17	16	44
		Triple Thru	125	138	-13	90	35	155	-30	116	9
		Right	125	109	16	29	96	195	-70	83	42
	NB	Dual Left	65	43	22	24	41	154	-89	126	-61
		Thru/Right	65	16	49	6	59	149	-84	59	6
	SB	Left	65	24	41	11	54	69	-4	43	22
		Thru	85	8	77	2	83	123	-38	50	35
		Right	85	46	39	26	59	101	-16	101	-16
Mapleview Dr./ Park Place Blvd. *Mitigation* *Signalized*	EB	Dual Left	165	53	112	37	128	91	74	62	103
		Triple Thru	205	51	154	32	173	116	89	73	132
		Right	185	9	176	2	183	11	174	4	181
	WB	Left	60	12	48	3	57	46	14	17	43
		Triple Thru	125	118	7	76	49	155	-30	114	11
		Right	125	61	64	14	111	173	-48	67	58
	NB	Dual Left	65	42	23	23	42	155	-90	120	-55
		Thru/Right	65	14	51	6	59	120	-55	42	23
	SB	Left	65	20	45	10	55	81	-16	63	2
		Thru	85	8	77	2	83	136	-51	88	-3
		Right (Overlap)	85	45	40	25	60	120	-35	93	-8

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Mapleview Dr./ Bayview Dr. *Signalized*	EB	Dual Left	80	64	16	43	37	96	-16	71	9
		Triple Thru	125	34	91	19	106	78	47	37	88
		Right	45	37	8	18	27	27	18	13	32
	WB	Left	125	50	75	12	113	17	108	6	119
		Dual Thru-Thru/Right	705	306	399	252	453	284	421	252	453
	NB	Dual Left	150	45	105	22	128	75	75	47	103
		Thru-Thru/Right	80	15	65	6	74	51	29	31	49
	SB	Left	100	135	-35	114	-14	137	-37	108	-8
		Dual Thru	210	285	-75	181	29	271	-61	132	78
		Right (Channelized)	65	91	-26	43	22	102	-37	60	5
Bayview Dr./ South Village Way *Signalized*	EB	Left/Thru-Thru/Right	65	33	32	12	53	52	13	33	32
	WB	Left	50	35	15	10	40	20	30	7	43
		Thru/Right	50	6	44	1	49	10	40	3	47
	NB	Left	45	26	19	12	33	31	14	16	29
		Thru-Thru/Right	210	35	175	12	198	73	137	34	176
	SB	Left	40	21	19	3	37	23	17	5	35
		Thru-Thru/Right	185	196	-11	83	102	180	5	94	91

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Bayview Dr./ North Village Way *Signalized*	EB	Left	45	21	24	10	35	41	4	25	20
		Thru	85	0	85	0	85	24	61	3	82
		Right	45	31	14	12	33	42	3	19	26
	WB	Left	60	9	51	2	58	0	60	0	60
		Thru/Right	60	0	60	0	60	3	57	1	59
	NB	Left	50	16	34	7	43	23	27	11	39
		Thru-Thru/Right	185	27	158	10	175	56	129	23	162
	SB	Left	55	31	24	4	51	0	55	0	55
		Thru-Thru/Right	235	208	27	69	166	248	-13	74	161
Bayview Dr./ Concert Way-Churchill Dr. *Signalized*	EB	Left	85	20	65	10	75	31	54	15	70
		Thru	130	0	130	0	130	16	114	6	124
		Right	85	13	72	5	80	17	68	9	76
	WB	Left	35	20	15	8	27	27	8	13	22
		Thru/Right	650	35	615	21	629	18	632	6	644
	NB	Left	50	26	24	9	41	34	16	12	38
		Thru-Thru/Right	235	34	201	12	223	96	139	61	174
	SB	Left	45	51	-6	16	29	46	-1	19	26
		Thru-Thru/Right	200	153	47	59	141	118	82	83	117
Bayview Dr./Coca Cola D/W – Industrial D/W South *Unsignalized*	EB	Left/Thru/Right	100	9	91	3	97	20	80	9	91
	WB	Left/Thru/Right	100	19	81	6	94	85	15	36	64
	NB	Left	50	6	44	1	49	5	45	1	49
		Thru-Thru/Right	-	Unopposed Movement				Unopposed Movement			
	SB	Left	50	8	42	2	48	4	46	1	49
		Thru-Thru/Right	-	Unopposed Movement				Unopposed Movement			

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Bayview Dr./ Medical Centre South D/W – Industrial D/W North *Unsignalized*	EB	Left	35	18	17	8	27	95	-60	46	-11
		Right	35	13	22	5	30	66	-31	21	14
	NB	Left	35	20	15	11	24	19	16	7	28
		Dual Thru	200	Unopposed Movement				Unopposed Movement			
	SB	Thru-Thru/Right	100	Unopposed Movement				Unopposed Movement			
Bayview Dr./Medical Centre North D/W *Unsignalized*	EB	Left/Right	100	12	88	4	96	132	-32	63	37
	NB	Left	25	12	13	4	21	11	14	2	23
		Dual Thru	130	Unopposed Movement				Unopposed Movement			
	SB	Thru-Thru/Right	90	Unopposed Movement				Unopposed Movement			
Bayview Dr./ Big Bay Point Road *Signalized*	EB	Left	40	62	-22	29	11	94	-54	63	-23
		Dual Thru	300	98	202	60	240	437	-137	199	101
		Right	50	83	-33	47	3	98	-48	54	-4
	WB	Left	50	93	-43	60	-10	106	-56	67	-17
		Dual Thru	745	79	666	47	698	193	552	88	657
		Right	50	28	22	15	35	49	1	20	30
	NB	Left	50	45	5	22	28	106	-56	86	-36
		Thru-Thru/Right	200	76	124	48	152	123	77	95	105
	SB	Left	65	24	41	11	54	96	-31	49	16
		Dual Thru	650	51	599	28	622	98	552	51	599
		Right		63	2	36	29	43	22	23	42

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Bryne Dr./ Harvie Road *Signalized*	EB	Left	60	9	51	2	58	14	46	2	58
		Dual Thru	300	60	240	40	260	82	218	58	242
		Right	60	8	52	2	58	5	55	1	59
	WB	Left	60	33	27	16	44	62	-2	31	29
		Dual Thru	300	44	256	26	274	74	226	46	254
		Right	60	23	37	12	48	23	37	6	54
	NB	Left	60	12	48	4	56	20	40	10	50
		Dual Thru	300	22	278	12	288	46	254	30	270
		Right	60	16	44	8	52	25	35	13	47
	SB	Left	60	38	22	23	37	92	-32	66	-6
		Dual Thru	300	47	253	28	272	153	147	65	235
		Right	60	13	47	6	54	18	42	8	52

5.2.6 Effect of TMP Road Network Improvements

In the discussion of the 2026 analysis results, the 2031 forecasts for the Harvie Road-Big Bay Point Road corridor show that it has reserve capacity to accommodate a significant amount of increased traffic diversion from the Mapleview Drive corridor. Based on the 2031 PM peak hour forecasts factored to a 24-hour volume, this corridor would have an estimated 23,500 vehicles per day. With a 30,000 vehicles per day threshold that typically represents capacity for four lane arterial roads, there would be reserve capacity in the Harvie Road-Big Bay Point Road corridor of approximately 7,000 vehicle per day (or 700 vehicles per hour) that could be used as needed by non-Park Place traffic and Park Place-generated traffic to further manage traffic flows in the Mapleview Drive corridor and maintain demands within capacity during peak periods.

5.3 2036 Horizon

5.3.1 Methodology

The 2036 traffic forecasts were analyzed using the same methodology and parameters as in the analysis of 2031 conditions.

Our analysis examines both the Diamond Interchange configuration and DDI configuration. This will provide insight on how the current Diamond Interchange configuration will operate in the event the DDI does not get implemented by 2031.

5.3.2 Capacity Analysis – 2036 Background

Table 5.9 presents the results of the analysis of AM and PM peak hour background traffic operations. V/C ratios greater than the MTO criteria are highlighted. **Appendix H** contains the Synchro analysis reports.

Similar to previous future horizon analyses over-capacity issues are noted at the Mapleview Drive intersections with the Highway 400 Northbound Off-On Ramp terminal and Park Place Boulevard.

Several parts of the Mapleview Drive corridor would continue to be operating close to capacity as evidenced by some intersections having volume demands at capacity or having individual movements with v/c ratios greater than the 0.85 criteria. Where the more significant capacity deficiencies are evident, possible improvements have been considered and the results with mitigation measures in place are shown in the next row of the table.

The intersections where mitigation has been considered are as follows:

Mapleview Drive/Highway 400 Northbound Off/On Ramps

- The key problem movement is the westbound right turn from Mapleview Drive to Highway 400 northbound the initial analysis reports the movement would be over-capacity (v/c of 1.03);
- With a channelized right turn design as previously described, the intersection operation would be within capacity (v/c of 0.87) and at a good level of service (C). It is re-stated that the implementation of this type of improvement would likely represent a throw-away cost related to the eventual future implementation of the MTO-recommended DDI design; and
- It is also re-stated that as noted previously in Section 4.3, City staff intend to carry out a “Multi-Modal Level of Service/Traffic Study” for the Mapleview Drive corridor in 2020. This will provide a focused opportunity to assess additional alternatives

for shorter term operational and design solutions for the Mapleview Drive/ Highway 400 Northbound Off/On Ramps intersection and to consider ways to avoid throw-away costs in light of the longer term solution of the MTO-recommended DDI.

Mapleview Drive/Park Place Boulevard-Costco Access

- The initial analysis showed that this intersection would be at capacity (v/c of 1.09) and several movements would have v/c ratios exceeding the theoretical capacity during the PM peak hour;
- Consistent with the previous horizons, the key problem movement is the southbound right turn from Park Place Boulevard to Mapleview Drive (v/c of 1.31);
- Also consistent with the previous horizons, the mitigation considered is to implement a right turn overlap phase that would run concurrently with the non-conflicting eastbound and westbound advanced left turn phases;
- The improvement results in the intersection operating within capacity (v/c of 0.99) and with less delay, a better level of service (E versus F), and the southbound right turn movement operating within capacity (v/c of 0.98), albeit near capacity; and
- As noted previously, City staff intend to carry out a “Multi-Modal Level of Service/Traffic Study” for the Mapleview Drive corridor. Again, this will allow additional improvement alternatives to be examined for this intersection that would assist in addressing shorter and longer term operational concerns while complementing other proposed improvements to the east and west of this intersection.

The intersection of Mapleview Drive/Bayview Drive forecasts the westbound shared through/right movement as operating slightly over-capacity (v/c = 1.08) under the AM peak hour. The forecast volume of westbound right turn movements would warrant the consideration of an auxiliary turn lane; however, as previously mentioned the intersection is physically built-out. It is anticipated that this issue will be examined as part of the Mapleview Drive corridor study.

Consistent with the analysis of previous horizon year conditions, the Bayview Drive study area intersections operate within capacity and at good levels of service (D or better).

The Bayview Drive/Big Bay Point Road intersection is forecast to operate well within capacity and at a good level of service under both the AM and PM peak hours.

The Bryne Drive/Harvie Road intersection is forecast to operate well within capacity and at a good level of service under both the AM and PM peak hours.

The analysis results for the DDI show that the two ramp terminal intersections would operate at a very good level of service (C or better) in the AM and PM peak hours and well within capacity. It is noted that while within capacity movements are noted to be slighty above the 0.85 criteria. These operational measures apply primarily to the through movements since as previously noted, left and right turns from Mapleview Drive to the Highway 400 on ramps operate as free flow although motorists making left turns could experience delay in the through lanes prior to reaching the taper section at the ramps. The exiting movements from the Highway 400 off ramps would operate at very good levels of service (C or better) and well within capacity.

It should be understood, however, that the improved operations at the interchange will not likely carry over to the adjacent Mapleview Drive intersections during the busiest conditions. The traffic reporting that was part of the MTO 2017 Transportation Environmental Study Report concluded that the PM peak hour traffic operations of adjacent intersections would be independent of the configuration of the interchange – i.e. the implementation of the DDI neither improves nor worsens the traffic operations at other intersections in the study area section of the Mapleview Drive corridor, it only improves ramp terminal operations.

TABLE 5.9: OPERATIONAL ANALYSIS – 2036 BACKGROUND

Intersection	Approach/Movement		AM Peak Hour			PM Peak Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
Mapleview Dr./ Bryne Dr. *Signalized*	EB	Left	B	18	0.20	A	10	0.39
		Dual Thru-Thru/Right	C	29	0.69	B	16	0.48
	WB	Left	E	60	0.80	D	42	0.60
		Dual Thru-Thru/Right	A	7	0.46	A	2	0.43
	NB	Left	D	38	0.42	D	50	0.46
		Thru-Thru/Right	D	42	0.06	E	57	0.46
	SB	Left	D	41	0.16	D	53	0.35
		Thru-Thru/Right	D	45	0.21	E	56	0.10
	Overall Intersection		***C***	***25***	***0.75***	***B***	***19***	***0.60***
Mapleview Dr./ Barrie View Dr. *Signalized*	EB	Left	B	12	0.21	C	25	0.37
		Triple Thru-Thru/Right	A	5	0.48	B	20	0.61
	WB	Dual Left	E	58	0.70	E	72	0.78
		Dual Thru-Thru/Right	A	9	0.74	B	11	0.70
	NB	Left	D	45	0.04	D	44	0.21
		Thru	D	46	0.02	D	49	0.31
		Right	D	46	0.10	E	67	0.79
	SB	Left	D	45	0.76	D	45	0.75
		Thru-Thru/Right	C	35	0.04	D	37	0.03
	Overall Intersection		***B***	***16***	***0.79***	***C***	***28***	***0.77***
Mapleview Dr./ HWY 400 SB Off/On Ramp *Signalized*	EB	Quad Thru	C	22	0.75	C	27	0.87
		Right	A	7	0.22	A	9	0.23
	WB	Left	D	46	0.95	D	41	0.95
		Triple Thru	A	9	0.58	B	10	0.56
	SB	Dual Left	D	37	0.69	E	55	0.84
		Dual Right	D	46	0.85	D	42	0.36
	Overall Intersection		***C***	***24***	***0.94***	***C***	***26***	***0.94***
Mapleview Dr./ HWY 400 NB Off/On Ramp *Signalized*	EB	Dual Left	D	36	0.70	D	51	0.97
		Triple Thru	A	8	0.53	B	15	0.61
	WB	Triple Thru	A	9	0.66	C	21	0.81
		Right	D	46	0.55	D	54	1.03
	NB	Dual Left	D	47	0.74	D	50	0.69
		Dual Right	D	39	0.37	E	71	0.92
	Overall Intersection		***C***	***20***	***0.69***	***C***	***34***	***0.99***

Intersection	Approach/Movement		AM Peak Hour			PM Peak Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
Mapleview Dr./ HWY 400 NB Off/On Ramp *Mitigation* *Signalized*	EB	Dual Left	D	36	0.70	D	39	0.90
		Triple Thru	A	8	0.53	B	12	0.61
	WB	Triple Thru	A	19	0.66	C	20	0.84
		Right (Channel/Yield)	A	1	0.52	A	1	0.67
	NB	Dual Left	D	47	0.74	D	50	0.69
		Dual Right	D	39	0.37	E	71	0.92
	Overall Intersection		***B***	***14***	***0.69***	***C***	***22***	***0.87***
Mapleview Dr./ HWY 400 West Terminal *DDI* *Signalized*	EB	Triple Through	C	31	0.76	C	35	0.88
	WB	Triple Through	B	11	0.69	C	26	0.86
	Overall Intersection		***C***	***20***	***0.72***	***C***	***31***	***0.87***
	W-S Ramp (Right)		A	< 1	0.12	A	< 1	0.11
	E-S Ramp (Left)		A	6	0.28	A	6	0.29
	N-W Ramp (Dual Right)		C	27	0.61	C	20	0.21
	N-E Ramp (Dual Left)		C	21	0.43	C	27	0.46
Mapleview Dr./ HWY 400 East Terminal *DDI* *Signalized*	EB	Triple Through	B	19	0.83	C	25	0.90
	WB	Triple Through	C	28	0.76	D	36	0.84
	Overall Intersection		***C***	***23***	***0.79***	***C***	***31***	***0.87***
	W-N Ramp (Left)		A	5	0.20	A	7	0.42
	E-N Ramp (Right)		A	< 1	0.45	A	< 1	0.62
	S-E Ramp (Dual Right)		B	19	0.21	C	28	0.48
	S-W Ramp (Dual Left)		B	19	0.31	C	21	0.30
Mapleview Dr./ Park Place Blvd. *Signalized*	EB	Dual Left	E	64	0.54	F	175	1.19
		Triple Thru	A	3	0.53	D	49	1.04
		Right	A	9	0.02	A	6	0.04
	WB	Left	A	8	0.09	D	39	0.51
		Triple Thru	C	21	0.98	F	91	1.12
		Right	A	1	0.06	B	17	0.28
	NB	Dual Left	D	48	0.50	D	55	0.84
		Thru/Right	D	45	0.08	D	40	0.19
	SB	Left	D	48	0.19	E	58	0.71
		Thru	D	47	0.07	D	45	0.15
		Right	D	48	0.11	F	217	1.31
	Overall Intersection		***B***	***20***	***0.74***	***F***	***83***	***1.09***

Intersection	Approach/Movement		AM Peak Hour			PM Peak Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
Mapleview Dr./ Park Place Blvd. *Mitigation* *Signalized*	EB	Dual Left	E	63	0.51	F	83	0.91
		Triple Thru	A	2	0.50	C	28	0.95
		Right	A	7	0.02	A	6	0.04
	WB	Left	A	7	0.08	D	38	0.51
		Triple Thru	B	15	0.93	F	84	1.11
		Right	A	1	0.06	B	16	0.28
	NB	Dual Left	D	48	0.50	E	56	0.85
		Thru/Right	D	45	0.08	D	40	0.19
	SB	Left	D	54	0.34	E	78	0.86
		Thru	D	51	0.12	D	49	0.18
		Right (Overlap)	C	34	0.17	F	83	0.98
	Overall Intersection		***B***	***17***	***0.74***	***E***	***58***	***0.99***
Mapleview Dr./ Bayview Dr. *Signalized*	EB	Dual Left	F	84	0.92	E	78	0.92
		Triple Thru	C	20	0.44	B	20	0.58
		Right	C	34	0.21	C	21	0.12
	WB	Left	C	22	0.23	C	27	0.31
		Dual Thru-Thru/Right	F	84	1.08	D	53	0.93
	NB	Dual Left	D	52	0.53	F	84	0.87
		Thru-Thru/Right	C	33	0.05	D	46	0.41
	SB	Left	D	37	0.78	E	79	0.98
		Dual Thru	C	30	0.20	D	39	0.20
		Right (Channelized)	E	59	0.89	F	81	0.94
	Overall Intersection		***E***	***57***	***0.99***	***D***	***51***	***0.97***
Bayview Dr./ South Village Way *Signalized*	EB	Left/Thru-Thru/Right	D	45	0.05	D	47	0.53
	WB	Left	D	40	0.15	D	37	0.21
		Thru/Right	D	39	0.00	D	36	0.01
	NB	Left	A	5	0.18	A	8	0.33
		Thru-Thru/Right	A	6	0.22	A	10	0.42
	SB	Left	A	6	0.01	A	8	0.04
		Thru-Thru/Right	A	10	0.50	B	14	0.55
	Overall Intersection		***B***	***10***	***0.44***	***B***	***16***	***0.52***
Bayview Dr./ North Village Way *Signalized*	EB	Left	D	40	0.18	D	40	0.54
		Thru	A	< 1	0.00	C	34	0.00
		Right	D	45	0.03	C	35	0.08
	WB	Left	E	57	0.29	A	< 1	0.00
		Thru/Right	A	< 1	0.00	D	49	0.00
	NB	Left	A	4	0.13	A	7	0.29
		Thru-Thru/Right	A	5	0.20	A	7	0.40
	SB	Left	A	4	0.01	A	< 1	0.00
		Thru-Thru/Right	A	8	0.47	B	13	0.56
	Overall Intersection		***A***	***8***	***0.44***	***B***	***13***	***0.58***

Intersection	Approach/Movement		AM Peak Hour			PM Peak Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
Bayview Dr./ Concert Way- Churchill Dr. *Signalized*	EB	Left	D	41	0.22	D	38	0.27
		Thru	A	< 1	0.00	D	42	0.07
		Right	D	44	0.01	D	41	0.04
	WB	Left	D	36	0.15	D	38	0.21
		Thru/Right	D	42	0.15	D	42	0.05
	NB	Left	A	8	0.16	B	15	0.23
		Thru-Thru/Right	A	10	0.21	C	21	0.57
	SB	Left	A	6	0.13	B	16	0.33
		Thru-Thru/Right	B	12	0.52	C	23	0.65
	Overall Intersection		***B***	***16***	***0.44***	***C***	***24***	***0.51***
Bayview Dr./Coca Cola D/W- Industrial D/W South *Unsignalized*	EB	Left/Thru/Right	C	17	0.03	C	20	0.12
	WB	Left/Thru/Right	C	15	0.06	C	21	0.33
	NB	Left	B	10	0.01	B	10	0.01
		Thru-Thru/Right	Unopposed Movement			Unopposed Movement		
	SB	Left	A	9	0.02	A	10	0.01
		Thru-Thru/Right	Unopposed Movement			Unopposed Movement		
Bayview Dr./ Medical Centre South D/W – Industrial D/W North *Unsignalized*	EB	Left	C	19	0.10	C	23	0.35
		Right	B	12	0.05	B	11	0.16
	NB	Left	B	11	0.15	A	10	0.05
		Dual Thru	Unopposed Movement			Unopposed Movement		
	SB	Thru-Thru/Right	Unopposed Movement			Unopposed Movement		
Bayview Dr./Medical Centre North D/W *Unsignalized*	EB	Left/Right	C	15	0.04	B	14	0.14
	NB	Left	B	11	0.04	A	9	0.01
		Dual Thru	Unopposed Movement			Unopposed Movement		
	SB	Thru-Thru/Right	Unopposed Movement			Unopposed Movement		
Bayview Dr./ Big Bay Point Road *Signalized*	EB	Left	C	25	0.42	D	37	0.77
		Dual Thru	D	36	0.64	D	46	0.84
		Right	D	36	0.58	C	33	0.29
	WB	Left	D	36	0.87	E	62	0.92
		Dual Thru	C	25	0.48	C	34	0.53
		Right	C	22	0.24	C	31	0.27
	NB	Left	C	27	0.31	D	47	0.90
		Thru-Thru/Right	C	35	0.38	D	42	0.72
	SB	Left	C	28	0.18	D	40	0.67
		Dual Thru	C	34	0.27	D	45	0.52
		Right	D	35	0.26	D	41	0.17
	Overall Intersection		***C***	***32***	***0.71***	***D***	***42***	***0.95***

Intersection	Approach/Movement		AM Peak Hour			PM Peak Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
Bryne Dr./ Harvie Road *Signalized*	EB	Left	B	13	0.03	C	21	0.03
		Dual Thru	B	17	0.39	C	28	0.57
		Right	B	13	0.01	B	20	0.00
	WB	Left	B	18	0.34	E	66	0.83
		Dual Thru	B	15	0.28	C	28	0.57
		Right	B	14	0.11	C	21	0.08
	NB	Left	C	26	0.05	B	19	0.16
		Dual Thru	C	26	0.09	B	19	0.23
		Right	C	26	0.07	C	21	0.32
	SB	Left	C	31	0.37	D	47	0.86
		Dual Thru	C	27	0.23	B	19	0.22
		Right	C	26	0.06	B	18	0.09
	Overall Intersection		***B***	***20***	***0.38***	***C***	***28***	***0.85***

5.3.3 Queue Analysis – 2036 Background

Table 5.10 presents the results for the 95th and 50th percentile queue lengths. The individual movements where the 95th and 50th percentile queue lengths exceed the available storage lane lengths are highlighted in yellow and red, respectively.

The queue analysis showed that there are relatively minor deficiencies during both the AM or PM peak hour where either the 95th or 50th percentile queues could occasionally and temporarily exceed the available storage lane lengths. In comparison to the 2031 analysis, there are a similar number of storage lane deficiencies but the 95th and 50th percentile queues are generally shorter. This is presumed to be related to the redistribution of traffic facilitated by the road network improvements in the City's 2031 Emme model.

For the intersections where mitigation was proposed to address operational issues, i.e. for the southbound right turn at Mapleview Drive/Park Place Boulevard-Costco Access and the southbound left turn at Mapleview Drive/Bayview Drive, queues are shorter, and any remaining deficiencies are minor. As noted previously, there are physical constraints to increasing storage lane lengths in most cases.

With regard to the Highway 400 ramp terminals with the DDI design, the 95th and 50th percentile queues for either the northbound or southbound off ramps are well within the available total ramp storage lengths.).

For the Mapleview Drive/Highway 400 Northbound Off/On Ramps intersection under the Diamond Configuration, the 95th and 50th percentile queues for the northbound off ramp are well within the available total ramp storage length for both the AM and PM peak hours.

For the Mapleview Drive/Highway 400 Southbound Off/On Ramps intersections under the Diamond Configuration, the 95th and 50th percentile queues for the southbound off ramp are well within the available total ramp storage lengths for both the AM and PM peak hours.

TABLE 5.10: QUEUES – 2036 BACKGROUND

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Mapleview Dr./ Bryne Dr. *Signalized*	EB	Left	40 TWLTL	36	4	12	28	44	-4	20	20
		Dual Thru-Thru/Right	260	95	165	63	197	89	171	60	200
	WB	Left	40 TWLTL	34	6	32	8	53	-13	32	8
		Dual Thru-Thru/Right	160	97	63	63	97	29	131	8	152
	NB	Left	65	40	25	22	43	34	31	17	48
		Thru-Thru/Right	100	15	85	5	95	73	27	40	60
	SB	Left	40 TWLTL	22	18	9	31	24	16	11	29
		Thru-Thru/Right	330	27	303	15	315	18	312	7	323
Mapleview Dr./ Barrie View Dr. *Signalized*	EB	Left	80 TWLTL	17	63	7	73	54	26	18	62
		Triple Thru-Thru/Right	160	53	107	30	130	111	49	73	87
	WB	Dual Left	65	60	5	42	23	60	5	39	26
		Dual Thru-Thru/Right	100	85	15	52	48	82	18	45	55
	NB	Left	35	7	28	2	33	25	10	10	25
		Thru	50	7	43	1	49	38	12	19	31
		Right	50	40	10	22	28	109	-59	82	-32
	SB	Left	35	54	-19	43	-8	50	-15	47	-12
		Thru-Thru/Right	290	119	171	50	240	208	82	124	166

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Mapleview Dr./ HWY 400 SB Off/On Ramp *Signalized*	EB	Quad Thru	100	132	-32	82	18	126	-26	88	12
		Right	55	48	7	15	40	49	6	13	42
	WB	Left	130	98	32	60	70	101	29	60	70
		Triple Thru	165	66	99	41	124	58	107	44	121
	SB	Dual Left	530	315	215	192	338	413	117	313	217
		Dual Right	530	226	304	91	439	464	66	231	299
Mapleview Dr./ HWY 400 NB Off/On Ramp *Signalized*	EB	Dual Left	135	48	87	28	107	113	22	66	69
		Triple Thru	165	83	82	26	139	133	32	56	109
	WB	Triple Thru	205	94	111	53	152	96	109	68	137
		Right	150	92	58	56	94	162	-12	104	46
	NB	Dual Left	560	75	485	46	514	78	482	52	508
		Dual Right	560	44	516	25	535	98	462	66	494
Mapleview Dr./HWY 400 NB Off/On Ramp *Mitigation* *Signalized*	EB	Dual Left	135	47	88	26	109	87	48	49	86
		Triple Thru	165	94	71	29	136	118	47	39	126
	WB	Triple Thru	205	94	111	52	153	126	79	82	123
		Right (Channel-Yield)	150	29	121	6	144	77	73	45	105
	NB	Dual Left	560	70	490	45	515	77	483	51	509
		Dual Right	560	46	514	25	535	104	456	68	492
Mapleview Dr./ HWY 400 SB Off/On Ramp DDI *Signalized*	EB	Triple Thru	100	31	69	25	75	37	63	30	70
	WB	Triple Thru	165	53	112	40	125	51	114	45	120
	N-E Ramp		530	67	463	52	478	67	463	56	474
	N-W Ramp		530	68	462	54	476	49	481	29	501
Mapleview Dr./ HWY 400 NB Off/On Ramp DDI *Signalized*	EB	Triple Thru	165	65	100	59	106	65	100	59	106
	WB	Triple Thru	205	47	158	38	167	42	163	37	168
	S-E Ramp		560	48	512	26	534	73	487	53	507
	S-W Ramp		560	64	496	44	516	70	490	57	503

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Mapleview Dr./ Park Place Blvd. *Signalized*	EB	Dual Left	165	57	108	40	125	161	4	96	69
		Triple Thru	205	51	154	32	173	166	39	95	110
		Right	185	7	178	1	184	12	173	4	181
	WB	Left	60	13	47	3	57	42	18	15	45
		Triple Thru	125	131	-6	77	48	154	-29	124	1
		Right	125	59	66	11	114	220	-95	112	13
	NB	Dual Left	65	44	21	25	40	144	-79	133	-68
		Thru/Right	65	17	48	7	58	176	-111	85	-20
	SB	Left	65	15	50	6	59	72	-7	44	21
		Thru	85	8	77	3	82	126	-41	52	33
		Right	85	44	41	23	62	101	-16	101	-16
Mapleview Dr./ Park Place Blvd. *Mitigation* *Signalized*	EB	Dual Left	165	58	107	39	126	188	-23	101	64
		Triple Thru	205	51	154	29	176	196	9	97	108
		Right	185	6	179	1	184	11	174	4	181
	WB	Left	60	13	47	3	57	42	18	17	43
		Triple Thru	125	103	22	60	65	161	-36	110	15
		Right	125	50	75	9	116	185	-60	72	53
	NB	Dual Left	65	46	19	25	40	138	-73	134	-69
		Thru/Right	65	14	51	6	59	182	-117	90	-25
	SB	Left	65	16	49	7	58	77	-12	54	11
		Thru	85	9	76	3	82	126	-41	54	31
		Right (Overlap)	85	39	46	21	64	113	-28	97	-12

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Mapleview Dr./ Bayview Dr. *Signalized*	EB	Dual Left	80	66	14	44	36	99	-19	73	7
		Triple Thru	125	40	85	24	101	99	26	45	80
		Right	45	47	-2	25	20	27	18	13	32
	WB	Left	125	68	57	17	108	16	109	6	119
		Dual Thru-Thru/Right	705	293	412	252	453	319	386	251	454
	NB	Dual Left	150	45	105	23	127	75	75	47	103
		Thru-Thru/Right	80	15	65	6	74	58	22	35	45
	SB	Left	100	137	-37	112	-12	138	-38	112	-12
		Dual Thru	210	294	-84	166	44	286	-76	173	37
		Right (Channelized)	65	90	-25	41	24	99	-34	61	4
Bayview Dr./ South Village Way *Signalized*	EB	Left/Thru-Thru/Right	65	22	43	10	55	75	-10	28	37
	WB	Left	50	18	32	6	44	30	20	11	39
		Thru/Right	50	5	45	1	49	11	39	3	47
	NB	Left	45	26	19	12	33	37	8	17	28
		Thru-Thru/Right	210	44	166	16	194	79	131	38	172
	SB	Left	40	31	9	5	35	33	7	6	34
		Thru-Thru/Right	185	204	-19	89	96	219	-34	115	70

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Bayview Dr./ North Village Way *Signalized*	EB	Left	45	20	25	8	37	41	4	25	20
		Thru	85	0	85	0	85	27	58	4	81
		Right	45	21	24	8	37	58	-13	25	20
	WB	Left	60	8	52	2	58	0	60	0	60
		Thru/Right	60	0	60	0	60	1	59	1	59
	NB	Left	50	15	35	7	43	20	30	10	40
		Thru-Thru/Right	185	29	156	9	176	48	137	21	164
	SB	Left	55	20	35	2	53	0	55	0	55
		Thru-Thru/Right	235	158	77	54	181	198	37	87	148
Bayview Dr./ Concert Way-Churchill Dr. *Signalized*	EB	Left	85	17	68	7	78	32	53	16	69
		Thru	130	0	130	0	130	19	111	6	124
		Right	85	12	73	5	80	20	65	9	76
	WB	Left	35	21	14	9	26	28	7	14	21
		Thru/Right	650	39	611	23	627	19	631	7	643
	NB	Left	50	26	24	10	40	34	16	11	39
		Thru-Thru/Right	235	36	199	13	222	92	143	58	177
	SB	Left	45	29	16	11	34	57	-12	22	23
		Thru-Thru/Right	200	92	108	42	158	151	49	92	108
Bayview Dr./Coca Cola D/W – Industrial D/W South *Unsignalized*	EB	Left/Thru/Right	100	9	91	2	98	24	76	10	90
	WB	Left/Thru/Right	100	20	80	7	93	89	11	38	62
	NB	Left	50	7	43	2	48	5	45	1	49
		Thru-Thru/Right	-	Unopposed Movement				Unopposed Movement			
	SB	Left	50	6	44	1	49	7	43	7	43
		Thru-Thru/Right	-	Unopposed Movement				Unopposed Movement			

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Bayview Dr./ Medical Centre South D/W – Industrial D/W North *Unsignalized*	EB	Left	100	18	82	8	92	90	10	39	61
		Right	100	13	87	6	94	62	38	20	80
	NB	Left	35	20	15	11	24	17	18	6	29
		Dual Thru	200	Unopposed Movement				Unopposed Movement			
	SB	Thru-Thru/Right	100	Unopposed Movement				Unopposed Movement			
Bayview Dr./Medical Centre North D/W *Unsignalized*	EB	Left/Right	35	11	24	3	32	140	-105	73	-38
	NB	Left	25	12	13	4	21	10	15	2	23
		Dual Thru	130	Unopposed Movement				Unopposed Movement			
	SB	Thru-Thru/Right	90	Unopposed Movement				Unopposed Movement			
Bayview Dr./ Big Bay Point Road *Signalized*	EB	Left	40	64	-24	30	10	91	-51	67	-27
		Dual Thru	300	104	196	63	237	257	43	134	166
		Right	50	85	-35	50	0	99	-49	57	-7
	WB	Left	50	98	-48	64	-14	94	-44	56	-6
		Dual Thru	745	102	643	57	688	117	628	64	681
		Right	50	37	13	17	33	44	6	19	31
	NB	Left	50	45	5	22	28	105	-55	88	-38
		Thru-Thru/Right	200	77	123	46	154	119	81	99	101
	SB	Left	65	25	40	12	53	72	-7	41	24
		Dual Thru	650	60	590	60	590	62	588	40	610
		Right		67	-2	67	-2	51	14	28	37

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Bryne Dr./ Harvie Road *Signalized*	EB	Left	60	10	50	3	57	14	46	2	58
		Dual Thru	300	64	236	43	257	98	202	69	231
		Right	60	8	52	2	58	5	55	1	59
	WB	Left	60	40	20	21	39	97	-37	72	-12
		Dual Thru	300	54	246	31	269	255	45	133	167
		Right	60	23	37	12	48	26	34	10	50
	NB	Left	60	13	47	5	55	25	35	12	48
		Dual Thru	300	29	271	15	285	49	251	33	267
		Right	60	18	42	9	51	45	15	24	36
	SB	Left	60	52	8	32	28	84	-24	80	-20
		Dual Thru	300	47	253	32	268	181	119	152	148
		Right	60	19	41	8	52	35	25	14	46

5.3.4 Capacity Analysis – 2036 Total

Table 5.11 presents the results of the analysis of AM and PM peak hour total traffic operations. V/C ratios greater than the MTO criteria are highlighted. **Appendix I** contains the Synchro analysis reports.

In terms of the net impact of the proposed Park Place North Lands industrial development, there are relatively minor increases in v/c ratios at most intersections in the study area. As in the assessment of 2036 background traffic conditions, the intersections of Mapleview Drive/Park Place Boulevard-Costco Access and Mapleview Drive/Highway 400 Northbound Off-On Ramp intersection would require minor mitigation measures

The analysis for the two noted intersections was conducted without improvement measures to represent a *"do nothing"* condition and with the same potential improvements considered in the previous analyses. The results with mitigation measures in place are shown in the next row of the table.

The intersections where mitigation has been considered are as follows:

Mapleview Drive/Park Place Boulevard-Costco Access

- The initial analysis showed that this intersection would be over capacity (v/c of 1.14) and several movements would have v/c ratios above the 0.85 criteria or over capacity during the PM peak hour;
- The key problem movement is the southbound right turn from Park Place Boulevard to Mapleview Drive (v/c of 1.46). It is noted that no site generated traffic would be added to this movement;
- The mitigation considered is to implement a right turn overlap phase that would run concurrently with the non-conflicting eastbound and westbound advanced left turn phases;
- The improvement results in the intersection operating at improved conditions (v/c of 1.03), with less delay, and the southbound right turn movement operating with improved conditions (v/c of 1.03); and
- As noted previously, we understand City staff intend to carry out a "Multi-Modal Level of Service/Traffic Study" for the Mapleview Drive corridor. Again, this will allow additional improvement alternatives to be examined for this intersection that would assist in addressing shorter and longer term operational concerns while complementing other proposed improvements to the east and west of this intersection.

Mapleview Drive/Highway 400 Northbound Off/On Ramps

- The key problem movement is the westbound right turn from Mapleview Drive to Highway 400 northbound the initial analysis reports the movement would be at-capacity (v/c of 1.06);
- With a channelized right turn design as previously described, the intersection operation would be within capacity (v/c of 0.90) and at a good level of service (C). It is re-stated that the implementation of this type of improvement would likely represent a throw-away cost related to the eventual future implementation of the MTO-recommended DDI design; and
- It is also re-stated that as noted previously we understand City staff intend to carry out a “Multi-Modal Level of Service/Traffic Study” for the Mapleview Drive corridor. This will provide a focused opportunity to assess additional alternatives for shorter term operational and design solutions for the Mapleview Drive/ Highway 400 Northbound Off/On Ramps intersection and to consider ways to avoid throw-away costs in light of the longer term solution of the MTO-recommended DDI.

The intersection of Mapleview Drive/Bayview Drive forecasts the westbound shared through/right movement as operating over-capacity (v/c = 1.13) under the PM peak hour. The forecast volume of westbound right turn movements would warrant the consideration of an auxiliary turn lane; however, as previously mentioned the intersection is physically built-out. It is anticipated that this issue will be examined as part of the Mapleview Drive corridor study.

The analysis of 2036 total traffic conditions are similar to background traffic conditions, the Bayview Drive study area intersections operate within capacity and at good levels of service (D or better).

The Bayview Drive/Big Bay Point Road intersection would operate at acceptable levels of service and within capacity.

The Bryne Drive/Harvie Road intersection is forecast to operate well within capacity and at a good level of service under both the AM and PM peak hours.

The analysis results for the DDI show that the two ramp terminal intersections would operate at a very good level of service (C or better) in the AM and PM peak hours and well within capacity. These operational measures apply primarily to the through movements since as previously noted, left and right turns from Mapleview Drive to the Highway 400 on ramps operate as free flow although motorists making left turns could experience delay in the through lanes prior to reaching the taper section at the ramps. The exiting movements from the

Highway 400 off ramps would operate at very good levels of service (C or better) and well within capacity.

It should be understood, however, that the improved operations at the interchange will not likely carry over to the adjacent Mapleview Drive intersections during the busiest conditions. The traffic reporting that was part of the MTO 2017 Transportation Environmental Study Report concluded that the PM peak hour traffic operations of adjacent intersections would be independent of the configuration of the interchange – i.e. the implementation of the DDI neither improves nor worsens the traffic operations at other intersections in the study area section of the Mapleview Drive corridor, it only improves ramp terminal operations.

Notwithstanding, given the timing for implementation is uncertain the operational analyses identifies the existing Diamond Interchange configuration is forecast to operate near capacity, but still within capacity up to the 2036 horizon year.

TABLE 5.11: OPERATIONAL ANALYSIS – 2036 TOTAL

Intersection	Approach/Movement		AM Peak Hour			PM Peak Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
Mapleview Dr./ Bryne Dr. *Signalized*	EB	Left	B	18	0.21	B	10	0.40
		Dual Thru-Thru/Right	C	29	0.69	B	17	0.50
	WB	Left	E	60	0.80	D	43	0.61
		Dual Thru-Thru/Right	A	8	0.47	A	2	0.44
	NB	Left	D	38	0.42	D	50	0.46
		Thru-Thru/Right	D	42	0.06	E	57	0.46
	SB	Left	D	41	0.16	D	53	0.35
		Thru-Thru/Right	D	45	0.21	E	56	0.10
	Overall Intersection		***C***	***25***	***0.75***	***B***	***19***	***0.61***
Mapleview Dr./ Barrie View Dr. *Signalized*	EB	Left	B	12	0.21	C	27	0.38
		Triple Thru-Thru/Right	A	5	0.48	B	20	0.62
	WB	Dual Left	E	58	0.70	E	72	0.78
		Dual Thru-Thru/Right	A	9	0.75	B	11	0.71
	NB	Left	D	45	0.04	D	44	0.21
		Thru	D	46	0.02	D	49	0.31
		Right	D	46	0.10	E	68	0.79
	SB	Left	D	46	0.76	D	46	0.75
		Thru-Thru/Right	C	35	0.04	D	37	0.03
	Overall Intersection		***B***	***16***	***0.79***	***C***	***28***	***0.77***
Mapleview Dr./ HWY 400 SB Off/On Ramp *Signalized*	EB	Quad Thru	C	23	0.77	C	29	0.89
		Right	A	7	0.22	A	10	0.23
	WB	Left	D	46	0.95	D	40	0.94
		Triple Thru	A	9	0.59	B	10	0.57
	SB	Dual Left	D	37	0.69	D	55	0.84
		Dual Right	D	46	0.85	D	42	0.36
	Overall Intersection		***C***	***25***	***0.94***	***C***	***26***	***0.94***
Mapleview Dr./ HWY 400 NB Off/On Ramp *Signalized*	EB	Dual Left	D	36	0.70	D	55	0.99
		Triple Thru	A	8	0.53	B	16	0.62
	WB	Triple Thru	B	10	0.68	C	21	0.83
		Right	D	39	0.56	E	63	1.06
	NB	Dual Left	D	47	0.74	D	49	0.67
		Dual Right	D	39	0.37	E	76	0.95
	Overall Intersection		***B***	***19***	***0.70***	***C***	***36***	***1.01***

Intersection	Approach/Movement		AM Peak Hour			PM Peak Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
Mapleview Dr./ HWY 400 NB Off/On Ramp *Mitigation* *Signalized*	EB	Dual Left	D	36	0.70	D	40	0.90
		Triple Thru	A	8	0.53	B	12	0.63
	WB	Triple Thru	A	10	0.68	C	25	0.89
		Right (Channel/Yield)	A	1	0.53	A	1	0.68
	NB	Dual Left	D	47	0.74	D	48	0.65
		Dual Right	D	39	0.37	E	67	0.91
	Overall Intersection		***B***	***14***	***0.70***	***C***	***24***	***0.90***
Mapleview Dr./ HWY 400 West Terminal *DDI* *Signalized*	EB	Triple Through	C	31	0.76	C	35	0.89
	WB	Triple Through	B	11	0.71	C	27	0.88
	Overall Intersection		***C***	***20***	***0.73***	***C***	***32***	***0.88***
	W-S Ramp (Right)		A	< 1	0.12	A	< 1	0.11
	E-S Ramp (Left)		A	6	0.28	A	6	0.30
	N-W Ramp (Dual Right)		C	27	0.61	C	20	0.21
	N-E Ramp (Dual Left)		C	21	0.43	C	27	0.46
Mapleview Dr./ HWY 400 East Terminal *DDI* *Signalized*	EB	Triple Through	B	19	0.83	C	25	0.90
	WB	Triple Through	C	28	0.77	D	38	0.87
	Overall Intersection		***C***	***24***	***0.80***	***C***	***31***	***0.89***
	W-N Ramp (Left)		A	5	0.20	A	7	0.42
	E-N Ramp (Right)		A	< 1	0.45	A	< 1	0.63
	S-E Ramp (Dual Right)		B	19	0.21	C	28	0.50
	S-W Ramp (Dual Left)		B	19	0.31	C	21	0.30
Mapleview Dr./ Park Place Blvd. *Signalized*	EB	Dual Left	E	66	0.60	F	230	1.33
		Triple Thru	A	3	0.53	D	52	1.05
		Right	A	9	0.02	A	7	0.04
	WB	Left	A	8	0.09	D	39	0.51
		Triple Thru	B	18	0.97	F	95	1.13
		Right	A	1	0.07	B	17	0.32
	NB	Dual Left	D	48	0.50	D	55	0.84
		Thru/Right	D	45	0.08	D	40	0.19
	SB	Left	D	49	0.29	E	63	0.79
		Thru	D	47	0.06	D	45	0.15
		Right	D	48	0.16	F	278	1.46
	Overall Intersection		***B***	***19***	***0.76***	***F***	***95***	***1.14***

Intersection	Approach/Movement		AM Peak Hour			PM Peak Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
Mapleview Dr./ Park Place Blvd. *Mitigation* *Signalized*	EB	Dual Left	E	64	0.52	F	87	0.95
		Triple Thru	A	3	0.52	C	21	0.89
		Right	A	8	0.02	A	3	0.04
	WB	Left	A	8	0.09	D	37	0.52
		Triple Thru	C	21	0.98	E	56	1.05
		Right	A	1	0.07	B	12	0.29
	NB	Dual Left	D	48	0.50	F	86	1.00
		Thru/Right	D	45	0.08	D	44	0.22
	SB	Left	D	52	0.38	F	92	0.93
		Thru	D	49	0.08	D	49	0.18
		Right (Overlap)	C	33	0.25	F	96	1.03
	Overall Intersection		***B***	***19***	***0.76***	***D***	***53***	***1.03***
Mapleview Dr./ Bayview Dr. *Signalized*	EB	Dual Left	F	91	0.95	F	82	0.96
		Triple Thru	C	21	0.45	B	20	0.60
		Right	C	34	0.21	C	21	0.12
	WB	Left	C	22	0.23	C	28	0.32
		Dual Thru-Thru/Right	F	85	1.08	E	60	0.97
	NB	Dual Left	D	52	0.53	F	86	0.88
		Thru-Thru/Right	C	33	0.05	D	45	0.40
	SB	Left	D	37	0.79	E	77	0.97
		Dual Thru	C	30	0.20	D	38	0.19
		Right (Channelized)	E	60	0.90	F	82	0.95
	Overall Intersection		***E***	***59***	***1.00***	***D***	***54***	***1.00***
Bayview Dr./ South Village Way *Signalized*	EB	Left/Thru-Thru/Right	D	45	0.15	D	47	0.56
	WB	Left	D	40	0.16	D	37	0.22
		Thru/Right	D	39	0.00	D	35	0.01
	NB	Left	A	5	0.19	A	9	0.37
		Thru-Thru/Right	A	6	0.22	A	10	0.43
	SB	Left	A	6	0.01	A	9	0.04
		Thru-Thru/Right	A	10	0.50	B	16	0.58
	Overall Intersection		***B***	***11***	***0.45***	***B***	***17***	***0.54***
Bayview Dr./ North Village Way *Signalized*	EB	Left	D	40	0.23	D	41	0.59
		Thru	A	< 1	0.00	C	34	0.00
		Right	D	46	0.03	C	35	0.08
	WB	Left	E	57	0.29	A	< 1	0.00
		Thru/Right	A	< 1	0.00	D	48	0.00
	NB	Left	A	4	0.13	A	8	0.33
		Thru-Thru/Right	A	5	0.20	A	7	0.41
	SB	Left	A	4	0.01	A	< 1	0.00
		Thru-Thru/Right	A	9	0.48	B	14	0.59
	Overall Intersection		***A***	***9***	***0.45***	***B***	***13***	***0.61***

Intersection	Approach/Movement		AM Peak Hour			PM Peak Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
Bayview Dr./ Concert Way- Churchill Dr. *Signalized*	EB	Left	D	37	0.26	D	40	0.31
		Thru	A	< 1	0.00	D	43	0.07
		Right	D	40	0.02	D	42	0.04
	WB	Left	D	39	0.17	D	38	0.21
		Thru/Right	D	43	0.15	D	42	0.04
	NB	Left	A	8	0.17	B	16	0.25
		Thru-Thru/Right	B	10	0.22	C	23	0.60
	SB	Left	A	7	0.13	B	15	0.31
		Thru-Thru/Right	B	13	0.53	C	22	0.65
	Overall Intersection		***B***	***17***	***0.46***	***C***	***24***	***0.53***
Bayview Dr./Coca Cola D/W- Industrial D/W South *Unsignalized*	EB	Left/Thru/Right	C	17	0.03	C	21	0.13
	WB	Left/Thru/Right	C	16	0.06	C	21	0.34
	NB	Left	B	10	0.01	B	11	0.01
		Thru-Thru/Right	Unopposed Movement			Unopposed Movement		
	SB	Left	A	9	0.02	A	10	0.01
		Thru-Thru/Right	Unopposed Movement			Unopposed Movement		
Bayview Dr./ Medical Centre South D/W – Industrial D/W North *Unsignalized*	EB	Left	C	19	0.10	C	24	0.36
		Right	B	12	0.05	B	11	0.16
	NB	Left	B	11	0.15	A	10	0.05
		Dual Thru	Unopposed Movement			Unopposed Movement		
	SB	Thru-Thru/Right	Unopposed Movement			Unopposed Movement		
Bayview Dr./Medical Centre North D/W *Unsignalized*	EB	Left/Right	C	15	0.04	B	15	0.14
	NB	Left	B	11	0.04	A	10	0.01
		Dual Thru	Unopposed Movement			Unopposed Movement		
	SB	Thru-Thru/Right	Unopposed Movement			Unopposed Movement		
Bayview Dr./ Big Bay Point Road *Signalized*	EB	Left	C	25	0.42	D	37	0.77
		Dual Thru	D	36	0.64	D	47	0.85
		Right	D	36	0.58	C	33	0.30
	WB	Left	D	37	0.88	E	72	0.95
		Dual Thru	C	25	0.48	C	34	0.53
		Right	C	22	0.24	C	31	0.27
	NB	Left	C	27	0.32	D	55	0.94
		Thru-Thru/Right	C	35	0.42	D	43	0.74
	SB	Left	C	28	0.19	D	41	0.69
		Dual Thru	C	34	0.27	D	46	0.56
		Right	D	35	0.26	D	41	0.17
	Overall Intersection		***C***	***32***	***0.72***	***D***	***44***	***1.00***

Intersection	Approach/Movement		AM Peak Hour			PM Peak Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
Bryne Dr./ Harvie Road *Signalized*	EB	Left	B	13	0.03	C	21	0.04
		Dual Thru	B	17	0.39	C	28	0.58
		Right	B	13	0.01	B	20	0.00
	WB	Left	B	18	0.34	E	69	0.85
		Dual Thru	B	15	0.28	C	28	0.58
		Right	B	14	0.11	C	21	0.09
	NB	Left	C	26	0.05	B	19	0.16
		Dual Thru	C	26	0.09	B	19	0.23
		Right	C	26	0.07	C	21	0.32
	SB	Left	C	31	0.37	D	47	0.86
		Dual Thru	C	27	0.23	B	19	0.22
		Right	C	26	0.06	B	18	0.09
	Overall Intersection		***B***	***20***	***0.38***	***C***	***28***	***0.85***

5.3.5 Queue Analysis – 2036 Total

Table 5.12 presents the results for the 95th and 50th percentile queue lengths. The individual movements where the 95th and 50th percentile queue lengths exceed the available storage lane lengths are highlighted in yellow and red, respectively.

The queue analysis showed that there are relatively minor deficiencies during both the AM or PM peak hour where either the 95th or 50th percentile queues could occasionally and temporarily exceed the available storage lane lengths. In comparison 2036 background conditions, the reported queues under total traffic conditions are slightly exacerbated with the addition of the proposed industrial development on the North Lands. As noted previously, there are physical constraints to increasing storage lane lengths in most cases.

With regard to the Highway 400 ramp terminals with the DDI design, the 95th and 50th percentile queues for either the northbound or southbound off ramps are well within the available total ramp storage lengths.

For the Mapleview Drive/Highway 400 Northbound Off/On Ramps intersection under the Diamond Configuration, the 95th and 50th percentile queues for the northbound off ramp are well within the available total ramp storage lengths for both the AM and PM peak hours.

For the Mapleview Drive/Highway 400 Southbound Off/On Ramps intersection under the Diamond Configuration, the 95th and 50th percentile queues for the southbound off ramp are well within the available total ramp storage lengths for both the AM and PM peak hours.

TABLE 5.12: QUEUES – 2036 TOTAL

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Mapleview Dr./ Bryne Dr. *Signalized*	EB	Left	40 TWLTL	45	-5	13	27	60	-20	27	13
		Dual Thru-Thru/Right	260	239	21	111	149	129	131	76	184
	WB	Left	40 TWLTL	35	5	31	9	56	-16	36	4
		Dual Thru-Thru/Right	160	99	61	59	101	33	127	9	151
	NB	Left	65	55	10	27	38	37	28	20	45
		Thru-Thru/Right	100	25	75	7	93	87	13	50	50
	SB	Left	40 TWLTL	24	16	10	30	24	16	12	28
		Thru-Thru/Right	330	31	299	15	315	16	314	6	324
Mapleview Dr./ Barrie View Dr. *Signalized*	EB	Left	80 TWLTL	51	29	13	67	89	-9	36	44
		Triple Thru-Thru/Right	160	136	24	72	88	127	33	91	69
	WB	Dual Left	65	55	10	38	27	60	5	40	25
		Dual Thru-Thru/Right	100	83	17	48	52	88	12	48	52
	NB	Left	35	6	29	1	34	27	8	11	24
		Thru	50	6	44	1	49	41	9	21	29
		Right	50	59	-9	27	23	110	-60	80	-30
	SB	Left	35	56	-21	43	-8	53	-18	46	-11
		Thru-Thru/Right	290	175	115	72	218	229	61	128	162

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Mapleview Dr./ HWY 400 SB Off/On Ramp *Signalized*	EB	Quad Thru	100	146	-46	110	-10	137	-37	103	-3
		Right	55	78	-23	26	29	66	-11	20	35
	WB	Left	130	102	28	60	70	114	16	64	66
		Triple Thru	165	71	94	43	122	77	88	47	118
	SB	Dual Left	530	420	110	285	245	399	131	319	211
		Dual Right	530	441	89	215	315	458	72	229	301
Mapleview Dr./ HWY 400 NB Off/On Ramp *Signalized*	EB	Dual Left	135	187	-52	74	61	159	-24	84	51
		Triple Thru	165	222	-57	100	65	199	-34	93	72
	WB	Triple Thru	205	116	89	65	140	109	96	69	136
		Right	150	108	42	65	85	130	20	92	58
	NB	Dual Left	560	98	462	53	507	153	407	64	496
		Dual Right	560	115	445	51	509	227	333	109	451
Mapleview Dr./HWY 400 NB Off/On Ramp *Mitigation* *Signalized*	EB	Dual Left	135	47	88	25	110	87	48	50	85
		Triple Thru	165	90	75	29	136	102	63	34	131
	WB	Triple Thru	205	111	94	56	149	139	66	84	121
		Right (Channel-Yield)	150	28	122	7	143	79	71	43	107
	NB	Dual Left	560	66	494	44	516	78	482	52	508
		Dual Right	560	50	510	28	532	85	475	71	489
Mapleview Dr./ HWY 400 SB Off/On Ramp DDI *Signalized*	EB	Triple Thru	100	33	67	26	74	38	62	30	70
	WB	Triple Thru	165	54	111	42	123	51	114	46	119
	N-E Ramp		530	67	463	51	479	67	463	55	475
	N-W Ramp		530	66	464	55	475	50	480	30	500
Mapleview Dr./ HWY 400 NB Off/On Ramp DDI *Signalized*	EB	Triple Thru	165	65	100	59	106	66	99	59	106
	WB	Triple Thru	205	47	158	38	167	42	163	37	168
	S-E Ramp		560	42	518	25	535	76	484	56	504
	S-W Ramp		560	67	493	44	516	70	490	58	502

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Mapleview Dr./ Park Place Blvd. *Signalized*	EB	Dual Left	165	234	-69	159	6	233	-68	154	11
		Triple Thru	205	299	-94	151	54	170	35	158	47
		Right	185	6	179	1	184	34	151	6	179
	WB	Left	60	9	51	3	57	46	14	17	43
		Triple Thru	125	118	7	57	68	155	-30	121	4
		Right	125	60	65	11	114	209	-84	94	31
	NB	Dual Left	65	64	1	36	29	156	-91	126	-61
		Thru/Right	65	18	47	7	58	154	-89	60	5
	SB	Left	65	26	39	11	54	73	-8	46	19
		Thru	85	11	74	3	82	135	-50	61	24
		Right	85	70	15	38	47	102	-17	101	-16
Mapleview Dr./ Park Place Blvd. *Mitigation* *Signalized*	EB	Dual Left	165	59	106	40	125	127	38	71	94
		Triple Thru	205	50	155	30	175	122	83	66	139
		Right	185	8	177	2	183	10	175	4	181
	WB	Left	60	9	51	3	57	37	23	14	46
		Triple Thru	125	111	14	63	62	154	-29	104	21
		Right	125	56	69	11	114	161	-36	58	67
	NB	Dual Left	65	44	21	25	40	137	-72	134	-69
		Thru/Right	65	16	49	6	59	177	-112	81	-16
	SB	Left	65	18	47	9	56	80	-15	58	7
		Thru	85	7	78	2	83	135	-50	66	19
		Right (Overlap)	85	49	36	27	58	115	-30	97	-12

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Mapleview Dr./ Bayview Dr. *Signalized*	EB	Dual Left	80	77	3	41	39	100	-20	70	10
		Triple Thru	125	45	80	29	96	92	33	42	83
		Right	45	47	-2	24	21	28	17	12	33
	WB	Left	125	71	54	17	108	20	105	8	117
		Dual Thru-Thru/Right	705	296	409	252	453	291	414	251	454
	NB	Dual Left	150	43	107	22	128	103	47	60	90
		Thru-Thru/Right	80	13	67	5	75	70	10	37	43
	SB	Left	100	119	-19	117	-17	118	-18	117	-17
		Dual Thru	210	262	-52	202	8	238	-28	210	0
		Right (Channelized)	65	93	-28	47	18	99	-34	62	3
Bayview Dr./ South Village Way *Signalized*	EB	Left/Thru-Thru/Right	65	21	44	10	55	57	8	33	32
	WB	Left	50	43	7	13	37	26	24	10	40
		Thru/Right	50	6	44	1	49	10	40	3	47
	NB	Left	45	25	20	11	34	44	1	20	25
		Thru-Thru/Right	210	34	176	12	198	76	134	35	175
	SB	Left	40	31	9	5	35	36	4	8	32
		Thru-Thru/Right	185	242	-57	119	66	219	-34	122	63

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Bayview Dr./ North Village Way *Signalized*	EB	Left	45	21	24	9	36	44	1	27	18
		Thru	85	0	85	0	85	33	52	5	80
		Right	45	36	9	6	39	56	-11	25	20
	WB	Left	60	9	51	8	52	0	60	0	60
		Thru/Right	60	0	60	21	39	3	57	1	59
	NB	Left	50	16	34	10	40	24	26	12	38
		Thru-Thru/Right	185	29	156	10	175	43	142	18	167
	SB	Left	55	17	38	11	44	0	55	0	55
		Thru-Thru/Right	235	206	29	44	191	236	-1	101	134
Bayview Dr./ Concert Way-Churchill Dr. *Signalized*	EB	Left	85	20	65	9	76	34	51	18	67
		Thru	130	0	130	0	130	20	110	7	123
		Right	85	14	71	6	79	20	65	9	76
	WB	Left	35	21	14	8	27	30	5	15	20
		Thru/Right	650	34	616	21	629	16	634	6	644
	NB	Left	50	29	21	10	40	38	12	12	38
		Thru-Thru/Right	235	29	206	10	225	96	139	61	174
	SB	Left	45	36	9	11	34	53	-8	20	25
		Thru-Thru/Right	200	102	98	44	156	177	23	103	97
Bayview Dr./Coca Cola D/W – Industrial D/W South *Unsignalized*	EB	Left/Thru/Right	100	8	92	2	98	24	76	9	91
	WB	Left/Thru/Right	100	19	81	7	93	90	10	45	55
	NB	Left	50	6	44	2	48	4	46	1	49
		Thru-Thru/Right	-	Unopposed Movement				Unopposed Movement			
	SB	Left	50	8	42	1	49	4	46	1	49
		Thru-Thru/Right	-	Unopposed Movement				Unopposed Movement			

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Bayview Dr./ Medical Centre South D/W – Industrial D/W North *Unsignalized*	EB	Left	100	16	84	7	93	107	-7	49	51
		Right	100	12	88	5	95	95	5	32	68
	NB	Left	35	19	16	11	24	21	14	8	27
		Dual Thru	200	Unopposed Movement				Unopposed Movement			
	SB	Thru-Thru/Right	100	Unopposed Movement				Unopposed Movement			
Bayview Dr./Medical Centre North D/W *Unsignalized*	EB	Left/Right	35	12	23	5	30	143	-108	81	-46
	NB	Left	25	12	13	4	21	11	14	2	23
		Dual Thru	130	Unopposed Movement				Unopposed Movement			
	SB	Thru-Thru/Right	90	Unopposed Movement				Unopposed Movement			
Bayview Dr./ Big Bay Point Road *Signalized*	EB	Left	40	60	-20	27	13	92	-52	68	-28
		Dual Thru	300	94	206	61	239	380	-80	194	106
		Right	50	81	-31	44	6	102	-52	60	-10
	WB	Left	50	102	-52	64	-14	107	-57	73	-23
		Dual Thru	745	122	623	61	684	163	582	84	661
		Right	50	41	9	18	32	47	3	19	31
	NB	Left	50	47	3	23	27	107	-57	87	-37
		Thru-Thru/Right	200	74	126	45	155	118	82	99	101
	SB	Left	65	24	41	11	54	77	-12	44	21
		Dual Thru	650	71	579	29	621	72	578	45	605
		Right		71	-6	43	22	51	14	29	36

Intersection	Appr./Movement		Provided Storage (m)	AM Peak Hour				PM Peak Hour			
				95th %tile Queue		50th %tile Queue		95th %tile Queue		50th %tile Queue	
				Utilized	Available	Utilized	Available	Utilized	Available	Utilized	Available
Bryne Dr./ Harvie Road *Signalized*	EB	Left	60	10	50	2	58	18	42	2	58
		Dual Thru	300	68	232	44	256	102	198	70	230
		Right	60	8	52	2	58	4	56	1	59
	WB	Left	60	41	19	20	40	96	-36	69	-9
		Dual Thru	300	47	253	26	274	230	70	120	180
		Right	60	24	36	11	49	37	23	12	48
	NB	Left	60	11	49	4	56	28	32	15	45
		Dual Thru	300	28	272	15	285	51	249	33	267
		Right	60	20	40	10	50	49	11	26	34
	SB	Left	60	50	10	32	28	84	-24	80	-20
		Dual Thru	300	46	254	30	270	181	119	153	147
		Right	60	16	44	7	53	36	24	16	44

6 Conclusions and Recommendations

In consideration of the development previously analyzed within the Park Place Stage 2 TIS, inclusion of the proposed development of the Park Place North Lands, and the proposed residential development, the conclusions of the Traffic Impact Study are as follows:

- Consistent with the many past traffic studies conducted for Park Place since 2007, the weekday PM peak hour represents the design condition for assessing the overall traffic impact on the roadways and intersections in proximity to the site;
- Two development parcels previously contemplated for retail development are now proposed to be intensified through the provision of high-density residential dwellings and supporting ancillary retail-commercial uses within the South Lands. The proposed development is anticipated to generate approximately 175 and 366 vehicular trips under the AM and PM peak hours, respectively.

  In comparison to the original retail proposal, the proposed residential development would generate an additional 122 and 62 vehicle trips under the AM and PM peak hours, respectively.

  Vehicular access to the South Lands will remain as existing with no changes to the number or location of site accesses proposed.

  The overall impact of the proposed residential development on the adjacent transportation network is minor. The additional vehicular trips generated under the AM and PM peak hours are found not to trigger any improvements beyond those suggested to accommodate the background traffic forecasts. Effectively, the outcomes and findings of the Park Place Stage 2 (March 2020) TIS remain applicable;
- The estimated vehicular trip generation does not account for any modal split reductions. It is expected if a transit modal split reduction is applied there would be reduction of vehicular trips generated;
- The Mapleview Drive and Bayview Drive intersections are built out in terms of their physical design, but there are relatively minor improvements that could be made to increase their capacity. These include adjustments to signal phasing and timing (i.e., Maple view Drive/Park Place Boulevard-Costco Access);
- Due to several significant planned and under construction improvements to the road network adjacent to Park Place,

including the recently completed Harvie Road-Big Bay Point Road flyover of Highway 400 which provides an east-west alternative to the Mapleview Drive corridor, the modeling forecasts generated from the Park Place Stage 2 (March 2020) TIS were utilized as they accounted for the redistribution of traffic resulting from the planned transportation improvements;

- For the 2026 horizon year, the analysis of the PM peak hour showed significantly higher traffic volumes in the Harvie Road-Big Bay Point Road corridor (but within capacity) and that operations along the Mapleview Drive corridor would slightly improve due to reductions in the volume of key traffic movements (i.e., eastbound left turn movements to Park Place and some Highway 400 off ramp turning movements).

  With the provision of the Harvie Road-Big Bay Point Road flyover, diversion of traffic is noted. As motorists become more familiar with the improved transportation road network, the under utilized Harvie Road-Big Bay Point Road corridor will likely attract higher traffic volumes than those in the forecasts. The diversion of more peak period traffic to new alternative routes will also assist in maintaining Mapleview Drive corridor traffic volume demands within capacity;

- Relatively minor operational improvements as identified in the TIS could be implemented to maintain and/or improve peak hour conditions at several key intersections in the Mapleview Drive corridor. The aforementioned improvements are the same measures as identified from the Park Place Stage 2 (March 2020) TIS. The proposed residential development within the South Lands would not trigger the need for any additional improvements.

  Further, it is our understanding that the City of Barrie is intending to conduct a detailed study of the Mapleview Drive corridor to develop and evaluate shorter term operational and design alternatives that will better serve automobile, truck, transit, bicycle, and pedestrian travel demands within this corridor while complementing the longer term implementation of the MTO-recommended Diverging Diamond Interchange (DDI);

- For the 2031 and 2036 horizon years, by which several more larger transportation network improvements in addition to the Harvie Road-Big Bay Point Road flyover would be implemented, resulting in additional improvement in traffic operations; however, would be offset by background traffic growth.

  That is, due to a noticeable change in trip patterns in the model forecasts there is less reliance on the Mapleview Drive/Highway 400 interchange. However, accounting for background growth

there continues to be relatively significant traffic volume demands in the Mapleview Drive corridor. The operational results indicate that the corridor is forecast to operate within or near capacity; however, as motorists become more familiar with the improved overall transportation road network, the new underutilized transportation links and corridors will likely attract higher traffic volumes than those in the forecasts as evidenced in the data collected for the Harvie Road-Big Bay Point corridor;

- The analysis of the 2031 and 2036 traffic forecasts with the MTO and City-recommended DDI configuration at Mapleview Drive/Highway 400 and with the existing Diamond Interchange configuration confirmed that the DDI would represent an improvement in traffic operations at the ramp terminal intersections.

  It should be understood; however, that the improved operations at the interchange will not likely carry over to the adjacent Mapleview Drive intersections during the busiest conditions. The traffic reporting that was part of the MTO 2017 Transportation Environmental Study Report, where this design was identified as the preferred alternative, concluded that the PM peak hour traffic operations of adjacent intersections would be independent of the configuration of the interchange – i.e., the implementation of the DDI neither improves nor worsens the traffic operations at other intersections in the study area section of the Mapleview Drive corridor, it only improves ramp terminal operations;
- As timing for the implementation of the DDI is uncertain, the existing Diamond Interchange is forecast to provide acceptable traffic operations for the forecast 2031 and 2036 traffic conditions; and
- Future traffic conditions without the DDI at Highway 400 and Mapleview Drive are found to operate at acceptable conditions under the forecast 2031 and 2036 traffic conditions; however, operations would be improved under the DDI configuration.

The recommendations of the Traffic Impact Study are as follows:

- The proposed residential development within the Park Place South Lands should be approved, and this recommendation is supported by the following points:
  - Significant road network capacity has been provided adjacent to Park Place by the recent construction of the Harvie Road-Big Bay Point Road flyover of Highway 400.

Additional road network capacity will also be provided adjacent to Park Place by the Bryne Drive extension (southerly portion between Caplan Avenue and Harvie Road). Construction is anticipated to begin in 2022;

- Shorter term operational improvements identified in this study and those that will be determined through the City's upcoming Mapleview Drive corridor study that can be implemented in the Mapleview Drive corridor in conjunction with the continued development within Park Place; and
- The City's 2019 Transportation Master Plan (TMP) has identified several road network improvements that are anticipated to be implemented by 2031 including projects that will directly and indirectly benefit traffic flow to and from Park Place.

- Consistent with the MTO recommendation for implementing the DDI at Highway 400 and Mapleview Drive as well as the City's 2019 TMP recommendation for this same improvement to assist in accommodating future traffic forecasts, the DDI should be implemented as soon as practicable in order to realize the traffic operations and safety benefits to the interchange of this design compared to the existing Diamond Interchange configuration.

  Furthermore, as additional major external network improvements projects are completed (i.e., Essa interchange improvements, Bryne Drive extension – north and south portions, McKay interchange, Lockhart Road, etc.) interchange operations are anticipated to be improved.

  Notwithstanding, given the timing for implementation is uncertain the TIS identifies the existing Diamond Interchange configuration is forecast to operate acceptably up to the 2036 horizon year.

  It is recommended that MTO continue to monitor interchange ramp terminal volumes and associated operations along with the interchange off ramp queues.

Appendix A

Pre-Study Consultation Correspondence

Adrian Soo

From: Celeste Kitsemetry <Celeste.Kitsemetry@barrie.ca>
Sent: April 1, 2022 12:27 PM
To: Adrian Soo
Cc: Steve Bishop; Marisa Kay; Victoria McCrum; 'Ronald Richards'; Ministry of Transporation; Justin MacDonald; Brett Gratrix
Subject: RE: Barrie Park Place - Traffic Impact Study Terms of Reference

Follow Up Flag: Follow up
Flag Status: Flagged

Good afternoon, Adrian (et. al.)
Below, please find the updated comments from City of Barrie and MTO:

#	City of Barrie/MTO Comment **FEBRUARY 25, 2022**	PTSL Response **MARCH 11, 2022**	City of Barrie/MTO Comment **APRIL 1, 2022**
1	We agree with the proposal to do a TIS for the North Lands that does not include potential Residential development within the Retail Village (Residential proposal is early in planning process, and not approved)	Acknowledged.	---
2	However, the separate TIS for the Residential proposal should account for / include traffic generated from the North Lands.	Acknowledged.	---
3	The study area for both studies should include area bounded by Bayview/Big Bay Pt, Bayview/Mapleview, Mapleview/Bryne, Bryne/Harvie, and include assessment on Hwy 400 / Mapleview IC (with and without DDI, as proposed).	Acknowledged. The identified study area matches with our proposed, the exception being Bryne/Harvie. We will include this intersection for assessment. **We request/require outputs from the City's model for this future intersection (Bryne/Harvie) for the future horizons (2031 and 2041).** Regarding the assessment of Highway 400 / Mapleview IC (with and without DDI). It is not clear why the assessment without a DDI is now required for forecasting and analysis when: • The previous assessment only considered the DDI as the model forecasts	MTO > The previous assessment only looked at 2021 and 2031 horizon years for the Retail Village TIS. New traffic studies for Industrial and Residential developments will now include a 2026 horizon year, when there is good chance there will be no DDI (2031 model included DDI, however it is not programmed for construction); therefore, we still need the with and without DDI scenarios. COB > Model numbers provided to Paradigm by J. MacDonald March 29, 2022

		accounted for this future network improvement	
4	Depending on timing, one or both TISs' may precede the City's Mapleview Corridor Study.	Acknowledged.	---
5	The study should include the weekend peak period (Saturday mid-day)	It is not clear why a Saturday peak hour is now required for forecasting and analysis when: • All past studies were based on the weekday PM peak hour • Past counts showed that with few exceptions, the weekday PM peak hour traffic in our study area is higher • It is our understanding that the City of Barrie MMATMP "hybrid model" is for weekday AM and PM peak hours, and no Saturday model exists • A large part of the future development of the Park Place lands is for office and residential, which is not a high generator on a Saturday • The transportation studies for the Hewitt and Salem Secondary Plan areas on the east and west sides of Highway 400 were done for the AM and PM weekday peak hours only As detailed within the approved Park Place Stage 2 Traffic Impact Study (March 2020), Section 3.3 Traffic Volumes – a comparison of Saturday peak hour traffic volumes with the weekday PM peak was conducted per MTO's request to confirm that the latter peak hour represents a design condition. City collected PM peak hour traffic data for the Mapleview Drive corridor was compared to the Paradigm 2017 Saturday peak hour traffic data on the basis of volume entering each signalized intersection.	MTO & COB > Agree that Saturday analysis is not required.

		The comparison showed that the weekday PM peak hour volumes at most intersections were 4% to 23% higher than the Saturday peak hour volumes. The Mapleview Drive/Barrie View Drive intersection to the west side of Highway 400 was the only exception. The comparison of PM/Saturday volumes was provided as Appendix D for the March 2020 report. For reference we have included Appendix D.	
6	The planning horizons should be adjusted to account for some of the development lagging (i.e., not being fully built out as proposed). 2021 building of North Lands (Industrial Site) is not realistic, and should be revised perhaps to 2026. Year 2026 can be used as a horizon year for the North Lands, along with 2031 as the 5-year post-buildout for North Lands. A further planning horizon beyond 2031 is also recommended (i.e., 2036).	Acknowledged. Year 2026 will represent the build-out year for the North Lands and 2031 as the 5-year post build-out year for the North Lands. Noted. A further planning horizon of 2036 will be included as part of the analyses. **It is our understanding that the City's model has been updated recently and provides projections up to the 2041 horizon. We are requesting model outputs (similar exercise that was undertaken for the previous study).**	COB > Model numbers provided to Paradigm by J. MacDonald March 29, 2022
7	The Residential Site Plan shows less residential development than what was shown on the plan included in the Residential pre-con circulation. Neither the drawings nor Terms of Reference identify the number of residential units proposed. The Residential TIS should account for this, and include an ultimate / buildout Residential proposal (Residential phasing over a longer planning horizon is recommended, to at least year 2036).	The applicant has advised that the uptake of the proposed residential development (475 residential dwelling units) along with approximately 2,300 SM GFA of retail will be high and it is anticipated that longer phasing will not be required. The applicant is confident that full build-out and occupancy of the Residential proposal can occur well before 2031. Regardless, a further planning horizon of 2036 will be included as part of the analyses. **It is our understanding that the City's model has been updated recently and provides projections up to the 2041 horizon. We are**	MTO > Applicant is still only identifying the residential buildout as being 475 units, with buildout likely prior to 2031. The applicant should be asked to confirm how likely it is that the full buildout of future residential development within all of Park Place is only 475 units (or might there be a lot more in the future?). Applicant only intends to analyze what they have currently applied for, and are not accounting for potential additional, which is what we meant when suggesting they look

		requesting model outputs (similar exercise that was undertaken for the previous study).	at "buildout" scenario for Residential. COB > Model numbers provided to Paradigm by J. MacDonald March 29, 2022
8	Due to traffic volumes having been impacted by the pandemic, we agree with the proposal to use the previously developed background traffic forecasts, based on the City's model.	Acknowledged. We will utilize the previously developed traffic forecasts based on the City's model. To establish the Year 2026 volumes, we will prorate between the 2021 and 2031 traffic forecasts accordingly.	---

I hope this satisfies the comments/concerns. Feel free to reach out with any additional questions or to discuss.
Regards,
Celeste

Celeste Kitsemetry, RPP
Senior Planner
City of Barrie
Central Ontario's Premier Waterfront Community

Development Services
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From: Adrian Soo <asoo@ptsl.com>
Sent: Friday, March 11, 2022 1:10 PM
To: Celeste Kitsemetry <Celeste.Kitsemetry@barrie.ca>; Ministry of Transporation <Peter.Dorton@ontario.ca>; Justin MacDonald <Justin.MacDonald@barrie.ca>; Brett Gratrix <Brett.Gratrix@barrie.ca>
Cc: Steve Bishop <sbishop@nadg.com>; Marisa Kay <mkay@nadg.com>; Victoria McCrum <vmccrum@nadg.com>; 'Ronald Richards' <ron@rgrichards.com>
Subject: RE: Barrie Park Place - Traffic Impact Study Terms of Reference

Good Afternoon All,

The comments provided on the TIS Terms of Reference have been well received. Upon review and further discussion, our responses are noted below.

Please note that we have requested information (bolded for ease of identification). If contact information can be provided to follow-up on the data request, that would be greatly appreciated.

#	City of Barrie/MTO Comment	PTSL Response

1	We agree with the proposal to do a TIS for the North Lands that does not include potential Residential development within the Retail Village (Residential proposal is early in planning process, and not approved)	Acknowledged.
2	However, the separate TIS for the Residential proposal should account for / include traffic generated from the North Lands.	Acknowledged.
3	The study area for both studies should include area bounded by Bayview/Big Bay Pt, Bayview/Mapleview, Mapleview/Bryne, Bryne/Harvie, and include assessment on Hwy 400 / Mapleview IC (with and without DDI, as proposed).	Acknowledged. The identified study area matches with our proposed, the exception being Bryne/Harvie. We will include this intersection for assessment. **We request/require outputs from the City's model for this future intersection (Bryne/Harvie) for the future horizons (2031 and 2041).** Regarding the assessment of Highway 400 / Mapleview IC (with and without DDI). It is not clear why the assessment without a DDI is now required for forecasting and analysis when: • The previous assessment only considered the DDI as the model forecasts accounted for this future network improvement
4	Depending on timing, one or both TISs' may precede the City's Mapleview Corridor Study.	Acknowledged.
5	The study should include the weekend peak period (Saturday mid-day)	It is not clear why a Saturday peak hour is now required for forecasting and analysis when: • All past studies were based on the weekday PM peak hour • Past counts showed that with few exceptions, the weekday PM peak hour traffic in our study area is higher • It is our understanding that the City of Barrie MMATMP "hybrid model" is for weekday AM and PM peak hours, and no Saturday model exists • A large part of the future development of the Park Place lands is for office and residential, which is not a high generator on a Saturday • The transportation studies for the Hewitt and Salem Secondary Plan areas on the east and west sides of Highway 400 were done for the AM and PM weekday peak hours only As detailed within the approved Park Place Stage 2 Traffic Impact Study (March 2020), Section 3.3 Traffic Volumes – a comparison of Saturday peak hour traffic volumes with the weekday PM peak was conducted per

		MTO's request to confirm that the latter peak hour represents a design condition. City collected PM peak hour traffic data for the Mapleview Drive corridor was compared to the Paradigm 2017 Saturday peak hour traffic data on the basis of volume entering each signalized intersection. The comparison showed that the weekday PM peak hour volumes at most intersections were 4% to 23% higher than the Saturday peak hour volumes. The Mapleview Drive/Barrie View Drive intersection to the west side of Highway 400 was the only exception. The comparison of PM/Saturday volumes was provided as Appendix D for the March 2020 report. For reference we have included Appendix D.
6	The planning horizons should be adjusted to account for some of the development lagging (i.e., not being fully built out as proposed). 2021 building of North Lands (Industrial Site) is not realistic, and should be revised perhaps to 2026. Year 2026 can be used as a horizon year for the North Lands, along with 2031 as the 5-year post-buildout for North Lands. A further planning horizon beyond 2031 is also recommended (i.e., 2036).	Acknowledged. Year 2026 will represent the build-out year for the North Lands and 2031 as the 5-year post build-out year for the North Lands. Noted. A further planning horizon of 2036 will be included as part of the analyses. **It is our understanding that the City's model has been updated recently and provides projections up to the 2041 horizon. We are requesting model outputs (similar exercise that was undertaken for the previous study).**
7	The Residential Site Plan shows less residential development than what was shown on the plan included in the Residential pre-con circulation. Neither the drawings nor Terms of Reference identify the number of residential units proposed. The Residential TIS should account for this, and include an ultimate / buildout Residential proposal (Residential phasing over a longer planning horizon is recommended, to at least year 2036).	The applicant has advised that the uptake of the proposed residential development (475 residential dwelling units) along with approximately 2,300 SM GFA of retail will be high and it is anticipated that longer phasing will not be required. The applicant is confident that full build-out and occupancy of the Residential proposal can occur well before 2031. Regardless, a further planning horizon of 2036 will be included as part of the analyses. **It is our understanding that the City's model has been updated recently and provides projections up to the 2041 horizon. We are requesting model outputs (similar exercise that was undertaken for the previous study).**
8	Due to traffic volumes having been impacted by the pandemic, we agree with the proposal to use the previously developed background traffic forecasts, based on the City's model.	Acknowledged. We will utilize the previously developed traffic forecasts based on the City's model.

		To establish the Year 2026 volumes, we will prorate between the 2021 and 2031 traffic forecasts accordingly.

Regards,

Adrian Soo, P.Eng.
Senior Project Manager

Paradigm Transportation Solutions Limited
p: 416.479.9684 x509
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From: Celeste Kitsemetry <Celeste.Kitsemetry@barrie.ca>
Sent: February 25, 2022 1:10 PM
To: Adrian Soo <asoo@ptsl.com>; 'Ronald Richards' <ron@rgrichards.com>
Cc: Steve Bishop <sbishop@nadg.com>; Marisa Kay <mkay@nadg.com>; Victoria McCrum <vmccrum@nadg.com>; Ministry of Transporation <Peter.Dorton@ontario.ca>; Justin MacDonald <Justin.MacDonald@barrie.ca>; Brett Gratrix <Brett.Gratrix@barrie.ca>
Subject: Barrie Park Place - Traffic Impact Study Terms of Reference

Good afternoon.
Staff from the City and MTO have reviewed the proposed Terms of Reference for the 'North Lands' and 'Residential' TIS, and offer the comments attached.
Please feel free to contact the team if you have any questions or to further discuss the TIS requirements.
Regards,
Celeste

Celeste Kitsemetry, RPP
Senior Planner
City of Barrie
Central Ontario's Premier Waterfront Community

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From: Adrian Soo <asoo@ptsl.com>
Sent: Friday, January 7, 2022 10:15 AM
To: peter.dorton@ontario.ca; Celeste Kitsemetry <Celeste.Kitsemetry@barrie.ca>
Cc: Ronald Richards <ron@rgrichards.com>; Steve Bishop <sbishop@nadg.com>; Marisa Kay <mkay@nadg.com>; Victoria McCrum <vmccrum@nadg.com>
Subject: Barrie Park Place - Traffic Impact Study Terms of Reference

Good Morning Peter and Celeste,

It is my understanding that Ron Richards has been in contact to discuss the proposed developments (within the Park Place south lands and vacant north lands) by North American Development Group (NADG). It was advised that Terms of Reference (ToR) for the supporting traffic studies should be prepared for sign-off/approval.

Accordingly, please see the enclosed Terms of Reference technical scopes for the respective Traffic Impact Studies.

If there are any questions regarding the content, please do not hesitate to call or e-mail.

Regards,

Adrian Soo, P.Eng.
Senior Project Manager

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07 January 2022
Project: (210434)

Peter Dorton
Senior Project Manager
Highway Corridor Management Section – Central Region
Ministry of Transportation
159 Sir William Hearst Avenue, 7th Floor
Toronto ON M3M 0B7

Celeste Kitsemetry, RPP
Senior Planner
City of Barrie
70 Collier Street
Barrie ON L4M 4T5

Dear Peter and Celeste:

RE: PARK PLACE RESIDENTIAL AND NORTH LANDS DEVELOPMENT
RESIDENTIAL COMPONENT (SOUTH LANDS): D28-053-2021
EMPLOYMENT COMPONENT (NORTH LANDS): D28-102-2021

TRAFFIC IMPACT STUDY – TERMS OF REFERENCE

Introduction

Paradigm is providing these Traffic Impact Study (TIS) technical scopes for your review and sign-off/approval.

NADG is proposing two new developments at Park Place:

1. Construction of a residential development within the Park Place south lands (C4) as illustrated on the attached conceptual site plan. It is anticipated that a Zoning by-law amendment and a Site Plan Amendment will be required for the residential development. This application is a deviation from the approved Master Site Plan and the recent MTO (2020) approval of the updated TIS.

2. Development of the vacant north land for industrial purposes as shown on the 2nd attached conceptual site plan. This proposed development, together with the proposed car wash/convenience retail development at the SW corner of Bayview Drive and Big

Bay Point Road will constitute the “build-out” of the North Lands largely as anticipated by the approved Master Site Plan. The required applications in this case are site plan and a possible minor variance for parking.

While we are proposing to undertake these two studies simultaneously we expect that the proposed residential development will take longer to be finally approved. In this regard we are proposing to complete the “build-out” study for the north lands without incorporating the proposed residential development. The TIS for the residential development will, conversely, include the north lands proposed development.

Background

The Park Place Stage 2 Traffic Impact Study as authored by Paradigm (March 2020) was accepted by MTO in July 2020. It was noted the TIS confirmed to MTO’s satisfaction that highway improvements are not required as related to Park Place to the 2031 horizon year, provided that future applications for MTO Building and Land Use permits are in conformance with the land uses and building sizes depicted in Appendix A (Park Place Site Plans) of the TIS.

It was further noted that a Buildout TIS submission is still required for development of the North Lands and should be submitted in association with the first application to allow for development within the North Lands.

Approach/Methodology

Significant modelling work was previously undertaken to develop the future traffic forecasts. That is, model forecasts were utilized to determine the broader changes in the traffic patterns as related to future planned network improvements. A prime example would be the split of east-west traffic between Mapleview Drive and Harvie Road-Big Bay Point Road crossing over Highway 400.

Given the Park Place Stage 2 Traffic Impact Study has been approved and accepted, our proposed approach would be to build upon the previously completed work for consistency.

- **Proposed Industrial Development on the North Lands**
  - As previously indicated by MTO, a Full Build Out TIS (accounting for all development within the North Lands, as opposed to individual traffic studies for each application within the North Lands) will be required prior to any development thereon;
  - Our approach for the TIS would be to build upon the traffic forecasts developed within the Park Place Stage 2 Traffic Impact Study. Further rationale is provided and discussed below.

    Effectively, the site generated forecasts for the North Lands would be another layer of traffic. The same study area intersections would be analyzed and assessed.

    MTO to confirm the proposed approach is acceptable.

- **Proposed Residential Development within Park Place**
  - As related to the proposed residential development, our approach would be to update the Park Place lands site trips accordingly;
  - While we recognize the Harvie Road-Big Bay Point Road crossing over Highway 400 has been open and operational since June 2021, we have determined that utilizing the previously developed background traffic forecasts would be most applicable rather than collecting new data and developing new traffic forecasts. Our rationale is noted as follows:
    - The current on-going global pandemic has impacted travel demands and patterns significantly. Adding to this complication, there are many uncertainties whether traffic volumes and patterns will return to typical pre-pandemic conditions.
    - Cognisant of this, we undertook a data collection program in late September 2021/early October 2021 to assess traffic conditions within the study area to confirm whether traffic demands were still impacted by the pandemic or if typical conditions had returned.

      In summary it was identified the volumes collected in September 2021 were significantly lower than the base year counts collected in 2018. (approximately 10 – 20% lower when examining total volumes entering intersections). **Table 1** provides a volume comparison summary for information at select intersections.

      The exception would be volumes at the Bayview Drive/Big Bay Point Road intersection where increases are noted as a result of the new link providing an additional crossing of Highway 400.

      While it can be deduced that traffic is utilizing this new link, it is difficult to determine with confidence the percentage of traffic redistribution using the Mapleview Drive corridor and the new Harvie Road-Bay Point Point Road corridor. As such any future background traffic forecasts would be generated with low confidence.
    - This confirmed the most recent data collected would not provide for an accurate assessment and therefore would not be suitable as a starting point to account for the most recent network change.
  - Furthermore, the modelling work conducted also included for other major network improvements including but not limited to the expansion of Highway 400, and the Bryne Drive Extension.

    As such the previously developed background traffic forecasts based on the City's model would continue to be applicable for use.

    MTO to confirm the proposed approach is acceptable.

Technical Details

1. Similar to the previous March 2020 TIS, the studies will focus on the weekday AM and PM peak hours. Study areas would encompass all the same previous intersections.

2. The planning horizon assumptions for the purposes of the residential and North Lands TIS will be the same per the March 2020 TIS. Which are, 2021 (representing Park Place full build-out and full build-out of the North Lands) and 2031 representing 10-years from build-out. Residential build-out is anticipated for 2024 at the earliest

   As with the previous study, for the purposes of the TIS, no extended phasing of the Park Place development is being assumed since a later full build-out year would require extending the future planning horizons to some time beyond what has been considered in the TESR (2031) as well as in the transportation studies previously completed by adjacent developers (and reviewed by the City of Barrie) for the Hewitt and Salem Secondary Plan areas (2031).

3. As detailed above, future background traffic for the horizons will utilize the previously developed forecasts based on the modelling work conducted and accepted.

4. The existing and proposed land uses within Park Place will be confirmed via the most current Master Plan.

   As per the previous assessment, site trips for existing and proposed retail uses will be based on the Institute of Transportation Engineers (ITE) Trip Generation Manual trip equations for the Shopping Centre land use. ITE rates/equations will also be applied to the other types of proposed land uses based on the most logical Land Use category in the Trip Generation Manual.

5. Site generated trips will be distributed and assigned to the study area road network in consideration of both existing patterns and those evident from the forecasting model. The combination of background and site traffic will produce the total traffic forecasts for each horizon year.

6. The background and total traffic forecasts for each horizon year will be updated and analyzed accordingly using Synchro software. Measures of effectiveness (MOE) including volume-to-capacity (V/C) ratios, Level of Service (LOS), and queuing conditions will be reported.

   The Mapleview Drive ramp terminal intersections will be analyzed under two scenarios as in the previous assessment. The existing configuration and the recommended diverging diamond interchange (DDI) configuration.

   MTO to confirm the proposed technical details/scope is acceptable.

Reporting

Two separate traffic impact study documents will be generated:

- One to support the proposed residential development within Park Place; and
- One to support the proposed industrial development on the North Lands

TABLE 1: COMPARISON OF 2018 AND 2021 COUNTS

Intersection	Approach	Movement	AM				PM			
			2018	2021	Diff	% Diff	2018	2021	Diff	% Diff
Bayview Drive & Mapleview Drive	EB	Left	239	176	-63	-26%	268	232	-36	-13%
		Thru	986	892	-94	-10%	1469	1216	-253	-17%
		Right	424	382	-42	-10%	243	193	-50	-21%
	EB Approach		*1649*	*1450*	*-199*	*-12%*	*1980*	*1641*	*-339*	*-17%*
	WB	Left	38	32	-6	-16%	54	43	-11	-20%
		Thru	865	883	18	2%	1118	1017	-101	-9%
		Right	77	64	-13	-17%	87	121	34	39%
	WB Approach		*980*	*979*	*-1*	*0%*	*1259*	*1181*	*-78*	*-6%*
	NB	Left	253	202	-51	-20%	380	332	-48	-13%
		Thru	117	68	-49	-42%	275	200	-75	-27%
		Right	14	17	3	21%	55	48	-7	-13%
	NB Approach		*384*	*287*	*-97*	*-25%*	*710*	*580*	*-130*	*-18%*
	SB	Left	54	63	9	17%	138	130	-8	-6%
		Thru	134	133	-1	-1%	203	162	-41	-20%
		Right	295	166	-129	-44%	258	298	40	16%
	SB Approach		*483*	*362*	*-121*	*-25%*	*599*	*590*	*-9*	*-2%*
	Total Intersection		***3496***	***3078***	***-418***	***-12%***	***4548***	***3992***	***-556***	***-12%***
Bayview Drive & Big Bay Point Road	EB	Left	29	67	38	131%	27	84	57	211%
		Thru	281	416	135	48%	372	376	4	1%
		Right	104	204	100	96%	124	196	72	58%
	EB Approach		*414*	*687*	*273*	*66%*	*523*	*656*	*133*	*25%*
	WB	Left	185	89	-96	-52%	212	150	-62	-29%
		Thru	321	328	7	2%	462	550	88	19%
		Right	196	172	-24	-12%	94	108	14	15%
	WB Approach		*702*	*589*	*-113*	*-16%*	*768*	*808*	*40*	*5%*
	NB	Left	53	61	8	15%	227	313	86	38%
		Thru	262	152	-110	-42%	395	379	-16	-4%
		Right	76	52	-24	-32%	202	146	-56	-28%
	NB Approach		*391*	*265*	*-126*	*-32%*	*824*	*838*	*14*	*2%*
	SB	Left	111	110	-1	-1%	160	130	-30	-19%
		Thru	288	224	-64	-22%	333	260	-73	-22%
		Right	8	69	61	763%	37	114	77	208%
	SB Approach		*407*	*403*	*-4*	*-1%*	*530*	*504*	*-26*	*-5%*
	Total Intersection		***1914***	***1944***	***30***	***2%***	***2645***	***2806***	***161***	***6%***
Mapleview Drive & Highway 400 East Ramp Terminal (NB On-Off)	EB	Left	303	238	-65	-21%	727	535	-192	-26%
		Thru	1504	1301	-203	-13%	2162	1701	-461	-21%
	EB Approach		*1807*	*1539*	*-268*	*-15%*	*2889*	*2236*	*-653*	*-23%*
	WB	Thru	1105	916	-189	-17%	1812	1462	-350	-19%
		Right	489	481	-8	-2%	833	900	67	8%
	WB Approach		*1594*	*1397*	*-197*	*-12%*	*2645*	*2362*	*-283*	*-11%*
	NB	Left	210	222	12	6%	378	406	28	7%
		Right	437	463	26	6%	768	628	-140	-18%
	NB Approach		*647*	*685*	*38*	*6%*	*1146*	*1034*	*-112*	*-10%*
	Total Intersection		***4048***	***3621***	***-427***	***-11%***	***6680***	***5632***	***-1048***	***-16%***
Mapleview Drive & Highway 400 West Ramp Terminal (SB On-Off)	EB	Thru	1021	748	-273	-27%	1947	1533	-414	-21%
		Right	316	311	-5	-2%	248	294	46	19%
	EB Approach		*1337*	*1059*	*-278*	*-21%*	*2195*	*1827*	*-368*	*-17%*
	WB	Left	404	397	-7	-2%	418	388	-30	-7%
		Thru	911	717	-194	-21%	1772	1485	-287	-16%
	WB Approach		*1315*	*1114*	*-201*	*-15%*	*2190*	*1873*	*-317*	*-14%*
	SB	Left	786	771	-15	-2%	942	630	-312	-33%
		Right	689	507	-182	-26%	542	486	-56	-10%
	SB Approach		*1475*	*1278*	*-197*	*-13%*	*1484*	*1116*	*-368*	*-25%*
	Total Intersection		***4127***	***3451***	***-676***	***-16%***	***5869***	***4816***	***-1053***	***-18%***

Yours truly,

PARADIGM TRANSPORTATION SOLUTIONS LIMITED

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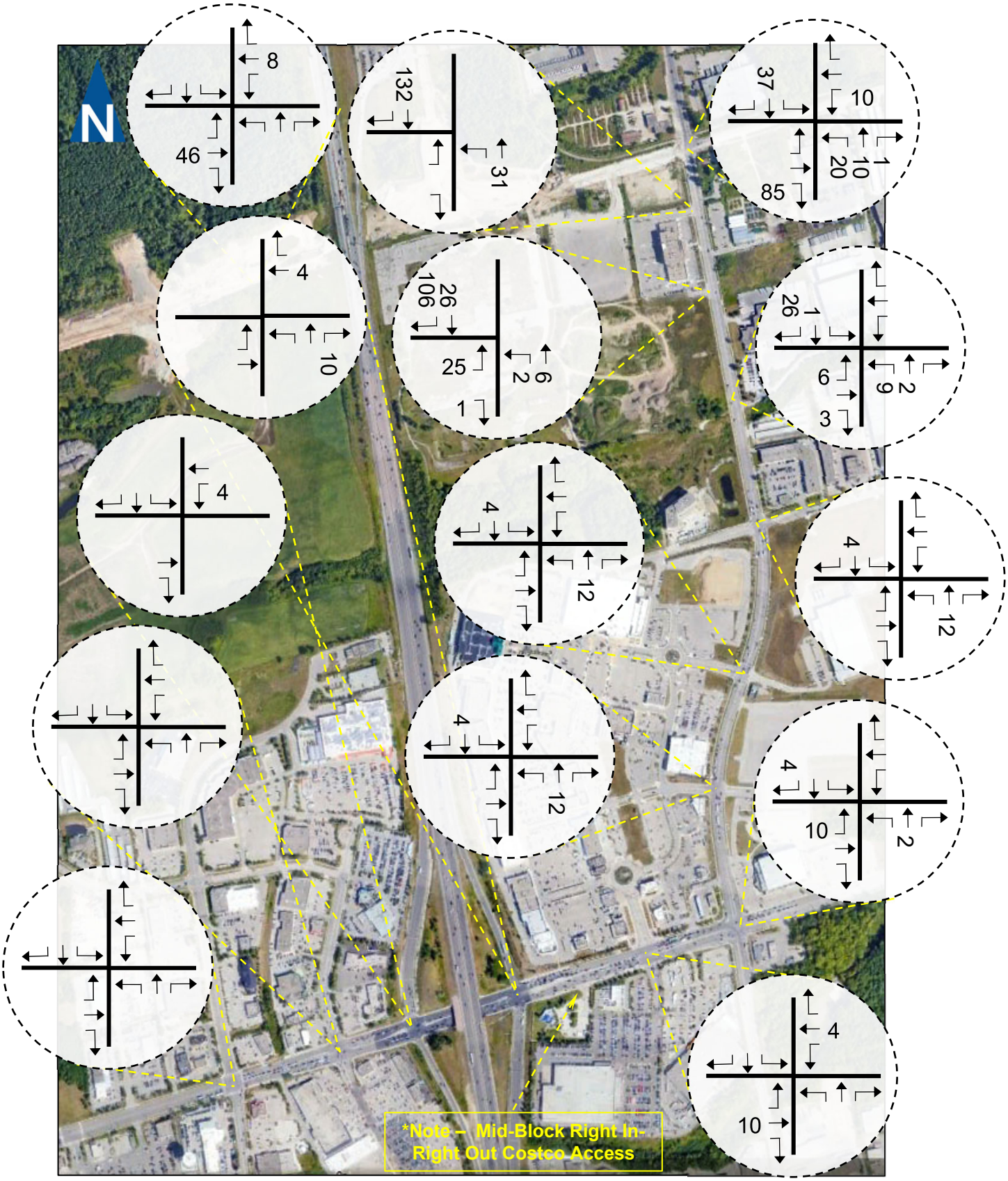
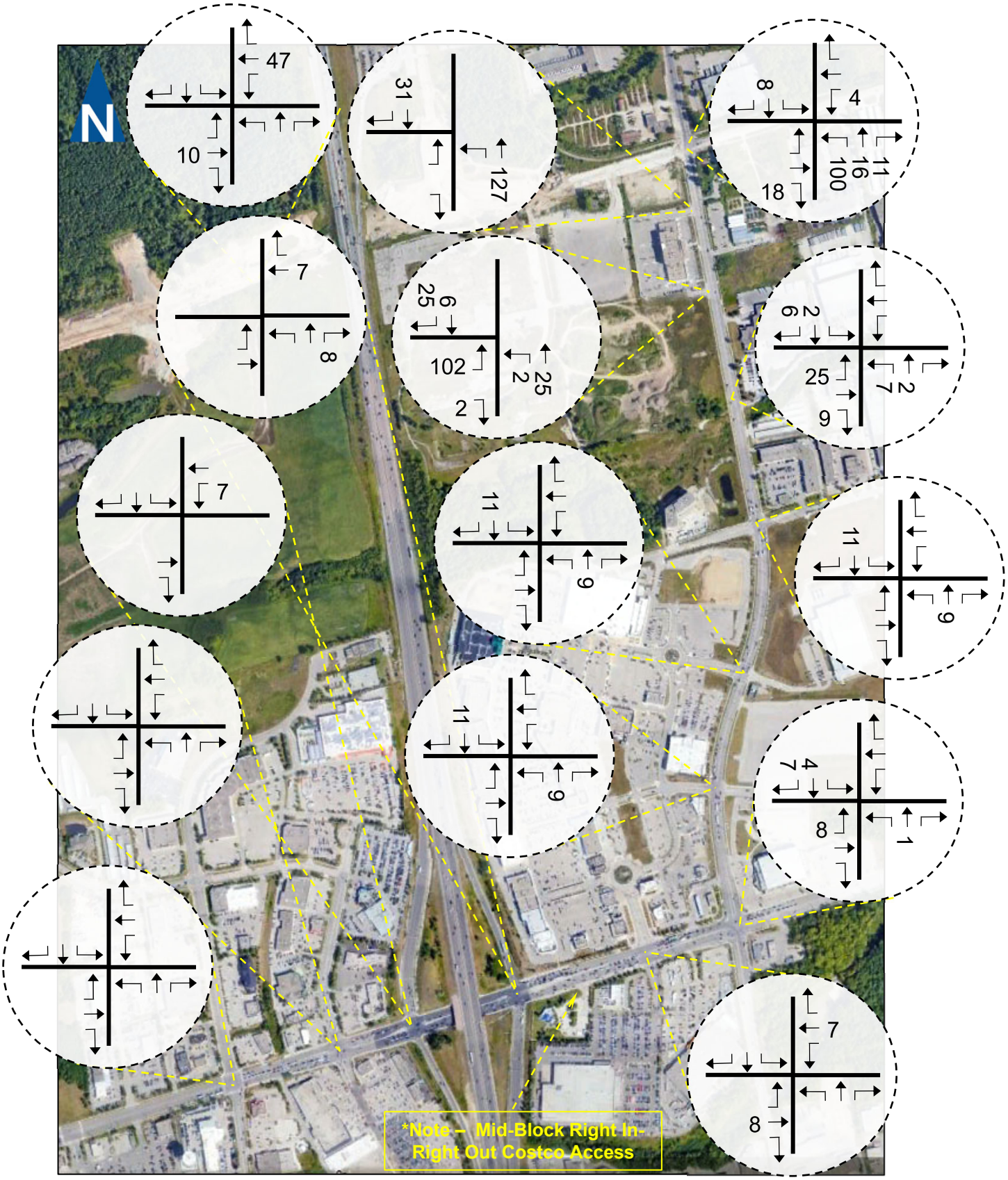
Appendix B

Industrial Development North Lands Site Traffic



Park Place North Lands Site Traffic AM Peak Hour

Figure 4.7



Park Place North Lands Site Traffic PM Peak Hour

Figure 4.8

Appendix C

2026 Background Synchro Analysis

Queues

210434

3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

2026 Future Total - AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	14	1071	395	1775	3	10	167	327	22
v/c Ratio	0.08	0.42	0.71	0.62	0.02	0.08	0.61	0.79	0.02
Control Delay	5.1	9.2	58.8	7.5	27.7	48.3	14.8	48.7	27.5
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	5.1	9.2	58.8	7.6	27.7	48.3	14.8	48.7	27.5
Queue Length 50th (m)	0.4	12.6	46.0	38.8	0.5	2.2	0.0	65.2	1.5
Queue Length 95th (m)	m1.2	16.2	m58.2	79.0	2.6	7.6	15.6	90.4	5.2
Internal Link Dist (m)		85.3		118.2		85.0			175.8
Turn Bay Length (m)	70.0		65.0		20.0			40.0	
Base Capacity (vph)	179	2557	633	2842	199	310	412	416	1001
Starvation Cap Reductn	0	0	0	219	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	0.08	0.42	0.62	0.68	0.02	0.03	0.41	0.79	0.02

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

210434

3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

2026 Future Total - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	1044	27	395	1380	395	3	10	167	327	18	4
Future Volume (vph)	14	1044	27	395	1380	395	3	10	167	327	18	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0	6.0	4.0	6.0	
Lane Util. Factor	1.00	0.86		0.97	0.91		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.99	1.00	
Frt	1.00	1.00		1.00	0.97		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	6036		3467	4815		1733	1900	1560	1742	3496	
Flt Permitted	0.10	1.00		0.95	1.00		0.74	1.00	1.00	0.54	1.00	
Satd. Flow (perm)	188	6036		3467	4815		1354	1900	1560	989	3496	
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)	14	1044	27	395	1380	395	3	10	167	327	18	4
RTOR Reduction (vph)	0	2	0	0	38	0	0	0	152	0	3	0
Lane Group Flow (vph)	14	1069	0	395	1737	0	3	10	15	327	19	0
Confl. Peds. (#/hr)	2					2	1		7	7		1
Heavy Vehicles (%)	0%	8%	3%	1%	4%	3%	4%	0%	1%	3%	0%	1%
Turn Type	pm+pt	NA		Prot	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2						8		8	4		
Actuated Green, G (s)	45.9	43.4		17.7	58.6		11.3	10.2	10.2	32.9	27.8	
Effective Green, g (s)	45.9	43.4		17.7	58.6		11.3	10.2	10.2	32.9	27.8	
Actuated g/C Ratio	0.42	0.39		0.16	0.53		0.10	0.09	0.09	0.30	0.25	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0	6.0	4.0	6.0	
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)	115	2381		557	2565		142	176	144	423	883	
v/s Ratio Prot	0.00	0.18		c0.11	c0.36		0.00	0.01		c0.13	0.01	
v/s Ratio Perm	0.05						0.00		0.01	c0.10		
v/c Ratio	0.12	0.45		0.71	0.68		0.02	0.06	0.11	0.77	0.02	
Uniform Delay, d1	19.1	24.5		43.7	18.8		44.4	45.5	45.7	33.4	30.9	
Progression Factor	0.44	0.38		1.22	0.43		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.6		3.3	1.2		0.1	0.1	0.3	8.5	0.0	
Delay (s)	8.8	9.8		56.5	9.2		44.4	45.6	46.1	41.9	30.9	
Level of Service	A	A		E	A		D	D	D	D	C	
Approach Delay (s)		9.8			17.8			46.0			41.2	
Approach LOS		A			B			D			D	

Intersection Summary

HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	77.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	1297	240	474	1413	720	757
v/c Ratio	0.71	0.42	0.95	0.48	0.72	0.88
Control Delay	30.0	6.9	44.7	10.3	38.8	45.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.0	6.9	44.7	10.3	38.8	45.7
Queue Length 50th (m)	85.9	15.0	94.9	88.8	72.4	82.2
Queue Length 95th (m)	97.6	m7.7	#148.7	76.6	93.5	109.8
Internal Link Dist (m)	118.2			168.8		
Turn Bay Length (m)		45.0	135.0		300.0	300.0
Base Capacity (vph)	1815	578	534	2931	1071	916
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	80	0	1
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.42	0.89	0.50	0.67	0.83

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)	0	1297	240	474	1413	0	0	0	0	720	0	757
Future Volume (vph)	0	1297	240	474	1413	0	0	0	0	720	0	757
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	4.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	1.00	0.91					0.97		0.88
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		6225	1538	1626	4940					3367		2733
Flt Permitted		1.00	1.00	0.11	1.00					0.95		1.00
Satd. Flow (perm)		6225	1538	190	4940					3367		2733
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	1297	240	474	1413	0	0	0	0	720	0	757
RTOR Reduction (vph)	0	0	130	0	0	0	0	0	0	0	0	48
Lane Group Flow (vph)	0	1297	110	474	1413	0	0	0	0	720	0	709
Heavy Vehicles (%)	0%	5%	5%	11%	5%	0%	0%	0%	0%	4%	0%	4%
Turn Type		NA	Perm	pm+pt	NA					Prot		Perm
Protected Phases		2		1	6					4		
Permitted Phases			2	6								4
Actuated Green, G (s)		32.1	32.1	65.3	65.3					32.7		32.7
Effective Green, g (s)		32.1	32.1	65.3	65.3					32.7		32.7
Actuated g/C Ratio		0.29	0.29	0.59	0.59					0.30		0.30
Clearance Time (s)		6.0	6.0	4.0	6.0					6.0		6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		3.0
Lane Grp Cap (vph)		1816	448	493	2932					1000		812
v/s Ratio Prot		0.21		c0.25	0.29					0.21		
v/s Ratio Perm			0.07	c0.32								c0.26
v/c Ratio		0.71	0.25	0.96	0.48					0.72		0.87
Uniform Delay, d1		34.8	29.7	30.9	12.7					34.6		36.7
Progression Factor		0.76	0.51	0.55	0.74					1.00		1.00
Incremental Delay, d2		2.1	1.2	27.6	0.5					2.5		10.2
Delay (s)		28.8	16.2	44.7	10.0					37.1		46.9
Level of Service		C	B	D	A					D		D
Approach Delay (s)		26.8			18.7			0.0			42.1	
Approach LOS		C			B			A			D	

Intersection Summary

HCM 2000 Control Delay	28.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	334	1683	1592	762	295	314
v/c Ratio	0.69	0.46	0.60	0.68	0.58	0.68
Control Delay	40.2	3.8	5.7	7.7	47.1	41.3
Queue Delay	0.0	0.2	0.0	1.1	0.0	0.0
Total Delay	40.2	4.0	5.7	8.8	47.1	41.3
Queue Length 50th (m)	23.0	2.1	17.8	9.6	32.6	30.3
Queue Length 95th (m)	32.7	11.3	m22.3	m44.3	43.8	44.4
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	527	3688	2669	1119	825	703
Starvation Cap Reductn	0	1056	0	160	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.64	0.60	0.79	0.36	0.45

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)	334	1683	0	0	1592	762	295	0	314	0	0	0
Future Volume (vph)	334	1683	0	0	1592	762	295	0	314	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0			6.0	6.0	6.0		6.0			
Lane Util. Factor	0.97	0.91			0.91	1.00	0.97		0.88			
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)	3213	5036			4893	1468	3242		2561			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3213	5036			4893	1468	3242		2561			
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	1683	0	0	1592	762	295	0	314	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	319	0	0	58	0	0	0
Lane Group Flow (vph)	334	1683	0	0	1592	443	295	0	256	0	0	0
Heavy Vehicles (%)	9%	3%	0%	0%	6%	10%	8%	0%	11%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Prot		Perm			
Protected Phases	5	2			6		8					
Permitted Phases						6			8			
Actuated Green, G (s)	16.6	80.6			60.0	60.0	17.4		17.4			
Effective Green, g (s)	16.6	80.6			60.0	60.0	17.4		17.4			
Actuated g/C Ratio	0.15	0.73			0.55	0.55	0.16		0.16			
Clearance Time (s)	4.0	6.0			6.0	6.0	6.0		6.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0			
Lane Grp Cap (vph)	484	3690			2668	800	512		405			
v/s Ratio Prot	c0.10	0.33			c0.33		0.09					
v/s Ratio Perm						0.30			c0.10			
v/c Ratio	0.69	0.46			0.60	0.55	0.58		0.63			
Uniform Delay, d1	44.3	5.9			16.8	16.3	42.9		43.3			
Progression Factor	0.79	0.56			0.29	2.42	1.00		1.00			
Incremental Delay, d2	3.0	0.3			0.5	1.5	1.6		3.2			
Delay (s)	37.8	3.6			5.3	40.8	44.5		46.5			
Level of Service	D	A			A	D	D		D			
Approach Delay (s)		9.3			16.8			45.5			0.0	
Approach LOS		A			B			D			A	

Intersection Summary

HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.5%	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)	293	1562	29	8	1967	76	223	30	21	10	165
v/c Ratio	0.51	0.51	0.03	0.03	0.92	0.11	0.56	0.14	0.15	0.07	0.60
Control Delay	64.9	4.8	0.0	6.0	22.8	0.2	51.3	25.6	49.0	46.8	17.0
Queue Delay	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.9	4.8	0.0	6.0	27.8	0.2	51.3	25.6	49.0	46.8	17.0
Queue Length 50th (m)	33.9	10.6	0.0	0.4	47.6	0.0	25.0	2.5	4.6	2.2	0.0
Queue Length 95th (m)	50.8	40.9	m0.0	m0.5	#216.7	m0.0	36.5	11.3	12.2	7.5	19.9
Internal Link Dist (m)		225.6			141.6			127.2		94.6	
Turn Bay Length (m)	160.0		175.0	50.0			50.0		60.0		
Base Capacity (vph)	572	3060	971	255	2127	719	1103	558	136	144	274
Starvation Cap Reductn	0	0	0	0	128	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	0.51	0.51	0.03	0.03	0.98	0.11	0.20	0.05	0.15	0.07	0.60

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)	293	1562	29	8	1967	76	223	12	18	21	10	165
Future Volume (vph)	293	1562	29	8	1967	76	223	12	18	21	10	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.91		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)	3367	4893	1476	1805	4848	1475	3467	1716		1805	1900	1599
Flt Permitted	0.95	1.00	1.00	0.15	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3367	4893	1476	288	4848	1475	3467	1716		1805	1900	1599
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)	293	1562	29	8	1967	76	223	12	18	21	10	165
RTOR Reduction (vph)	0	0	12	0	0	43	0	16	0	0	0	152
Lane Group Flow (vph)	293	1562	17	8	1967	33	223	14	0	21	10	13
Confl. Peds. (#/hr)	2		1	1		2			1	1		
Heavy Vehicles (%)	4%	6%	8%	0%	7%	8%	1%	0%	0%	0%	0%	1%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2	6		6						4
Actuated Green, G (s)	18.7	65.6	65.6	49.7	48.3	48.3	12.6	12.6		8.4	8.4	8.4
Effective Green, g (s)	18.7	65.6	65.6	49.7	48.3	48.3	12.6	12.6		8.4	8.4	8.4
Actuated g/C Ratio	0.17	0.60	0.60	0.45	0.44	0.44	0.11	0.11		0.08	0.08	0.08
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	572	2918	880	149	2128	647	397	196		137	145	122
v/s Ratio Prot	c0.09	0.32		0.00	c0.41		c0.06	0.01		c0.01	0.01	
v/s Ratio Perm			0.01	0.02		0.02						0.01
v/c Ratio	0.51	0.54	0.02	0.05	0.92	0.05	0.56	0.07		0.15	0.07	0.10
Uniform Delay, d1	41.5	13.2	9.1	16.6	29.1	17.7	46.1	43.5		47.5	47.2	47.3
Progression Factor	1.47	0.33	1.00	0.65	0.55	0.10	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	0.6	0.0	0.1	5.0	0.1	1.8	0.2		0.5	0.2	0.4
Delay (s)	61.8	5.0	9.1	10.9	21.0	1.9	47.9	43.6		48.0	47.4	47.7
Level of Service	E	A	A	B	C	A	D	D		D	D	D
Approach Delay (s)		13.9			20.2			47.4			47.7	
Approach LOS		B			C			D			D	

Intersection Summary

HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	73.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	374	826	400	71	1511	173	85	213	149	476
v/c Ratio	0.80	0.35	0.45	0.21	0.82	0.83	0.11	0.54	0.20	0.92
Control Delay	70.4	14.2	3.1	15.2	37.5	81.8	12.1	31.4	32.5	42.0
Queue Delay	0.0	0.0	0.3	0.0	1.1	0.0	0.0	0.0	0.0	0.2
Total Delay	70.4	14.2	3.4	15.2	38.5	81.8	12.1	31.4	32.5	42.2
Queue Length 50th (m)	38.1	24.6	5.2	7.1	118.4	20.2	2.4	34.4	14.0	53.0
Queue Length 95th (m)	#68.0	26.8	15.9	15.9	#162.0	#39.5	8.3	49.7	21.2	#99.5
Internal Link Dist (m)		141.6			238.0		219.7		226.0	
Turn Bay Length (m)	70.0		50.0	120.0		95.0		110.0		45.0
Base Capacity (vph)	479	2349	898	349	1835	208	968	398	981	602
Starvation Cap Reductn	0	0	139	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	136	0	0	0	0	6
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.35	0.53	0.20	0.89	0.83	0.09	0.54	0.15	0.80

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)	374	826	400	71	1402	109	173	27	58	213	149	476
Future Volume (vph)	374	826	400	71	1402	109	173	27	58	213	149	476
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3213	4988	1458	1718	4912		3019	3093		1626	3252	1417
Flt Permitted	0.95	1.00	1.00	0.33	1.00		0.95	1.00		0.60	1.00	1.00
Satd. Flow (perm)	3213	4988	1458	594	4912		3019	3093		1026	3252	1417
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)	374	826	400	71	1402	109	173	27	58	213	149	476
RTOR Reduction (vph)	0	0	219	0	8	0	0	46	0	0	0	190
Lane Group Flow (vph)	374	826	181	71	1503	0	173	39	0	213	149	286
Confl. Peds. (#/hr)	1		3	3		1						
Heavy Vehicles (%)	9%	4%	9%	5%	4%	9%	16%	15%	0%	11%	11%	14%
Turn Type	Prot	NA	Perm	pm+pt	NA		Prot	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)	16.0	49.9	49.9	45.7	39.8		7.6	22.8		38.0	26.6	26.6
Effective Green, g (s)	16.0	49.9	49.9	45.7	39.8		7.6	22.8		38.0	26.6	26.6
Actuated g/C Ratio	0.15	0.45	0.45	0.42	0.36		0.07	0.21		0.35	0.24	0.24
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
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)	467	2262	661	307	1777		208	641		416	786	342
v/s Ratio Prot	c0.12	0.17		0.01	c0.31		c0.06	0.01		c0.05	0.05	
v/s Ratio Perm			0.12	0.08						0.12		c0.20
v/c Ratio	0.80	0.37	0.27	0.23	0.85		0.83	0.06		0.51	0.19	0.84
Uniform Delay, d1	45.5	19.7	18.8	19.6	32.3		50.6	35.0		27.2	33.1	39.6
Progression Factor	1.28	0.67	0.70	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	8.5	0.4	0.9	0.4	5.2		23.7	0.0		1.1	0.1	16.2
Delay (s)	66.8	13.6	13.9	20.0	37.5		74.3	35.0		28.3	33.3	55.8
Level of Service	E	B	B	B	D		E	D		C	C	E
Approach Delay (s)		26.1			36.7			61.4			44.8	
Approach LOS		C			D			E			D	

Intersection Summary

HCM 2000 Control Delay	35.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	60	14	5	54	457	6	839
v/c Ratio	0.18	0.11	0.01	0.12	0.17	0.01	0.37
Control Delay	11.8	36.8	0.0	3.9	4.9	3.7	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.8	36.8	0.0	3.9	4.9	3.7	8.6
Queue Length 50th (m)	0.0	2.4	0.0	1.7	9.7	0.3	35.6
Queue Length 95th (m)	6.1	8.0	0.0	6.8	31.8	1.5	64.8
Internal Link Dist (m)	115.4		50.9		226.0		199.1
Turn Bay Length (m)				70.0		50.0	
Base Capacity (vph)	737	126	768	451	2636	781	2254
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.11	0.01	0.12	0.17	0.01	0.37

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	0	29	14	0	5	54	440	17	6	795	44
Future Volume (vph)	31	0	29	14	0	5	54	440	17	6	795	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor		0.95		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.93		1.00	0.85		1.00	0.99		1.00	0.99	
Flt Protected		0.97		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3127		1203	1615		1517	3394		1805	3185	
Flt Permitted		0.82		0.47	1.00		0.29	1.00		0.49	1.00	
Satd. Flow (perm)		2644		599	1615		468	3394		928	3185	
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)	31	0	29	14	0	5	54	440	17	6	795	44
RTOR Reduction (vph)	0	55	0	0	4	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	5	0	14	1	0	54	456	0	6	837	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	1%	0%	8%	50%	0%	0%	19%	6%	0%	0%	13%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		7.8		13.1	13.1		77.2	71.9		69.1	67.8	
Effective Green, g (s)		7.8		13.1	13.1		77.2	71.9		69.1	67.8	
Actuated g/C Ratio		0.08		0.13	0.13		0.75	0.70		0.68	0.66	
Clearance Time (s)		6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		201		84	206		408	2385		637	2110	
v/s Ratio Prot				c0.00	0.00		c0.01	0.13		0.00	c0.26	
v/s Ratio Perm		0.00		c0.02			0.09			0.01		
v/c Ratio		0.02		0.17	0.00		0.13	0.19		0.01	0.40	
Uniform Delay, d1		43.7		39.4	38.9		3.7	5.2		5.4	7.9	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.0		0.9	0.0		0.1	0.2		0.0	0.6	
Delay (s)		43.8		40.4	38.9		3.8	5.4		5.4	8.5	
Level of Service		D		D	D		A	A		A	A	
Approach Delay (s)		43.8			40.0			5.2			8.4	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	102.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	WBL	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	35	23	4	46	430	4	867
v/c Ratio	0.16	0.06	0.03	0.08	0.15	0.00	0.34
Control Delay	37.5	0.3	45.0	3.3	4.4	3.5	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.5	0.3	45.0	3.3	4.4	3.5	7.1
Queue Length 50th (m)	6.1	0.0	0.7	1.5	9.2	0.2	37.0
Queue Length 95th (m)	14.9	0.0	4.5	5.9	30.1	1.2	67.0
Internal Link Dist (m)					199.1		252.7
Turn Bay Length (m)	25.0			70.0		70.0	
Base Capacity (vph)	230	454	157	589	2810	856	2548
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.05	0.03	0.08	0.15	0.00	0.34

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	0	23	4	0	0	46	430	0	4	819	48
Future Volume (vph)	35	0	23	4	0	0	46	430	0	4	819	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		6.0	4.0			4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00		1.00	1.00			1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Frt	1.00		0.85	1.00			1.00	1.00		1.00	0.99	
Flt Protected	0.95		1.00	0.95			0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1687		961	1805			1805	3406		1805	3271	
Flt Permitted	0.95		1.00	0.00			0.29	1.00		0.50	1.00	
Satd. Flow (perm)	1687		961	0			560	3406		953	3271	
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)	35	0	23	4	0	0	46	430	0	4	819	48
RTOR Reduction (vph)	0	0	22	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	35	0	1	4	0	0	46	430	0	4	865	0
Confl. Peds. (#/hr)	1											
Heavy Vehicles (%)	7%	0%	68%	0%	0%	0%	0%	6%	0%	0%	10%	0%
Turn Type	pm+pt		Perm	pm+pt			pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	12.8		5.6	1.2			77.9	73.9		72.3	71.1	
Effective Green, g (s)	12.8		5.6	1.2			77.9	73.9		72.3	71.1	
Actuated g/C Ratio	0.13		0.05	0.01			0.76	0.73		0.71	0.70	
Clearance Time (s)	4.0		6.0	4.0			4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0			3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	211		52	21			476	2470		686	2282	
v/s Ratio Prot	c0.02			0.00			c0.00	0.13		0.00	c0.26	
v/s Ratio Perm			0.00				0.07			0.00		
v/c Ratio	0.17		0.02	0.19			0.10	0.17		0.01	0.38	
Uniform Delay, d1	39.8		45.6	49.9			3.2	4.4		4.3	6.3	
Progression Factor	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4		0.2	4.4			0.1	0.2		0.0	0.5	
Delay (s)	40.2		45.8	54.3			3.3	4.6		4.3	6.8	
Level of Service	D		D	D			A	A		A	A	
Approach Delay (s)		42.4			54.3			4.4			6.8	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	101.9	Sum of lost time (s)	20.0
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	30	23	17	178	29	394	63	868
v/c Ratio	0.15	0.05	0.07	0.30	0.11	0.19	0.09	0.41
Control Delay	34.2	0.2	32.9	1.3	5.8	9.8	5.1	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.2	0.2	32.9	1.3	5.8	9.8	5.1	11.0
Queue Length 50th (m)	5.1	0.0	2.9	0.0	1.7	19.8	3.7	52.2
Queue Length 95th (m)	13.0	0.0	8.7	0.0	4.6	29.6	8.1	71.1
Internal Link Dist (m)				203.0		252.7		204.9
Turn Bay Length (m)	50.0	50.0	30.0		70.0		65.0	
Base Capacity (vph)	226	622	262	704	293	2103	688	2121
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	0.13	0.04	0.06	0.25	0.10	0.19	0.09	0.41

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	0	23	17	0	178	29	393	1	63	832	36
Future Volume (vph)	30	0	23	17	0	178	29	393	1	63	832	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00		1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00		0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00		0.85	1.00	0.85		1.00	1.00		1.00	0.99	
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805		1593	1734	1346		1031	3404		1624	3301	
Flt Permitted	0.35		1.00	0.76	1.00		0.30	1.00		0.51	1.00	
Satd. Flow (perm)	663		1593	1382	1346		321	3404		867	3301	
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)	30	0	23	17	0	178	29	393	1	63	832	36
RTOR Reduction (vph)	0	0	20	0	159	0	0	0	0	0	2	0
Lane Group Flow (vph)	30	0	3	17	19	0	29	394	0	63	866	0
Confl. Peds. (#/hr)			1	1			5		4	4		5
Heavy Vehicles (%)	0%	0%	0%	4%	0%	20%	75%	6%	4%	11%	9%	0%
Turn Type	pm+pt		Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	16.9		12.5	13.5	10.8		65.6	61.5		68.6	63.0	
Effective Green, g (s)	16.9		12.5	13.5	10.8		65.6	61.5		68.6	63.0	
Actuated g/C Ratio	0.17		0.12	0.13	0.11		0.64	0.60		0.67	0.62	
Clearance Time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	158		194	191	142		234	2046		622	2032	
v/s Ratio Prot	c0.01			0.00	0.01		0.00	0.12		c0.01	c0.26	
v/s Ratio Perm	c0.02		0.00	0.01			0.07			0.06		
v/c Ratio	0.19		0.01	0.09	0.13		0.12	0.19		0.10	0.43	
Uniform Delay, d1	36.4		39.5	38.9	41.5		7.0	9.2		5.8	10.2	
Progression Factor	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6		0.0	0.2	0.4		0.2	0.2		0.1	0.7	
Delay (s)	37.0		39.5	39.1	41.9		7.2	9.4		5.9	10.9	
Level of Service	D		D	D	D		A	A		A	B	
Approach Delay (s)		38.1			41.7			9.3			10.6	
Approach LOS		D			D			A			B	

Intersection Summary

HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	102.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	0	3	12	0	5	9	527	47	12	768	26
Future Volume (Veh/h)	6	0	3	12	0	5	9	527	47	12	768	26
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	6	0	3	12	0	5	9	527	47	12	768	26
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								229				
pX, platoon unblocked	0.99	0.99		0.99	0.99	0.99				0.99		
vC, conflicting volume	1092	1397	397	980	1386	287	794			574		
vC1, stage 1 conf vol	805	805		568	568							
vC2, stage 2 conf vol	286	592		411	818							
vCu, unblocked vol	1067	1376	397	954	1366	252	794			543		
tC, single (s)	7.5	6.5	6.9	8.3	6.5	6.9	4.1			4.2		
tC, 2 stage (s)	6.5	5.5		7.3	5.5							
tF (s)	3.5	4.0	3.3	3.9	4.0	3.3	2.2			2.3		
p0 queue free %	98	100	100	96	100	99	99			99		
cM capacity (veh/h)	318	323	602	333	320	744	823			982		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	9	17	9	351	223	12	512	282
Volume Left	6	12	9	0	0	12	0	0
Volume Right	3	5	0	0	47	0	0	26
cSH	378	398	823	1700	1700	982	1700	1700
Volume to Capacity	0.02	0.04	0.01	0.21	0.13	0.01	0.30	0.17
Queue Length 95th (m)	0.6	1.1	0.3	0.0	0.0	0.3	0.0	0.0
Control Delay (s)	14.8	14.5	9.4	0.0	0.0	8.7	0.0	0.0
Lane LOS	B	B	A			A		
Approach Delay (s)	14.8	14.5	0.1			0.1		
Approach LOS	B	B						

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	32.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	27	25	102	434	781	113
Future Volume (Veh/h)	27	25	102	434	781	113
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	27	25	102	434	781	113
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)					276	
pX, platoon unblocked						
vC, conflicting volume	1258	447	894			
vC1, stage 1 conf vol	838					
vC2, stage 2 conf vol	421					
vCu, unblocked vol	1258	447	894			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	96	87			
cM capacity (veh/h)	336	564	767			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	27	25	102	217	217	521	373
Volume Left	27	0	102	0	0	0	0
Volume Right	0	25	0	0	0	0	113
cSH	336	564	767	1700	1700	1700	1700
Volume to Capacity	0.08	0.04	0.13	0.13	0.13	0.31	0.22
Queue Length 95th (m)	2.1	1.1	3.7	0.0	0.0	0.0	0.0
Control Delay (s)	16.6	11.7	10.4	0.0	0.0	0.0	0.0
Lane LOS	C	B	B				
Approach Delay (s)	14.3		2.0			0.0	
Approach LOS	B						

Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	44.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	6	25	426	876	26
Future Volume (Veh/h)	9	6	25	426	876	26
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	9	6	25	426	876	26
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)					122	
pX, platoon unblocked	0.97	0.97	0.97			
vC, conflicting volume	1152	451	902			
vC1, stage 1 conf vol	889					
vC2, stage 2 conf vol	263					
vCu, unblocked vol	1085	359	826			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	99	97			
cM capacity (veh/h)	363	621	785			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	15	25	213	213	584	318
Volume Left	9	25	0	0	0	0
Volume Right	6	0	0	0	0	26
cSH	436	785	1700	1700	1700	1700
Volume to Capacity	0.03	0.03	0.13	0.13	0.34	0.19
Queue Length 95th (m)	0.9	0.8	0.0	0.0	0.0	0.0
Control Delay (s)	13.6	9.7	0.0	0.0	0.0	0.0
Lane LOS	B	A				
Approach Delay (s)	13.6	0.5			0.0	
Approach LOS	B					

Intersection Summary				
Average Delay		0.3		
Intersection Capacity Utilization		35.0%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	186	572	441	245	557	215	103	325	52	214	176
v/c Ratio	0.46	0.51	0.63	0.57	0.48	0.34	0.25	0.31	0.13	0.22	0.38
Control Delay	18.4	31.5	15.2	20.2	29.4	10.5	22.5	28.3	21.1	30.1	7.3
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	18.4	31.5	15.2	20.2	29.4	10.5	22.5	28.3	21.1	30.1	7.3
Queue Length 50th (m)	21.4	53.1	26.5	29.2	50.1	9.8	14.0	27.1	6.8	18.7	0.0
Queue Length 95th (m)	35.0	74.2	65.5	45.3	69.3	29.1	27.2	42.0	15.7	30.2	17.2
Internal Link Dist (m)		843.7			279.6			97.5		104.6	
Turn Bay Length (m)	25.0		25.0	40.0		25.0	100.0		40.0		50.0
Base Capacity (vph)	449	1401	801	487	1469	759	417	1034	392	978	458
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	0.41	0.41	0.55	0.50	0.38	0.28	0.25	0.31	0.13	0.22	0.38

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	186	572	441	245	557	215	103	261	64	52	214	176
Future Volume (vph)	186	572	441	245	557	215	103	261	64	52	214	176
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		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)	1641	3406	1538	1736	3343	1538	1595	3271		1610	3374	1152
Flt Permitted	0.37	1.00	1.00	0.31	1.00	1.00	0.59	1.00		0.55	1.00	1.00
Satd. Flow (perm)	640	3406	1538	569	3343	1538	990	3271		932	3374	1152
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	572	441	245	557	215	103	261	64	52	214	176
RTOR Reduction (vph)	0	0	193	0	0	98	0	17	0	0	0	124
Lane Group Flow (vph)	186	572	248	245	557	117	103	308	0	52	214	52
Confl. Peds. (#/hr)							3		2	2		3
Heavy Vehicles (%)	10%	6%	5%	4%	8%	5%	13%	7%	6%	12%	7%	38%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	46.9	35.0	35.0	50.9	37.0	37.0	40.3	33.3		37.3	31.8	31.8
Effective Green, g (s)	46.9	35.0	35.0	50.9	37.0	37.0	40.3	33.3		37.3	31.8	31.8
Actuated g/C Ratio	0.44	0.32	0.32	0.47	0.34	0.34	0.37	0.31		0.35	0.30	0.30
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	6.0
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)	389	1106	499	419	1148	528	409	1011		357	996	340
v/s Ratio Prot	0.05	0.17		c0.08	0.17		c0.02	c0.09		0.01	0.06	
v/s Ratio Perm	0.16		0.16	c0.20		0.08	0.08			0.04		0.05
v/c Ratio	0.48	0.52	0.50	0.58	0.49	0.22	0.25	0.31		0.15	0.21	0.15
Uniform Delay, d1	19.6	29.5	29.3	18.2	27.8	25.1	22.6	28.4		23.8	28.6	28.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.9	0.4	0.8	2.1	0.3	0.2	0.3	0.8		0.2	0.5	1.0
Delay (s)	20.5	29.9	30.0	20.3	28.2	25.3	22.9	29.2		24.0	29.1	29.0
Level of Service	C	C	C	C	C	C	C	C		C	C	C
Approach Delay (s)		28.5			25.7			27.6			28.4	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	107.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	85.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	58	1076	382	1006	70	114	21	137
v/c Ratio	0.16	0.48	0.70	0.33	0.32	0.24	0.10	0.38
Control Delay	8.9	22.6	40.5	3.7	39.9	14.7	35.5	29.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.9	22.6	40.5	3.7	39.9	14.7	35.5	29.4
Queue Length 50th (m)	3.4	61.9	43.6	7.7	13.1	1.9	3.8	8.4
Queue Length 95th (m)	7.4	84.5	92.5	14.4	25.8	11.1	10.7	18.3
Internal Link Dist (m)		279.4		63.9		107.8		187.7
Turn Bay Length (m)	60.0		25.0		45.0		50.0	
Base Capacity (vph)	373	2255	566	3065	217	772	217	850
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	0.16	0.48	0.67	0.33	0.32	0.15	0.10	0.16

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	971	105	382	921	85	70	20	94	21	75	62
Future Volume (vph)	58	971	105	382	921	85	70	20	94	21	75	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.88		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	4873		1752	4835		1656	2860		1570	3275	
Flt Permitted	0.27	1.00		0.18	1.00		0.53	1.00		0.68	1.00	
Satd. Flow (perm)	518	4873		331	4835		918	2860		1123	3275	
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)	58	971	105	382	921	85	70	20	94	21	75	62
RTOR Reduction (vph)	0	10	0	0	7	0	0	81	0	0	55	0
Lane Group Flow (vph)	58	1066	0	382	999	0	70	33	0	21	82	0
Confl. Peds. (#/hr)			5	5								
Heavy Vehicles (%)	0%	5%	2%	3%	6%	5%	9%	4%	12%	15%	5%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	54.0	48.3		76.1	66.4		21.0	14.9		14.8	11.8	
Effective Green, g (s)	54.0	48.3		76.1	66.4		21.0	14.9		14.8	11.8	
Actuated g/C Ratio	0.49	0.44		0.69	0.60		0.19	0.14		0.13	0.11	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	320	2139		536	2918		216	387		163	351	
v/s Ratio Prot	0.01	0.22		c0.15	0.21		c0.02	0.01		0.00	0.02	
v/s Ratio Perm	0.08			c0.34			c0.04			0.01		
v/c Ratio	0.18	0.50		0.71	0.34		0.32	0.08		0.13	0.23	
Uniform Delay, d1	14.7	22.2		14.3	10.9		37.6	41.6		41.8	45.0	
Progression Factor	1.00	1.00		2.98	0.34		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.8		3.5	0.3		0.9	0.1		0.4	0.3	
Delay (s)	15.0	23.0		46.2	3.9		38.5	41.7		42.1	45.3	
Level of Service	B	C		D	A		D	D		D	D	
Approach Delay (s)		22.6			15.5			40.5			44.9	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	21.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	75.3%	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)	6	396	7	49	201	147	10	105	97	105	252	77
v/c Ratio	0.01	0.26	0.01	0.12	0.13	0.19	0.02	0.06	0.12	0.18	0.15	0.10
Control Delay	19.7	22.3	0.0	21.6	20.7	3.9	17.5	17.8	3.9	19.6	18.7	4.2
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	19.7	22.3	0.0	21.6	20.7	3.9	17.5	17.8	3.9	19.6	18.7	4.2
Queue Length 50th (m)	0.8	32.3	0.0	7.2	15.4	0.0	1.3	7.3	0.0	14.8	18.4	0.0
Queue Length 95th (m)	3.5	44.0	0.2	15.7	23.4	12.1	4.5	12.6	9.4	26.5	26.8	8.5
Internal Link Dist (m)		272.9			843.7			269.3			198.7	
Turn Bay Length (m)	60.0		60.0	60.0		60.0	60.0		60.0	60.0		60.0
Base Capacity (vph)	505	1533	701	394	1533	769	518	1651	790	596	1651	779
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	0.01	0.26	0.01	0.12	0.13	0.19	0.02	0.06	0.12	0.18	0.15	0.10

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	396	7	49	201	147	10	105	97	105	252	77
Future Volume (vph)	6	396	7	49	201	147	10	105	97	105	252	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	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)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.63	1.00	1.00	0.49	1.00	1.00	0.60	1.00	1.00	0.69	1.00	1.00
Satd. Flow (perm)	1165	3539	1583	912	3539	1583	1110	3539	1583	1277	3539	1583
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)	6	396	7	49	201	147	10	105	97	105	252	77
RTOR Reduction (vph)	0	0	4	0	0	83	0	0	52	0	0	41
Lane Group Flow (vph)	6	396	3	49	201	64	10	105	45	105	252	36
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	52.0	52.0	52.0	52.0	52.0	52.0	56.0	56.0	56.0	56.0	56.0	56.0
Effective Green, g (s)	52.0	52.0	52.0	52.0	52.0	52.0	56.0	56.0	56.0	56.0	56.0	56.0
Actuated g/C Ratio	0.43	0.43	0.43	0.43	0.43	0.43	0.47	0.47	0.47	0.47	0.47	0.47
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Grp Cap (vph)	504	1533	685	395	1533	685	518	1651	738	595	1651	738
v/s Ratio Prot		c0.11			0.06			0.03			0.07	
v/s Ratio Perm	0.01		0.00	0.05		0.04	0.01		0.03	c0.08		0.02
v/c Ratio	0.01	0.26	0.00	0.12	0.13	0.09	0.02	0.06	0.06	0.18	0.15	0.05
Uniform Delay, d1	19.4	21.7	19.3	20.4	20.4	20.1	17.2	17.6	17.6	18.6	18.4	17.5
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	0.0	0.4	0.0	0.6	0.2	0.3	0.1	0.1	0.2	0.6	0.2	0.1
Delay (s)	19.4	22.1	19.3	21.0	20.6	20.3	17.3	17.7	17.7	19.2	18.6	17.6
Level of Service	B	C	B	C	C	C	B	B	B	B	B	B
Approach Delay (s)		22.0			20.6			17.7			18.6	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	42.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	B38	B38	WB	WB	WB	WB	WB
Directions Served	L	T	T	T	TR	T	T	L	L	T	T	TR
Maximum Queue (m)	14.9	69.7	72.9	55.3	70.8	4.8	3.2	71.0	76.8	81.2	89.4	103.1
Average Queue (m)	3.6	22.7	28.4	18.7	26.2	0.2	0.1	38.0	45.4	32.5	38.1	53.8
95th Queue (m)	11.3	52.4	59.0	43.6	55.3	3.4	2.3	60.6	66.9	60.4	69.7	87.8
Link Distance (m)		86.5	86.5	86.5	86.5	66.0	66.0			114.0	114.0	114.0
Upstream Blk Time (%)		0	0	0						0		0
Queuing Penalty (veh)		0	0	0						0		1
Storage Bay Dist (m)	70.0							65.0	65.0			
Storage Blk Time (%)		0						0	1	0		
Queuing Penalty (veh)		0						2	6	0		

Intersection: 3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

Movement	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR
Maximum Queue (m)	8.8	12.7	42.3	47.4	112.9	46.8
Average Queue (m)	0.8	3.1	19.3	44.5	52.7	4.6
95th Queue (m)	4.7	10.4	33.7	53.3	115.7	24.7
Link Distance (m)		85.8	85.8		180.4	180.4
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)	20.0			40.0		
Storage Blk Time (%)		0		36	0	
Queuing Penalty (veh)		0		3	0	

Intersection: 6: Mapleview Drive W & Highway 400 SB Off-Ramp

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	T	R	L	T	T	T	L	L	R
Maximum Queue (m)	119.4	118.8	113.4	108.0	67.5	144.3	109.7	75.9	76.6	293.5	335.3	309.7
Average Queue (m)	61.7	72.9	57.0	48.5	17.2	67.2	37.5	30.3	39.8	254.9	279.0	199.9
95th Queue (m)	112.6	116.2	98.6	84.6	49.6	118.6	76.2	55.8	64.4	354.6	396.6	415.9
Link Distance (m)	114.0	114.0	114.0	114.0			168.4	168.4	168.4		326.9	326.9
Upstream Blk Time (%)	0	1	0	0			0				32	16
Queuing Penalty (veh)	2	4	0	0			0				0	0
Storage Bay Dist (m)					45.0	135.0				300.0		
Storage Blk Time (%)				9	0	1				6	35	11
Queuing Penalty (veh)				21	1	2				22	126	41

Intersection: 6: Mapleview Drive W & Highway 400 SB Off-Ramp

Movement	SB	B36	B36
Directions Served	R	T	T
Maximum Queue (m)	274.9	119.6	114.1
Average Queue (m)	144.2	66.2	65.5
95th Queue (m)	337.2	207.8	207.4
Link Distance (m)		176.9	176.9
Upstream Blk Time (%)		25	24
Queuing Penalty (veh)		0	0
Storage Bay Dist (m)	300.0		
Storage Blk Time (%)	1		
Queuing Penalty (veh)	2		

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (m)	60.8	70.1	71.3	57.5	67.5	183.1	108.9	85.7	101.7	69.7	52.7	54.2
Average Queue (m)	25.1	25.3	10.9	7.9	10.3	68.4	24.5	24.5	52.9	33.6	25.9	28.8
95th Queue (m)	48.6	51.9	44.6	33.3	41.3	141.0	66.8	55.1	82.5	57.8	44.1	49.8
Link Distance (m)		168.4	168.4	168.4	168.4	218.3	218.3	218.3			335.8	335.8
Upstream Blk Time (%)						0						
Queuing Penalty (veh)						1						
Storage Bay Dist (m)	130.0								130.0	265.0		
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	NB
Directions Served	R
Maximum Queue (m)	50.2
Average Queue (m)	13.7
95th Queue (m)	32.8
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	265.0
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	L
Maximum Queue (m)	51.9	54.8	59.3	52.3	71.2	13.4	47.3	139.2	140.8	155.0	164.9	39.4
Average Queue (m)	27.5	32.7	28.3	25.6	40.7	2.5	3.8	90.4	97.4	124.3	73.3	16.4
95th Queue (m)	44.7	47.4	48.1	43.6	62.3	9.2	21.1	144.5	151.8	165.1	192.1	32.6
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)								1	1	13	5	
Queuing Penalty (veh)								7	6	66	24	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)								22				
Queuing Penalty (veh)								2				

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R
Maximum Queue (m)	50.9	18.2	15.9	9.3	49.2
Average Queue (m)	28.5	5.3	4.8	1.5	23.2
95th Queue (m)	47.4	13.7	13.3	6.3	41.7
Link Distance (m)	128.7	128.7		96.0	96.0
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)			60.0		
Storage Blk Time (%)	0				
Queuing Penalty (veh)	0				

Intersection: 15: Bayview Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	T	R	L	T	T	TR	L	L
Maximum Queue (m)	73.5	72.7	31.9	36.0	35.5	63.7	97.9	253.4	253.6	259.8	65.8	75.3
Average Queue (m)	40.2	41.9	10.4	17.2	18.2	29.5	14.3	170.8	221.3	232.7	20.0	34.7
95th Queue (m)	63.3	62.6	24.3	29.9	32.8	52.0	59.7	294.1	308.7	299.0	48.1	61.9
Link Distance (m)			131.2	131.2	131.2			244.4	244.4	244.4		
Upstream Blk Time (%)								4	27	60		
Queuing Penalty (veh)								0	0	0		
Storage Bay Dist (m)	70.0	70.0				50.0	120.0				95.0	95.0
Storage Blk Time (%)	0	0			0	1		5			0	0
Queuing Penalty (veh)	1	1			0	3		3			0	0

Intersection: 15: Bayview Drive & Mapleview Drive W

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	TR	L	T	T	R
Maximum Queue (m)	23.2	18.4	105.0	53.5	124.9	80.0
Average Queue (m)	6.6	7.2	51.6	19.6	38.0	51.2
95th Queue (m)	17.7	15.5	91.5	39.8	96.9	94.8
Link Distance (m)	218.2	218.2		214.5	214.5	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			110.0			45.0
Storage Blk Time (%)			1		0	16
Queuing Penalty (veh)			1		2	12

Intersection: 18: Bayview Drive & South Village Way/Barrie Molson Centre D/W

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	20.6	19.3	23.1	9.1	26.9	54.6	46.1	8.2	53.8	99.2
Average Queue (m)	8.0	6.6	4.8	1.4	8.4	11.1	11.0	0.7	13.8	32.5
95th Queue (m)	18.5	15.7	16.6	6.7	21.2	34.5	33.0	4.2	37.7	78.7
Link Distance (m)	126.0	126.0	60.2	60.2		214.5	214.5		195.2	195.2
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)					70.0			50.0		
Storage Blk Time (%)						0			0	
Queuing Penalty (veh)						0			0	

Intersection: 21: Bayview Drive & North Village Way/Private D/W

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	L	T	TR	L	T	TR
Maximum Queue (m)	20.7	23.2	11.3	17.0	34.0	32.0	6.3	61.3	77.4
Average Queue (m)	8.0	7.6	1.5	5.0	5.9	6.4	0.4	13.4	26.7
95th Queue (m)	17.5	21.2	7.1	13.9	21.3	21.9	3.4	37.5	59.4
Link Distance (m)		71.5	75.9		195.2	195.2		247.7	247.7
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (m)	25.0			70.0			70.0		
Storage Blk Time (%)	0							0	
Queuing Penalty (veh)	0							0	

Intersection: 24: Bayview Drive & Concert Way/Churchill Drive

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	16.6	14.2	21.2	36.6	32.3	40.3	38.0	28.3	57.2	78.8
Average Queue (m)	6.4	4.4	4.7	19.5	8.7	11.6	11.2	7.5	21.8	31.1
95th Queue (m)	14.8	12.3	14.4	31.8	23.8	29.2	29.7	19.2	44.9	59.6
Link Distance (m)				212.1		247.7	247.7		206.4	206.4
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	50.0	50.0	30.0		70.0			65.0		
Storage Blk Time (%)			0	1					0	
Queuing Penalty (veh)			0	0					0	

Intersection: 28: Bayview Drive & Industrial Site D/W - South/Coca-Cola D/W

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	L	L	TR
Maximum Queue (m)	9.0	21.5	8.2	10.3	4.5
Average Queue (m)	2.5	5.1	1.1	1.2	0.2
95th Queue (m)	9.0	15.2	5.6	6.2	3.2
Link Distance (m)	169.7	182.1			206.3
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)			15.0	15.0	
Storage Blk Time (%)				0	
Queuing Penalty (veh)				1	

Intersection: 29: Bayview Drive & Medical Centre South D/W - Industrial Site D/W North

Movement	EB	EB	NB	NB	SB
Directions Served	L	R	L	T	TR
Maximum Queue (m)	18.8	13.3	19.7	20.2	11.9
Average Queue (m)	6.5	5.9	10.8	0.9	1.6
95th Queue (m)	15.5	13.1	18.6	9.8	7.2
Link Distance (m)	102.1	102.1		206.3	137.8
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)			15.0		
Storage Blk Time (%)			3		
Queuing Penalty (veh)			7		

Intersection: 31: Bayview Drive & Medical Centre North D/W

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (m)	11.7	10.4
Average Queue (m)	3.5	3.5
95th Queue (m)	10.8	10.8
Link Distance (m)	108.5	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		15.0
Storage Blk Time (%)		0
Queuing Penalty (veh)		0

Intersection: 33: Bayview Drive & Big Bay Point Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	TR	L
Maximum Queue (m)	64.5	85.8	74.6	71.0	68.5	79.7	80.4	57.3	58.2	68.2	58.7	30.0
Average Queue (m)	28.3	43.2	40.7	35.2	33.9	43.3	40.7	16.7	18.2	33.2	18.0	11.2
95th Queue (m)	52.4	67.9	63.2	60.2	58.6	68.0	66.1	36.3	38.5	56.4	44.7	23.7
Link Distance (m)		835.0	835.0			287.9	287.9			92.4	92.4	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	25.0			25.0	40.0			25.0	100.0			40.0
Storage Blk Time (%)	11	24	25	15	7	11	20	1				0
Queuing Penalty (veh)	31	46	108	44	19	26	44	3				0

Intersection: 33: Bayview Drive & Big Bay Point Road

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (m)	48.2	37.7	51.3
Average Queue (m)	24.1	16.3	21.9
95th Queue (m)	41.6	34.3	42.1
Link Distance (m)	101.3	101.3	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			50.0
Storage Blk Time (%)	1	0	1
Queuing Penalty (veh)	1	0	1

Intersection: 39: Bryne Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	B38	B38	NB	NB
Directions Served	L	T	T	TR	L	T	T	TR	T	T	L	T
Maximum Queue (m)	31.6	76.6	83.7	99.7	32.3	87.1	66.0	40.2	24.6	5.0	36.0	16.0
Average Queue (m)	8.6	34.4	45.1	45.7	30.8	49.3	21.5	17.5	1.9	0.2	13.7	4.1
95th Queue (m)	20.4	63.9	75.2	81.5	36.6	96.7	50.6	32.5	12.8	3.5	28.0	12.0
Link Distance (m)		286.7	286.7	286.7		66.0	66.0	66.0	86.5	86.5		103.6
Upstream Blk Time (%)						9	0					
Queuing Penalty (veh)						44	1					
Storage Bay Dist (m)	60.0				25.0						45.0	
Storage Blk Time (%)		1			42	0					0	
Queuing Penalty (veh)		0			129	1					0	

Intersection: 39: Bryne Drive & Mapleview Drive W

Movement	NB	SB	SB	SB
Directions Served	TR	L	T	TR
Maximum Queue (m)	25.8	20.9	39.7	26.1
Average Queue (m)	9.8	6.0	16.7	10.0
95th Queue (m)	20.1	16.2	31.5	19.7
Link Distance (m)	103.6		194.0	194.0
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)		50.0		
Storage Blk Time (%)			0	
Queuing Penalty (veh)			0	

Intersection: 43: Big Bay Point Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	R
Maximum Queue (m)	9.2	56.1	46.6	9.1	23.2	33.6	201.7	28.1	10.2	24.0	11.6	17.0
Average Queue (m)	1.1	27.9	21.6	1.2	8.8	12.3	20.2	11.5	1.8	11.4	1.9	6.6
95th Queue (m)	5.9	47.3	41.1	6.1	20.7	26.7	136.5	22.1	7.1	21.4	7.5	13.8
Link Distance (m)		280.6	280.6			835.0	835.0			273.9	273.9	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	60.0			60.0	60.0			60.0	60.0			60.0
Storage Blk Time (%)		0										
Queuing Penalty (veh)		0										

Intersection: 43: Big Bay Point Road

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (m)	36.7	47.7	42.6	16.1
Average Queue (m)	18.6	24.8	12.0	5.2
95th Queue (m)	32.5	41.8	26.2	12.3
Link Distance (m)		203.3	203.3	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)	60.0			60.0
Storage Blk Time (%)		0		
Queuing Penalty (veh)		0		

Network Summary

Network wide Queuing Penalty: 868

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	334	1683	1592	762	295	314
v/c Ratio	0.69	0.46	0.60	0.52	0.58	0.68
Control Delay	40.2	3.8	5.9	4.0	47.1	41.3
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0
Total Delay	40.2	4.0	5.9	4.0	47.1	41.3
Queue Length 50th (m)	23.0	2.1	17.8	9.6	32.6	30.3
Queue Length 95th (m)	32.7	11.3	22.7	67.4	43.8	44.4
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	527	3688	2669	1468	825	703
Starvation Cap Reductn	0	1056	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	0.63	0.64	0.60	0.52	0.36	0.45

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	334	1683	0	0	1592	762	295	0	314	0	0	0
Future Volume (vph)	334	1683	0	0	1592	762	295	0	314	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0			6.0	4.0	6.0		6.0			
Lane Util. Factor	0.97	0.91			0.91	1.00	0.97		0.88			
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)	3213	5036			4893	1468	3242		2561			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3213	5036			4893	1468	3242		2561			
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	1683	0	0	1592	762	295	0	314	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	58	0	0	0
Lane Group Flow (vph)	334	1683	0	0	1592	762	295	0	256	0	0	0
Heavy Vehicles (%)	9%	3%	0%	0%	6%	10%	8%	0%	11%	0%	0%	0%
Turn Type	Prot	NA			NA	Free	Prot		Perm			
Protected Phases	5	2			6		8					
Permitted Phases						Free			8			
Actuated Green, G (s)	16.6	80.6			60.0	110.0	17.4		17.4			
Effective Green, g (s)	16.6	80.6			60.0	110.0	17.4		17.4			
Actuated g/C Ratio	0.15	0.73			0.55	1.00	0.16		0.16			
Clearance Time (s)	4.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)	484	3690			2668	1468	512		405			
v/s Ratio Prot	c0.10	0.33			c0.33		0.09					
v/s Ratio Perm						c0.52			0.10			
v/c Ratio	0.69	0.46			0.60	0.52	0.58		0.63			
Uniform Delay, d1	44.3	5.9			16.8	0.0	42.9		43.3			
Progression Factor	0.79	0.56			0.29	1.00	1.00		1.00			
Incremental Delay, d2	3.0	0.3			0.7	0.9	1.6		3.2			
Delay (s)	37.8	3.6			5.6	0.9	44.5		46.5			
Level of Service	D	A			A	A	D		D			
Approach Delay (s)		9.3			4.1			45.5			0.0	
Approach LOS		A			A			D			A	

Intersection Summary

HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.1%	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)	293	1562	29	8	1967	76	223	30	21	10	165
v/c Ratio	0.51	0.47	0.03	0.03	0.82	0.10	0.56	0.14	0.17	0.08	0.32
Control Delay	61.4	4.0	0.0	5.4	15.3	0.2	51.3	25.6	51.5	49.0	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.4	4.0	0.0	5.4	15.8	0.2	51.3	25.6	51.5	49.0	6.3
Queue Length 50th (m)	33.9	10.6	0.0	0.4	47.6	0.0	25.0	2.5	4.6	2.2	0.0
Queue Length 95th (m)	50.2	40.6	m0.0	m0.5	#202.1	m0.0	36.5	11.3	12.7	7.8	15.4
Internal Link Dist (m)		225.6			141.6			127.2		94.6	
Turn Bay Length (m)	160.0		175.0	50.0			50.0		60.0		
Base Capacity (vph)	572	3332	1046	271	2397	794	1103	558	121	128	516
Starvation Cap Reductn	0	0	0	0	132	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	0.51	0.47	0.03	0.03	0.87	0.10	0.20	0.05	0.17	0.08	0.32

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	293	1562	29	8	1967	76	223	12	18	21	10	165
Future Volume (vph)	293	1562	29	8	1967	76	223	12	18	21	10	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.91		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)	3367	4893	1476	1805	4848	1475	3467	1716		1805	1900	1599
Flt Permitted	0.95	1.00	1.00	0.15	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3367	4893	1476	288	4848	1475	3467	1716		1805	1900	1599
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)	293	1562	29	8	1967	76	223	12	18	21	10	165
RTOR Reduction (vph)	0	0	11	0	0	40	0	16	0	0	0	130
Lane Group Flow (vph)	293	1562	18	8	1967	36	223	14	0	21	10	35
Confl. Peds. (#/hr)	2		1	1		2			1	1		
Heavy Vehicles (%)	4%	6%	8%	0%	7%	8%	1%	0%	0%	0%	0%	1%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases			2	6		6						4
Actuated Green, G (s)	18.7	69.4	69.4	53.5	52.1	52.1	12.6	12.6		4.6	4.6	23.3
Effective Green, g (s)	18.7	69.4	69.4	53.5	52.1	52.1	12.6	12.6		4.6	4.6	23.3
Actuated g/C Ratio	0.17	0.63	0.63	0.49	0.47	0.47	0.11	0.11		0.04	0.04	0.21
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0
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)	572	3087	931	159	2296	698	397	196		75	79	338
v/s Ratio Prot	c0.09	0.32		0.00	c0.41		c0.06	0.01		c0.01	0.01	0.02
v/s Ratio Perm			0.01	0.02		0.02						0.00
v/c Ratio	0.51	0.51	0.02	0.05	0.86	0.05	0.56	0.07		0.28	0.13	0.10
Uniform Delay, d1	41.5	11.0	7.6	14.6	25.6	15.6	46.1	43.5		51.1	50.8	34.9
Progression Factor	1.39	0.35	1.00	0.65	0.49	0.11	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	0.5	0.0	0.1	2.5	0.1	1.8	0.2		2.0	0.7	0.1
Delay (s)	58.4	4.4	7.6	9.6	15.0	1.8	47.9	43.6		53.1	51.5	35.1
Level of Service	E	A	A	A	B	A	D	D		D	D	D
Approach Delay (s)		12.8			14.5			47.4			37.8	
Approach LOS		B			B			D			D	

Intersection Summary

HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	73.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (m)	56.2	56.5	91.4	65.2	97.3	202.6	184.5	89.6	63.5	55.0	53.2	65.3
Average Queue (m)	28.4	26.8	9.8	6.9	9.8	97.3	43.6	28.6	8.2	30.4	27.3	33.1
95th Queue (m)	47.2	47.4	48.7	33.5	48.9	197.6	138.0	67.0	35.0	51.9	47.2	57.2
Link Distance (m)		168.4	168.4	168.4	168.4	218.3	218.3	218.3			335.8	335.8
Upstream Blk Time (%)			0		0	1	0					
Queuing Penalty (veh)			0		0	6	0					
Storage Bay Dist (m)	130.0								130.0	265.0		
Storage Blk Time (%)								0				
Queuing Penalty (veh)								0				

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	NB
Directions Served	R
Maximum Queue (m)	53.4
Average Queue (m)	15.4
95th Queue (m)	37.2
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	265.0
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	L
Maximum Queue (m)	50.8	54.6	48.6	44.6	66.4	8.0	37.5	138.0	142.7	142.7	160.6	38.4
Average Queue (m)	28.2	33.8	22.7	22.0	36.9	1.5	2.7	78.8	79.5	102.0	38.9	15.4
95th Queue (m)	45.2	47.7	41.2	38.1	60.7	6.3	18.3	136.1	142.4	153.6	137.9	31.0
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)								1	1	5	2	
Queuing Penalty (veh)								4	3	24	11	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)								23				0
Queuing Penalty (veh)								2				0

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R
Maximum Queue (m)	51.0	14.4	17.2	11.9	42.4
Average Queue (m)	26.3	4.3	5.4	2.6	21.2
95th Queue (m)	45.0	11.4	13.6	8.4	39.4
Link Distance (m)	128.7	128.7		96.0	96.0
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)			60.0		
Storage Blk Time (%)	0				
Queuing Penalty (veh)	1				

Zone Summary

Zone wide Queuing Penalty: 51

Queues

210434

3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

2026 Future Total - PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	27	1278	421	1681	36	47	549	362	55
v/c Ratio	0.18	0.56	0.81	0.69	0.09	0.12	0.93	0.68	0.05
Control Delay	19.1	30.7	68.9	15.9	23.1	37.7	43.2	37.3	21.1
Queue Delay	0.0	0.6	0.0	0.1	0.0	0.0	1.1	0.0	0.0
Total Delay	19.1	31.3	68.9	16.1	23.1	37.7	44.3	37.3	21.1
Queue Length 50th (m)	2.8	86.8	43.7	138.0	5.9	10.1	66.9	73.1	3.8
Queue Length 95th (m)	m7.4	107.0	68.3	38.3	11.9	19.3	113.2	93.3	8.3
Internal Link Dist (m)		85.2		118.2		85.0			175.8
Turn Bay Length (m)	70.0		65.0		20.0			40.0	
Base Capacity (vph)	146	2283	545	2436	391	540	677	530	1268
Starvation Cap Reductn	0	0	0	139	0	0	0	0	0
Spillback Cap Reductn	0	575	0	0	0	0	29	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.75	0.77	0.73	0.09	0.09	0.85	0.68	0.04

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

210434

3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

2026 Future Total - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	1253	25	421	1303	378	36	47	549	362	39	16
Future Volume (vph)	27	1253	25	421	1303	378	36	47	549	362	39	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0	6.0	4.0	6.0	
Lane Util. Factor	1.00	0.86		0.97	0.91		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.99	1.00	
Frt	1.00	1.00		1.00	0.97		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	6326		3502	4873		1805	1900	1575	1775	3452	
Flt Permitted	0.09	1.00		0.95	1.00		0.72	1.00	1.00	0.64	1.00	
Satd. Flow (perm)	174	6326		3502	4873		1367	1900	1575	1195	3452	
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)	27	1253	25	421	1303	378	36	47	549	362	39	16
RTOR Reduction (vph)	0	2	0	0	36	0	0	0	248	0	11	0
Lane Group Flow (vph)	27	1276	0	421	1645	0	36	47	301	362	44	0
Confl. Peds. (#/hr)	7		1	1		7			6	6		
Heavy Vehicles (%)	0%	3%	2%	0%	2%	3%	0%	0%	0%	1%	0%	0%
Turn Type	pm+pt	NA		Prot	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2						8		8	4		
Actuated Green, G (s)	48.9	45.3		19.2	60.9		32.9	29.5	29.5	49.5	42.1	
Effective Green, g (s)	48.9	45.3		19.2	60.9		32.9	29.5	29.5	49.5	42.1	
Actuated g/C Ratio	0.38	0.35		0.15	0.47		0.25	0.23	0.23	0.38	0.32	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0	6.0	4.0	6.0	
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)	110	2204		517	2282		357	431	357	526	1117	
v/s Ratio Prot	0.01	0.20		c0.12	c0.34		0.00	0.02		c0.08	0.01	
v/s Ratio Perm	0.09						0.02		c0.19	0.18		
v/c Ratio	0.25	0.58		0.81	0.72		0.10	0.11	0.84	0.69	0.04	
Uniform Delay, d1	26.6	34.6		53.7	27.7		37.0	39.8	48.0	32.3	30.1	
Progression Factor	0.91	0.85		1.07	0.54		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.1	1.1		8.4	1.8		0.1	0.1	16.3	3.7	0.0	
Delay (s)	25.2	30.3		65.7	16.7		37.1	39.9	64.4	36.0	30.1	
Level of Service	C	C		E	B		D	D	E	D	C	
Approach Delay (s)		30.2			26.5			61.0			35.2	
Approach LOS		C			C			E			D	

Intersection Summary

HCM 2000 Control Delay	33.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	86.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	1891	271	458	1733	788	368
v/c Ratio	0.80	0.41	0.93	0.52	0.90	0.49
Control Delay	30.1	8.9	45.2	9.6	61.0	36.2
Queue Delay	0.3	0.3	0.0	0.5	1.0	0.0
Total Delay	30.4	9.2	45.2	10.0	62.0	36.2
Queue Length 50th (m)	148.7	10.2	100.4	114.6	104.9	39.6
Queue Length 95th (m)	145.6	m19.6	#164.9	136.3	#137.1	57.0
Internal Link Dist (m)	118.2			168.8		
Turn Bay Length (m)		45.0	135.0		300.0	300.0
Base Capacity (vph)	2364	658	531	3329	906	778
Starvation Cap Reductn	103	85	0	967	0	0
Spillback Cap Reductn	0	0	0	269	25	2
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.47	0.86	0.73	0.89	0.47

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1891	271	458	1733	0	0	0	0	788	0	368
Future Volume (vph)	0	1891	271	458	1733	0	0	0	0	788	0	368
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	4.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	1.00	0.91					0.97		0.88
Frpb, ped/bikes		1.00	1.00	1.00	1.00					1.00		1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		6408	1553	1736	5136					3367		2733
Flt Permitted		1.00	1.00	0.08	1.00					0.95		1.00
Satd. Flow (perm)		6408	1553	141	5136					3367		2733
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	1891	271	458	1733	0	0	0	0	788	0	368
RTOR Reduction (vph)	0	0	86	0	0	0	0	0	0	0	0	44
Lane Group Flow (vph)	0	1891	185	458	1733	0	0	0	0	788	0	324
Confl. Peds. (#/hr)	4					4						
Heavy Vehicles (%)	0%	2%	4%	4%	1%	0%	0%	0%	0%	4%	0%	4%
Turn Type		NA	Perm	pm+pt	NA					Prot		Perm
Protected Phases		2		1	6					4		
Permitted Phases			2	6								4
Actuated Green, G (s)		48.0	48.0	84.3	84.3					33.7		33.7
Effective Green, g (s)		48.0	48.0	84.3	84.3					33.7		33.7
Actuated g/C Ratio		0.37	0.37	0.65	0.65					0.26		0.26
Clearance Time (s)		6.0	6.0	4.0	6.0					6.0		6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		3.0
Lane Grp Cap (vph)		2366	573	487	3330					872		708
v/s Ratio Prot		0.30		c0.23	0.34					c0.23		
v/s Ratio Perm			0.12	c0.38								0.12
v/c Ratio		0.80	0.32	0.94	0.52					0.90		0.46
Uniform Delay, d1		36.7	29.4	39.2	12.1					46.6		40.5
Progression Factor		0.73	0.46	0.64	0.74					1.00		1.00
Incremental Delay, d2		2.3	1.1	20.5	0.4					12.6		0.5
Delay (s)		29.1	14.8	45.6	9.4					59.2		40.9
Level of Service		C	B	D	A					E		D
Approach Delay (s)		27.3			17.0			0.0			53.4	
Approach LOS		C			B			A			D	

Intersection Summary

HCM 2000 Control Delay	28.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	119.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	735	1944	1662	1124	529	520
v/c Ratio	0.98	0.55	0.71	1.09	0.77	0.87
Control Delay	58.4	12.8	23.9	62.8	57.1	60.8
Queue Delay	0.0	1.4	0.0	3.9	0.0	0.0
Total Delay	58.4	14.2	23.9	66.6	57.1	60.8
Queue Length 50th (m)	~113.5	145.2	74.6	~115.6	68.7	68.4
Queue Length 95th (m)	m#145.4	156.3	m74.6	m#124.4	89.0	#96.7
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	750	3560	2327	1030	739	634
Starvation Cap Reductn	0	1332	0	58	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.87	0.71	1.16	0.72	0.82

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)	735	1944	0	0	1662	1124	529	0	520	0	0	0
Future Volume (vph)	735	1944	0	0	1662	1124	529	0	520	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0			6.0	6.0	6.0		6.0			
Lane Util. Factor	0.97	0.91			0.91	1.00	0.97		0.88			
Frpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00			
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)	3433	5036			5085	1583	3433		2733			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3433	5036			5085	1583	3433		2733			
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)	735	1944	0	0	1662	1124	529	0	520	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	306	0	0	47	0	0	0
Lane Group Flow (vph)	735	1944	0	0	1662	818	529	0	473	0	0	0
Confl. Peds. (#/hr)			3	3								
Heavy Vehicles (%)	2%	3%	0%	0%	2%	2%	2%	0%	4%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Prot		Perm			
Protected Phases	5	2			6		8					
Permitted Phases						6			8			
Actuated Green, G (s)	28.4	91.9			59.5	59.5	26.1		26.1			
Effective Green, g (s)	28.4	91.9			59.5	59.5	26.1		26.1			
Actuated g/C Ratio	0.22	0.71			0.46	0.46	0.20		0.20			
Clearance Time (s)	4.0	6.0			6.0	6.0	6.0		6.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0			
Lane Grp Cap (vph)	749	3560			2327	724	689		548			
v/s Ratio Prot	c0.21	0.39			0.33		0.15					
v/s Ratio Perm						c0.52			c0.17			
v/c Ratio	0.98	0.55			0.71	1.13	0.77		0.86			
Uniform Delay, d1	50.5	9.1			28.4	35.2	49.1		50.2			
Progression Factor	0.73	1.32			0.82	0.94	1.00		1.00			
Incremental Delay, d2	19.8	0.3			0.4	63.1	5.1		13.2			
Delay (s)	56.6	12.4			23.7	96.3	54.2		63.4			
Level of Service	E	B			C	F	D		E			
Approach Delay (s)		24.5			53.0			58.8			0.0	
Approach LOS		C			D			E			A	

Intersection Summary

HCM 2000 Control Delay	42.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	119.0%	ICU Level of Service	H
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)	383	1795	64	60	1504	236	827	80	205	50	456
v/c Ratio	1.09	1.03	0.10	0.37	1.02	0.41	0.92	0.17	0.64	0.15	1.13
Control Delay	130.7	52.7	0.5	26.1	62.3	7.6	62.2	33.4	60.2	47.4	117.3
Queue Delay	0.0	0.0	0.0	0.0	3.7	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	130.7	52.7	0.5	26.1	66.0	7.6	62.2	33.4	60.2	47.4	117.3
Queue Length 50th (m)	~58.3	~199.2	0.2	6.5	~159.1	4.1	110.6	14.6	52.4	11.7	~111.9
Queue Length 95th (m)	m#90.3	#231.2	m0.6	m10.2	#183.9	m13.8	#144.7	28.2	80.2	24.0	#180.7
Internal Link Dist (m)		225.6			141.6			127.2		94.6	
Turn Bay Length (m)	160.0		175.0	50.0			50.0		60.0		
Base Capacity (vph)	350	1743	627	164	1472	577	933	494	321	338	405
Starvation Cap Reductn	0	0	0	0	16	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	1.09	1.03	0.10	0.37	1.03	0.41	0.89	0.16	0.64	0.15	1.13

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.
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)	383	1795	64	60	1504	236	827	65	15	205	50	456
Future Volume (vph)	383	1795	64	60	1504	236	827	65	15	205	50	456
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		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)	3502	4940	1578	1787	5036	1529	3467	1812		1805	1900	1615
Flt Permitted	0.95	1.00	1.00	0.11	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	4940	1578	198	5036	1529	3467	1812		1805	1900	1615
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)	383	1795	64	60	1504	236	827	65	15	205	50	456
RTOR Reduction (vph)	0	0	42	0	0	130	0	7	0	0	0	118
Lane Group Flow (vph)	383	1795	22	60	1504	106	827	73	0	205	50	338
Confl. Peds. (#/hr)	3		1	1		3			2	2		
Heavy Vehicles (%)	0%	5%	1%	1%	3%	4%	1%	2%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2	6		6						4
Actuated Green, G (s)	13.0	45.1	45.1	43.9	38.0	38.0	33.9	33.9		23.1	23.1	23.1
Effective Green, g (s)	13.0	45.1	45.1	43.9	38.0	38.0	33.9	33.9		23.1	23.1	23.1
Actuated g/C Ratio	0.10	0.35	0.35	0.34	0.29	0.29	0.26	0.26		0.18	0.18	0.18
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	350	1713	547	138	1472	446	904	472		320	337	286
v/s Ratio Prot	c0.11	c0.36		0.02	0.30		c0.24	0.04		0.11	0.03	
v/s Ratio Perm			0.01	0.13		0.07						c0.21
v/c Ratio	1.09	1.05	0.04	0.43	1.02	0.24	0.91	0.16		0.64	0.15	1.18
Uniform Delay, d1	58.5	42.5	28.1	34.1	46.0	35.0	46.6	37.0		49.6	45.1	53.5
Progression Factor	1.14	0.55	0.24	0.98	0.81	0.65	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	71.0	33.4	0.1	1.5	25.2	0.9	13.5	0.2		4.3	0.2	112.3
Delay (s)	137.8	56.8	6.8	34.8	62.2	23.6	60.2	37.2		53.9	45.3	165.8
Level of Service	F	E	A	C	E	C	E	D		D	D	F
Approach Delay (s)		69.2			56.3			58.1			125.0	
Approach LOS		E			E			E			F	

Intersection Summary

HCM 2000 Control Delay	70.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	95.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	465	1332	218	73	1212	272	237	284	180	498
v/c Ratio	0.84	0.52	0.29	0.33	0.66	0.76	0.40	0.69	0.25	0.91
Control Delay	73.3	18.8	6.6	19.8	37.1	70.8	40.6	41.2	42.7	40.8
Queue Delay	0.0	0.1	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.6
Total Delay	73.3	18.9	6.6	19.8	37.8	70.8	40.6	41.2	42.7	41.4
Queue Length 50th (m)	66.2	54.4	10.9	8.4	101.7	37.1	24.7	57.8	21.3	57.0
Queue Length 95th (m)	m67.0	m54.4	m11.6	17.8	128.1	#52.9	35.7	78.1	30.2	#103.0
Internal Link Dist (m)		141.6			238.0		219.7		226.0	
Turn Bay Length (m)	70.0		50.0	120.0		95.0		110.0		45.0
Base Capacity (vph)	587	2541	760	227	1826	373	788	411	934	620
Starvation Cap Reductn	0	306	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	277	0	0	0	0	17
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.60	0.29	0.32	0.78	0.73	0.30	0.69	0.19	0.83

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)	465	1332	218	73	1029	183	272	172	65	284	180	498
Future Volume (vph)	465	1332	218	73	1029	183	272	172	65	284	180	498
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3303	5085	1367	1703	4859		3467	3328		1686	3574	1524
Flt Permitted	0.95	1.00	1.00	0.18	1.00		0.95	1.00		0.46	1.00	1.00
Satd. Flow (perm)	3303	5085	1367	328	4859		3467	3328		820	3574	1524
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)	465	1332	218	73	1029	183	272	172	65	284	180	498
RTOR Reduction (vph)	0	0	78	0	18	0	0	32	0	0	0	239
Lane Group Flow (vph)	465	1332	140	73	1194	0	272	205	0	284	180	259
Confl. Peds. (#/hr)	1		4	4		1			1	1		
Heavy Vehicles (%)	6%	2%	16%	6%	2%	16%	1%	5%	0%	7%	1%	6%
Turn Type	Prot	NA	Perm	pm+pt	NA		Prot	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)	21.8	64.2	64.2	54.4	48.4		13.5	21.7		43.8	26.3	26.3
Effective Green, g (s)	21.8	64.2	64.2	54.4	48.4		13.5	21.7		43.8	26.3	26.3
Actuated g/C Ratio	0.17	0.49	0.49	0.42	0.37		0.10	0.17		0.34	0.20	0.20
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
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)	553	2511	675	200	1809		360	555		396	723	308
v/s Ratio Prot	c0.14	0.26		0.02	c0.25		0.08	0.06		c0.10	0.05	
v/s Ratio Perm			0.10	0.14						0.14		c0.17
v/c Ratio	0.84	0.53	0.21	0.36	0.66		0.76	0.37		0.72	0.25	0.84
Uniform Delay, d1	52.4	22.6	18.6	23.0	34.0		56.6	48.1		34.6	43.6	49.8
Progression Factor	1.32	0.77	0.83	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.2	0.2	0.2	1.1	1.9		8.7	0.4		6.1	0.2	17.9
Delay (s)	72.5	17.6	15.6	24.1	35.9		65.4	48.5		40.7	43.7	67.7
Level of Service	E	B	B	C	D		E	D		D	D	E
Approach Delay (s)		30.0			35.2			57.5			55.2	
Approach LOS		C			D			E			E	

Intersection Summary

HCM 2000 Control Delay	39.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	255	24	15	95	726	11	956
v/c Ratio	0.59	0.14	0.05	0.24	0.31	0.02	0.45
Control Delay	28.7	34.5	16.5	6.4	7.8	5.5	11.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.7	34.5	16.5	6.4	7.8	5.5	11.7
Queue Length 50th (m)	13.2	4.1	0.2	3.4	18.2	0.4	42.6
Queue Length 95th (m)	28.7	11.1	5.7	12.9	60.9	2.7	84.7
Internal Link Dist (m)	115.4		50.9		226.0		199.1
Turn Bay Length (m)				70.0		50.0	
Base Capacity (vph)	779	169	430	393	2380	580	2127
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.14	0.03	0.24	0.31	0.02	0.45

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	137	1	117	24	1	14	95	702	24	11	820	136
Future Volume (vph)	137	1	117	24	1	14	95	702	24	11	820	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor		0.95		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.93		1.00	0.86		1.00	1.00		1.00	0.98	
Flt Protected		0.97		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3244		1441	1634		1656	3425		1805	3375	
Flt Permitted		0.81		0.39	1.00		0.24	1.00		0.38	1.00	
Satd. Flow (perm)		2694		596	1634		419	3425		714	3375	
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	1	117	24	1	14	95	702	24	11	820	136
RTOR Reduction (vph)	0	104	0	0	12	0	0	1	0	0	9	0
Lane Group Flow (vph)	0	152	0	24	3	0	95	725	0	11	947	0
Confl. Peds. (#/hr)			6	6			7		2	2		7
Heavy Vehicles (%)	0%	0%	0%	25%	0%	0%	9%	5%	0%	0%	5%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		12.0		18.5	18.5		73.5	68.3		65.3	64.1	
Effective Green, g (s)		12.0		18.5	18.5		73.5	68.3		65.3	64.1	
Actuated g/C Ratio		0.12		0.18	0.18		0.71	0.66		0.63	0.62	
Clearance Time (s)		6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		310		126	290		360	2249		460	2080	
v/s Ratio Prot				c0.00	0.00		c0.01	0.21		0.00	c0.28	
v/s Ratio Perm		c0.06		0.03			0.17			0.01		
v/c Ratio		0.49		0.19	0.01		0.26	0.32		0.02	0.46	
Uniform Delay, d1		43.1		35.9	35.2		5.8	7.8		7.2	10.6	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.2		0.7	0.0		0.4	0.4		0.0	0.7	
Delay (s)		44.3		36.6	35.2		6.2	8.2		7.3	11.4	
Level of Service		D		D	D		A	A		A	B	
Approach Delay (s)		44.3			36.1			7.9			11.3	
Approach LOS		D			D			A			B	

Intersection Summary

HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	104.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	143	1	85	1	1	82	772	1025
v/c Ratio	0.55	0.00	0.37	0.01	0.00	0.20	0.30	0.46
Control Delay	45.4	40.0	11.6	35.0	0.0	4.7	5.0	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.4	40.0	11.6	35.0	0.0	4.7	5.0	10.5
Queue Length 50th (m)	26.0	0.2	0.0	0.2	0.0	2.7	18.5	44.7
Queue Length 95th (m)	45.3	1.8	11.5	1.6	0.0	10.6	46.0	91.7
Internal Link Dist (m)		62.1			66.5		199.1	252.7
Turn Bay Length (m)	25.0					70.0		
Base Capacity (vph)	261	475	383	185	564	443	2562	2234
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	0.55	0.00	0.22	0.01	0.00	0.19	0.30	0.46

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	143	1	85	1	0	1	82	771	1	0	882	143
Future Volume (vph)	143	1	85	1	0	1	82	771	1	0	882	143
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0			6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95			0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	0.85		1.00	1.00			0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1770	1900	1233	1805	1615		1805	3471			3464	
Flt Permitted	0.70	1.00	1.00	1.00	1.00		0.22	1.00			1.00	
Satd. Flow (perm)	1307	1900	1233	1900	1615		409	3471			3464	
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	1	85	1	0	1	82	771	1	0	882	143
RTOR Reduction (vph)	0	0	74	0	1	0	0	0	0	0	9	0
Lane Group Flow (vph)	143	1	11	1	0	0	82	772	0	0	1016	0
Confl. Peds. (#/hr)							2		2	2		2
Heavy Vehicles (%)	2%	0%	31%	0%	0%	0%	0%	4%	0%	0%	2%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	17.6	12.4	12.4	2.9	1.7		70.7	70.7			60.8	
Effective Green, g (s)	17.6	12.4	12.4	2.9	1.7		70.7	70.7			60.8	
Actuated g/C Ratio	0.18	0.12	0.12	0.03	0.02		0.70	0.70			0.61	
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	284	234	152	53	27		370	2446			2099	
v/s Ratio Prot	c0.06	0.00		0.00	0.00		0.01	c0.22			c0.29	
v/s Ratio Perm	c0.03		0.01	0.00			0.14					
v/c Ratio	0.50	0.00	0.07	0.02	0.00		0.22	0.32			0.48	
Uniform Delay, d1	37.1	38.5	38.8	47.3	48.5		5.9	5.6			11.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	1.4	0.0	0.2	0.1	0.0		0.3	0.3			0.8	
Delay (s)	38.5	38.5	39.0	47.5	48.5		6.2	6.0			11.8	
Level of Service	D	D	D	D	D		A	A			B	
Approach Delay (s)		38.7			48.0			6.0			11.8	
Approach LOS		D			D			A			B	

Intersection Summary

HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	100.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	75.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	93	23	58	54	40	61	828	70	1018
v/c Ratio	0.24	0.07	0.16	0.15	0.13	0.18	0.46	0.21	0.56
Control Delay	33.7	42.1	2.5	32.5	19.6	9.4	19.3	9.8	20.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.7	42.1	2.5	32.5	19.6	9.4	19.3	9.8	20.9
Queue Length 50th (m)	17.2	4.8	0.0	9.8	1.9	5.2	65.4	6.1	85.9
Queue Length 95th (m)	31.2	12.6	2.9	20.2	12.1	10.4	82.2	11.9	106.2
Internal Link Dist (m)		132.6			203.0		252.7		204.9
Turn Bay Length (m)	50.0		50.0	30.0		70.0		65.0	
Base Capacity (vph)	388	332	361	360	301	334	1790	330	1809
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	0.24	0.07	0.16	0.15	0.13	0.18	0.46	0.21	0.56

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	23	58	54	9	31	61	777	51	70	913	105
Future Volume (vph)	93	23	58	54	9	31	61	777	51	70	913	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.88		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1900	1593	1717	1653		1805	3457		1455	3486	
Flt Permitted	0.70	1.00	1.00	0.74	1.00		0.20	1.00		0.27	1.00	
Satd. Flow (perm)	1323	1900	1593	1342	1653		375	3457		415	3486	
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)	93	23	58	54	9	31	61	777	51	70	913	105
RTOR Reduction (vph)	0	0	48	0	26	0	0	4	0	0	7	0
Lane Group Flow (vph)	93	23	10	54	14	0	61	824	0	70	1011	0
Confl. Peds. (#/hr)			1	1			3		3	3		3
Heavy Vehicles (%)	0%	0%	0%	5%	0%	2%	0%	3%	8%	24%	2%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	30.0	21.0	21.0	28.0	20.0		71.0	62.0		71.0	62.0	
Effective Green, g (s)	30.0	21.0	21.0	28.0	20.0		71.0	62.0		71.0	62.0	
Actuated g/C Ratio	0.25	0.18	0.18	0.23	0.17		0.59	0.52		0.59	0.52	
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Grp Cap (vph)	366	332	278	338	275		329	1786		323	1801	
v/s Ratio Prot	c0.02	0.01		0.01	0.01		0.01	0.24		c0.02	c0.29	
v/s Ratio Perm	c0.04		0.01	0.03			0.10			0.11		
v/c Ratio	0.25	0.07	0.04	0.16	0.05		0.19	0.46		0.22	0.56	
Uniform Delay, d1	35.6	41.3	41.1	36.4	42.0		12.0	18.4		11.3	19.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	0.4	0.2	1.0	0.4		1.2	0.9		1.5	1.3	
Delay (s)	37.3	41.7	41.3	37.4	42.4		13.2	19.3		12.8	21.0	
Level of Service	D	D	D	D	D		B	B		B	C	
Approach Delay (s)		39.2			39.5			18.9			20.5	
Approach LOS		D			D			B			C	

Intersection Summary

HCM 2000 Control Delay	22.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	0	9	69	0	25	7	894	16	7	874	6
Future Volume (Veh/h)	25	0	9	69	0	25	7	894	16	7	874	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	25	0	9	69	0	25	7	894	16	7	874	6
Pedestrians					3						1	
Lane Width (m)					3.6						3.6	
Walking Speed (m/s)					1.2						1.2	
Percent Blockage					0						0	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								229				
pX, platoon unblocked	0.86	0.86		0.86	0.86	0.86				0.86		
vC, conflicting volume	1378	1818	440	1379	1813	459	880			913		
vC1, stage 1 conf vol	891	891		919	919							
vC2, stage 2 conf vol	487	927		460	894							
vCu, unblocked vol	1114	1626	440	1115	1620	46	880			574		
tC, single (s)	7.5	6.5	6.9	7.6	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.6	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	91	100	98	79	100	97	99			99		
cM capacity (veh/h)	285	275	565	330	275	875	764			866		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	34	94	7	596	314	7	583	297
Volume Left	25	69	7	0	0	7	0	0
Volume Right	9	25	0	0	16	0	0	6
cSH	328	396	764	1700	1700	866	1700	1700
Volume to Capacity	0.10	0.24	0.01	0.35	0.18	0.01	0.34	0.17
Queue Length 95th (m)	2.7	7.3	0.2	0.0	0.0	0.2	0.0	0.0
Control Delay (s)	17.2	16.9	9.8	0.0	0.0	9.2	0.0	0.0
Lane LOS	C	C	A			A		
Approach Delay (s)	17.2	16.9	0.1			0.1		
Approach LOS	C	C						

Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	38.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	110	110	41	900	778	29
Future Volume (Veh/h)	110	110	41	900	778	29
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	110	110	41	900	778	29
Pedestrians	1					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)					276	
pX, platoon unblocked	0.95	0.95	0.95			
vC, conflicting volume	1326	404	808			
vC1, stage 1 conf vol	794					
vC2, stage 2 conf vol	532					
vCu, unblocked vol	1235	264	690			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	70	84	95			
cM capacity (veh/h)	365	702	867			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	110	110	41	450	450	519	288
Volume Left	110	0	41	0	0	0	0
Volume Right	0	110	0	0	0	0	29
cSH	365	702	867	1700	1700	1700	1700
Volume to Capacity	0.30	0.16	0.05	0.26	0.26	0.31	0.17
Queue Length 95th (m)	10.0	4.4	1.2	0.0	0.0	0.0	0.0
Control Delay (s)	19.1	11.1	9.4	0.0	0.0	0.0	0.0
Lane LOS	C	B	A				
Approach Delay (s)	15.1		0.4			0.0	
Approach LOS	C						

Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	41.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	35	27	10	973	749	16
Future Volume (Veh/h)	35	27	10	973	749	16
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	35	27	10	973	749	16
Pedestrians	2					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)					122	
pX, platoon unblocked	0.93	0.93	0.93			
vC, conflicting volume	1266	384	767			
vC1, stage 1 conf vol	759					
vC2, stage 2 conf vol	506					
vCu, unblocked vol	1136	189	600			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	96	99			
cM capacity (veh/h)	398	768	917			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	62	10	486	486	499	266
Volume Left	35	10	0	0	0	0
Volume Right	27	0	0	0	0	16
cSH	504	917	1700	1700	1700	1700
Volume to Capacity	0.12	0.01	0.29	0.29	0.29	0.16
Queue Length 95th (m)	3.3	0.3	0.0	0.0	0.0	0.0
Control Delay (s)	13.2	9.0	0.0	0.0	0.0	0.0
Lane LOS	B	A				
Approach Delay (s)	13.2	0.1			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	37.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	177	723	213	232	486	140	425	583	92	315	327
v/c Ratio	0.61	0.71	0.40	0.75	0.46	0.25	0.76	0.45	0.30	0.38	0.56
Control Delay	31.1	42.3	15.1	36.7	36.3	6.9	31.9	27.2	22.3	40.7	8.4
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	31.1	42.3	15.1	36.7	36.3	6.9	31.9	27.2	22.3	40.7	8.4
Queue Length 50th (m)	27.0	84.3	14.3	35.1	52.0	0.7	71.4	51.9	12.3	35.5	0.0
Queue Length 95th (m)	44.5	107.1	36.3	#58.6	68.9	16.0	102.0	68.9	22.3	50.1	26.2
Internal Link Dist (m)		841.8			279.6			97.5		104.6	
Turn Bay Length (m)	25.0		25.0	40.0		25.0	100.0		40.0		50.0
Base Capacity (vph)	298	1018	529	321	1053	562	576	1287	307	835	579
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	0.59	0.71	0.40	0.72	0.46	0.25	0.74	0.45	0.30	0.38	0.56

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	723	213	232	486	140	425	421	162	92	315	327
Future Volume (vph)	177	723	213	232	486	140	425	421	162	92	315	327
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
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)	1253	3471	1476	1770	3574	1583	1734	3401		1770	3539	1396
Flt Permitted	0.37	1.00	1.00	0.20	1.00	1.00	0.43	1.00		0.43	1.00	1.00
Satd. Flow (perm)	488	3471	1476	366	3574	1583	793	3401		805	3539	1396
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	723	213	232	486	140	425	421	162	92	315	327
RTOR Reduction (vph)	0	0	96	0	0	96	0	33	0	0	0	250
Lane Group Flow (vph)	177	723	117	232	486	44	425	550	0	92	315	77
Confl. Peds. (#/hr)			1	1			2					2
Heavy Vehicles (%)	44%	4%	8%	2%	1%	2%	4%	2%	1%	2%	2%	14%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	48.1	35.0	35.0	48.5	35.2	35.2	55.1	44.1		35.2	28.2	28.2
Effective Green, g (s)	48.1	35.0	35.0	48.5	35.2	35.2	55.1	44.1		35.2	28.2	28.2
Actuated g/C Ratio	0.40	0.29	0.29	0.41	0.29	0.29	0.46	0.37		0.29	0.24	0.24
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	6.0
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)	280	1017	432	305	1053	466	546	1256		293	835	329
v/s Ratio Prot	0.07	0.21		c0.08	0.14		c0.15	0.16		0.02	0.09	
v/s Ratio Perm	0.18		0.08	c0.22		0.03	c0.21			0.07		0.06
v/c Ratio	0.63	0.71	0.27	0.76	0.46	0.09	0.78	0.44		0.31	0.38	0.23
Uniform Delay, d1	25.1	37.7	32.4	26.0	34.4	30.5	23.3	28.3		31.3	38.2	36.9
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	4.6	2.4	0.3	10.7	0.3	0.1	6.9	1.1		0.6	1.3	1.7
Delay (s)	29.7	40.1	32.7	36.6	34.7	30.6	30.2	29.4		31.9	39.5	38.5
Level of Service	C	D	C	D	C	C	C	C		C	D	D
Approach Delay (s)		37.0			34.6			29.8			38.1	
Approach LOS		D			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	34.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	119.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	102.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	87	1038	161	1194	124	409	104	112
v/c Ratio	0.25	0.33	0.39	0.37	0.51	0.71	0.59	0.33
Control Delay	6.7	11.7	7.2	1.2	53.3	20.1	58.9	30.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.7	11.7	7.2	1.2	53.3	20.1	58.9	30.4
Queue Length 50th (m)	5.3	41.9	1.0	3.4	29.6	11.3	24.5	7.3
Queue Length 95th (m)	11.6	60.2	m12.6	4.9	46.8	27.7	40.2	16.6
Internal Link Dist (m)		279.3		65.0		101.6		166.7
Turn Bay Length (m)	60.0		50.0		45.0		50.0	
Base Capacity (vph)	400	3103	562	3255	243	905	177	718
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	0.22	0.33	0.29	0.37	0.51	0.45	0.59	0.16

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)	87	876	162	161	1149	45	124	83	326	104	54	58
Future Volume (vph)	87	876	162	161	1149	45	124	83	326	104	54	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.88		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1804	4924		1769	5096		1790	3120		1787	3238	
Flt Permitted	0.20	1.00		0.24	1.00		0.68	1.00		0.35	1.00	
Satd. Flow (perm)	386	4924		441	5096		1273	3120		654	3238	
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)	87	876	162	161	1149	45	124	83	326	104	54	58
RTOR Reduction (vph)	0	13	0	0	2	0	0	297	0	0	53	0
Lane Group Flow (vph)	87	1025	0	161	1192	0	124	112	0	104	59	0
Confl. Peds. (#/hr)	8		7	7		8	10		1	1		10
Heavy Vehicles (%)	0%	3%	0%	2%	1%	4%	0%	0%	1%	1%	3%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	89.0	81.5		92.0	83.0		19.6	11.6		19.4	11.5	
Effective Green, g (s)	89.0	81.5		92.0	83.0		19.6	11.6		19.4	11.5	
Actuated g/C Ratio	0.68	0.63		0.71	0.64		0.15	0.09		0.15	0.09	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	346	3086		404	3253		223	278		166	286	
v/s Ratio Prot	0.01	0.21		c0.03	0.23		0.03	0.04		c0.04	0.02	
v/s Ratio Perm	0.16			c0.25			0.05			c0.06		
v/c Ratio	0.25	0.33		0.40	0.37		0.56	0.40		0.63	0.21	
Uniform Delay, d1	7.1	11.4		6.5	11.1		50.4	55.9		50.2	55.0	
Progression Factor	1.00	1.00		1.02	0.09		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.3		0.5	0.2		3.0	1.0		7.2	0.4	
Delay (s)	7.5	11.7		7.1	1.2		53.4	56.9		57.4	55.4	
Level of Service	A	B		A	A		D	E		E	E	
Approach Delay (s)		11.4			1.9			56.1			56.3	
Approach LOS		B			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	68.1%	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)	4	521	3	69	525	35	45	346	74	297	324	87
v/c Ratio	0.02	0.50	0.01	0.38	0.51	0.07	0.07	0.16	0.07	0.48	0.15	0.09
Control Delay	31.0	37.4	0.0	41.2	37.4	10.3	10.1	10.4	2.3	16.3	10.3	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	31.0	37.4	0.0	41.2	37.4	10.3	10.1	10.4	2.3	16.3	10.3	2.2
Queue Length 50th (m)	0.7	56.4	0.0	13.6	57.0	0.0	4.3	18.4	0.0	38.3	17.1	0.0
Queue Length 95th (m)	3.6	74.1	0.0	28.8	74.6	8.0	9.5	25.5	6.0	62.0	23.9	6.4
Internal Link Dist (m)		272.4			841.8			297.2			245.2	
Turn Bay Length (m)	60.0		60.0	60.0		60.0	60.0		60.0	60.0		60.0
Base Capacity (vph)	181	1032	480	183	1032	486	630	2152	991	616	2152	997
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	0.02	0.50	0.01	0.38	0.51	0.07	0.07	0.16	0.07	0.48	0.15	0.09

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	521	3	69	525	35	45	346	74	297	324	87
Future Volume (vph)	4	521	3	69	525	35	45	346	74	297	324	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	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)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.33	1.00	1.00	0.34	1.00	1.00	0.56	1.00	1.00	0.54	1.00	1.00
Satd. Flow (perm)	623	3539	1583	629	3539	1583	1035	3539	1583	1013	3539	1583
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)	4	521	3	69	525	35	45	346	74	297	324	87
RTOR Reduction (vph)	0	0	2	0	0	25	0	0	29	0	0	34
Lane Group Flow (vph)	4	521	1	69	525	10	45	346	45	297	324	53
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	35.0	35.0	35.0	35.0	35.0	35.0	73.0	73.0	73.0	73.0	73.0	73.0
Effective Green, g (s)	35.0	35.0	35.0	35.0	35.0	35.0	73.0	73.0	73.0	73.0	73.0	73.0
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.29	0.29	0.61	0.61	0.61	0.61	0.61	0.61
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Grp Cap (vph)	181	1032	461	183	1032	461	629	2152	962	616	2152	962
v/s Ratio Prot		0.15			c0.15			0.10			0.09	
v/s Ratio Perm	0.01		0.00	0.11		0.01	0.04		0.03	c0.29		0.03
v/c Ratio	0.02	0.50	0.00	0.38	0.51	0.02	0.07	0.16	0.05	0.48	0.15	0.06
Uniform Delay, d1	30.3	35.3	30.1	33.8	35.3	30.3	9.6	10.2	9.5	13.0	10.1	9.5
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	0.2	1.8	0.0	5.8	1.8	0.1	0.2	0.2	0.1	2.7	0.1	0.1
Delay (s)	30.5	37.1	30.1	39.7	37.1	30.4	9.8	10.4	9.6	15.7	10.3	9.6
Level of Service	C	D	C	D	D	C	A	B	A	B	B	A
Approach Delay (s)		37.0			37.0			10.2			12.5	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	24.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	B38	B38	B38	WB	WB	WB	WB
Directions Served	L	T	T	T	TR	T	T	T	L	L	T	T
Maximum Queue (m)	54.0	99.2	99.1	89.6	88.5	12.6	9.0	12.9	62.8	68.6	89.3	109.6
Average Queue (m)	10.5	60.6	61.4	50.8	50.9	0.9	0.9	0.6	30.9	38.6	35.2	52.4
95th Queue (m)	36.8	93.8	93.0	82.1	79.5	9.6	9.5	7.7	53.7	61.1	75.4	95.7
Link Distance (m)		86.8	86.8	86.8	86.8	65.4	65.4	65.4			114.0	114.0
Upstream Blk Time (%)		3	2	0	0							0
Queuing Penalty (veh)		9	7	1	1							0
Storage Bay Dist (m)	70.0								65.0	65.0		
Storage Blk Time (%)	0	7							0	1	1	
Queuing Penalty (veh)	0	2							2	3	4	

Intersection: 3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

Movement	WB	NB	NB	NB	SB	SB	SB
Directions Served	TR	L	T	R	L	T	TR
Maximum Queue (m)	114.7	24.5	20.7	90.7	47.4	179.1	145.2
Average Queue (m)	70.0	6.9	7.8	88.5	46.4	113.6	24.6
95th Queue (m)	114.0	17.8	19.0	102.8	51.4	211.6	93.4
Link Distance (m)	114.0		86.1	86.1		180.4	180.4
Upstream Blk Time (%)	0			82		12	0
Queuing Penalty (veh)	3			0		0	0
Storage Bay Dist (m)		20.0			40.0		
Storage Blk Time (%)		2	2		62	0	
Queuing Penalty (veh)		1	1		12	0	

Intersection: 6: Mapleview Drive W & Highway 400 SB Off-Ramp

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	T	R	L	T	T	T	L	L	R
Maximum Queue (m)	117.3	119.2	118.7	104.1	53.6	113.5	66.0	70.7	82.0	307.5	359.8	357.5
Average Queue (m)	66.1	64.6	48.9	46.5	11.8	53.5	25.1	28.5	39.4	302.9	345.2	321.2
95th Queue (m)	112.4	108.0	90.1	79.2	31.2	93.0	50.1	53.5	65.0	329.6	378.2	421.8
Link Distance (m)	114.0	114.0	114.0	114.0			168.4	168.4	168.4		326.9	326.9
Upstream Blk Time (%)	2	2	0	0			0		0		81	41
Queuing Penalty (veh)	10	10	1	1			0		0		0	0
Storage Bay Dist (m)					45.0	135.0				300.0		
Storage Blk Time (%)				7	0	0	0			15	82	49
Queuing Penalty (veh)				20	0	0	1			57	323	90

Intersection: 6: Mapleview Drive W & Highway 400 SB Off-Ramp

Movement	SB	B36	B36
Directions Served	R	T	T
Maximum Queue (m)	307.5	193.3	193.3
Average Queue (m)	222.6	156.5	154.1
95th Queue (m)	426.0	252.6	255.3
Link Distance (m)		176.9	176.9
Upstream Blk Time (%)		67	60
Queuing Penalty (veh)		0	0
Storage Bay Dist (m)	300.0		
Storage Blk Time (%)	0		
Queuing Penalty (veh)	1		

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (m)	138.6	155.6	148.4	115.0	106.8	95.3	59.5	202.4	182.0	92.2	94.1	92.2
Average Queue (m)	84.8	90.0	57.3	43.5	47.5	60.6	38.5	62.3	140.0	57.6	58.9	51.8
95th Queue (m)	146.6	155.4	121.2	90.9	89.8	87.3	56.6	146.3	190.2	85.3	85.8	81.6
Link Distance (m)		168.4	168.4	168.4	168.4	218.3	218.3	218.3			335.8	335.8
Upstream Blk Time (%)		1	0	0				0				
Queuing Penalty (veh)		4	1	0				1				
Storage Bay Dist (m)	130.0								130.0	265.0		
Storage Blk Time (%)	2	3							23			
Queuing Penalty (veh)	7	12							127			

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	NB
Directions Served	R
Maximum Queue (m)	77.9
Average Queue (m)	37.3
95th Queue (m)	72.5
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	265.0
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	L
Maximum Queue (m)	98.7	117.2	143.6	146.8	153.7	12.8	57.3	123.5	134.4	143.3	164.9	57.4
Average Queue (m)	60.6	65.9	72.5	69.4	80.6	3.5	13.4	64.2	115.3	133.0	150.4	54.6
95th Queue (m)	108.4	115.2	127.8	129.5	140.2	10.3	40.8	108.9	135.5	146.0	197.4	68.9
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)				0	0			0	0	17	33	
Queuing Penalty (veh)				0	0			0	0	78	150	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)			0		1		0	13				8
Queuing Penalty (veh)			1		0		0	8				31

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R
Maximum Queue (m)	133.3	137.5	65.6	100.6	100.6
Average Queue (m)	133.3	87.1	41.1	47.3	100.6
95th Queue (m)	133.3	180.9	65.4	117.5	100.6
Link Distance (m)	128.7	128.7		96.0	96.0
Upstream Blk Time (%)	74	16		7	89
Queuing Penalty (veh)	0	0		0	0
Storage Bay Dist (m)			60.0		
Storage Blk Time (%)	66		5		
Queuing Penalty (veh)	273		3		

Intersection: 15: Bayview Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	T	R	L	T	T	TR	L	L
Maximum Queue (m)	77.8	84.2	60.9	51.2	51.5	44.1	25.0	247.8	254.2	260.1	78.8	89.5
Average Queue (m)	53.2	56.1	25.0	30.0	31.4	18.4	7.6	108.0	224.0	250.7	30.8	52.4
95th Queue (m)	72.7	76.4	48.8	49.7	49.3	35.3	19.6	271.9	328.5	256.5	63.3	82.4
Link Distance (m)			131.2	131.2	131.2			244.4	244.4	244.4		
Upstream Blk Time (%)								2	48	98		
Queuing Penalty (veh)								0	0	0		
Storage Bay Dist (m)	70.0	70.0				50.0	120.0				95.0	95.0
Storage Blk Time (%)	2	5			0	0		0				0
Queuing Penalty (veh)	8	21			1	0		0				0

Intersection: 15: Bayview Drive & Mapleview Drive W

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	TR	L	T	T	R
Maximum Queue (m)	56.4	52.8	108.6	199.5	218.7	80.0
Average Queue (m)	25.4	22.2	60.7	64.3	143.4	70.3
95th Queue (m)	46.5	44.4	98.1	179.7	271.9	103.8
Link Distance (m)	218.2	218.2		214.5	214.5	
Upstream Blk Time (%)				0	7	
Queuing Penalty (veh)				0	35	
Storage Bay Dist (m)			110.0			45.0
Storage Blk Time (%)			2	0	0	60
Queuing Penalty (veh)			2	0	1	54

Intersection: 18: Bayview Drive & South Village Way/Barrie Molson Centre D/W

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	58.3	39.6	29.9	10.4	43.3	70.8	68.3	8.3	147.4	178.5
Average Queue (m)	27.1	16.1	7.7	2.3	14.8	22.9	25.2	1.7	42.3	79.9
95th Queue (m)	47.1	31.9	20.3	8.8	31.4	56.0	57.9	7.0	110.7	163.5
Link Distance (m)	126.0	126.0	60.2	60.2		214.5	214.5		195.2	195.2
Upstream Blk Time (%)									0	1
Queuing Penalty (veh)									0	3
Storage Bay Dist (m)					70.0			50.0		
Storage Blk Time (%)						0			3	
Queuing Penalty (veh)						0			0	

Intersection: 21: Bayview Drive & North Village Way/Private D/W

Movement	EB	EB	EB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	R	TR	L	T	TR	T	TR
Maximum Queue (m)	40.2	11.4	43.9	6.5	27.6	45.8	45.1	99.6	120.9
Average Queue (m)	21.1	0.9	15.6	0.4	8.5	14.2	14.3	26.7	49.7
95th Queue (m)	37.4	11.2	33.1	3.4	20.1	35.5	36.5	70.5	100.4
Link Distance (m)		71.5	71.5	75.9		195.2	195.2	247.7	247.7
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (m)	25.0				70.0				
Storage Blk Time (%)	10							0	
Queuing Penalty (veh)	0							0	

Intersection: 24: Bayview Drive & Concert Way/Churchill Drive

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	33.9	16.1	20.4	31.1	16.3	35.8	78.5	75.2	29.1	81.7	99.3
Average Queue (m)	15.9	4.9	8.3	10.0	6.3	9.0	43.6	40.8	10.9	50.0	65.7
95th Queue (m)	29.4	13.1	17.0	22.6	15.2	22.7	71.3	70.6	25.3	76.6	94.1
Link Distance (m)		140.4			212.1		247.7	247.7		206.4	206.4
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (m)	50.0		50.0	30.0		70.0			65.0		
Storage Blk Time (%)				1			1			1	
Queuing Penalty (veh)				0			0			1	

Intersection: 28: Bayview Drive & Industrial Site D/W South/Coca-Cola D/W

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	L	L	TR
Maximum Queue (m)	22.7	56.6	8.2	6.4	2.2
Average Queue (m)	8.0	19.2	1.0	0.6	0.1
95th Queue (m)	17.9	44.3	5.2	3.9	1.1
Link Distance (m)	174.9	182.1			206.3
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)			15.0	15.0	
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 29: Bayview Drive & Medical Centre South D/W

Movement	EB	EB	NB	SB
Directions Served	L	R	L	TR
Maximum Queue (m)	47.1	23.2	15.0	2.6
Average Queue (m)	20.9	11.0	4.8	0.1
95th Queue (m)	40.6	17.9	13.0	1.3
Link Distance (m)	102.1	102.1		137.8
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)			15.0	
Storage Blk Time (%)			0	
Queuing Penalty (veh)			2	

Intersection: 31: Bayview Drive & Medical Centre North D/W

Movement	EB	NB	NB	NB	SB
Directions Served	LR	L	T	T	T
Maximum Queue (m)	33.8	10.0	43.0	14.5	3.3
Average Queue (m)	12.3	1.2	2.7	0.5	0.1
95th Queue (m)	26.1	6.4	20.6	9.3	2.4
Link Distance (m)	108.5		137.8	137.8	92.4
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)		15.0			
Storage Blk Time (%)		0	1		
Queuing Penalty (veh)		0	0		

Intersection: 33: Bayview Drive & Big Bay Point Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	TR	L
Maximum Queue (m)	74.9	123.2	115.0	75.0	79.4	80.3	70.6	33.5	89.8	98.2	78.4	35.7
Average Queue (m)	51.0	72.6	70.1	35.2	43.8	47.4	40.3	12.6	61.4	49.0	27.4	15.1
95th Queue (m)	87.6	111.5	104.4	77.1	78.3	73.0	62.4	26.5	93.9	91.9	63.5	29.3
Link Distance (m)		833.1	833.1			287.9	287.9			92.4	92.4	
Upstream Blk Time (%)									1	2	0	
Queuing Penalty (veh)									0	10	0	
Storage Bay Dist (m)	25.0			25.0	40.0			25.0	100.0			40.0
Storage Blk Time (%)	30	48	51	4	20	12	21	0	1	2		0
Queuing Penalty (veh)	109	85	109	14	49	29	29	0	2	9		0

Intersection: 33: Bayview Drive & Big Bay Point Road

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (m)	57.9	49.6	62.2
Average Queue (m)	31.8	25.8	31.4
95th Queue (m)	51.0	44.6	55.1
Link Distance (m)	101.3	101.3	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			50.0
Storage Blk Time (%)	5	0	3
Queuing Penalty (veh)	5	1	4

Intersection: 39: Bryne Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	T	TR	L
Maximum Queue (m)	34.1	59.0	58.5	77.3	48.4	29.6	25.2	34.5	48.0	42.1	80.7	46.1
Average Queue (m)	12.1	25.7	32.0	31.9	18.5	5.0	3.6	4.8	23.9	16.0	33.7	20.3
95th Queue (m)	25.0	48.6	53.7	62.5	36.7	17.9	15.3	18.9	42.3	33.5	66.4	39.5
Link Distance (m)		286.6	286.6	286.6		65.4	65.4	65.4		97.4	97.4	
Upstream Blk Time (%)						0					0	
Queuing Penalty (veh)						1					0	
Storage Bay Dist (m)	60.0				50.0				45.0			50.0
Storage Blk Time (%)		0			1				1	0		0
Queuing Penalty (veh)		0			3				0	0		0

Intersection: 39: Bryne Drive & Mapleview Drive W

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (m)	33.8	20.3
Average Queue (m)	13.4	7.8
95th Queue (m)	28.0	16.3
Link Distance (m)	172.2	172.2
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 43: Bryne Road & Harvie Road/Big Bay Point Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	R
Maximum Queue (m)	11.6	78.4	65.8	9.0	40.6	70.7	72.6	15.3	17.8	43.9	32.6	16.2
Average Queue (m)	1.4	49.4	40.9	0.9	15.7	37.7	41.7	4.3	5.8	24.5	11.6	4.7
95th Queue (m)	7.2	71.1	63.8	5.3	32.7	59.9	63.2	12.5	14.1	38.8	26.3	12.0
Link Distance (m)		280.0	280.0			833.1	833.1			301.9	301.9	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	60.0			60.0	60.0			60.0	60.0			60.0
Storage Blk Time (%)		4	1			1	1					
Queuing Penalty (veh)		0	0			1	0					

Intersection: 43: Bryne Road & Harvie Road/Big Bay Point Road

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (m)	77.0	81.0	31.5	20.8
Average Queue (m)	43.2	21.5	13.5	5.6
95th Queue (m)	70.6	51.5	27.1	14.1
Link Distance (m)		249.9	249.9	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)	60.0			60.0
Storage Blk Time (%)	4			
Queuing Penalty (veh)	6			

Network Summary

Network wide Queuing Penalty: 1856

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	735	1944	1662	1124	529	520
v/c Ratio	0.88	0.55	0.76	0.71	0.76	0.86
Control Delay	37.9	6.3	27.0	6.0	56.0	59.1
Queue Delay	0.0	0.8	0.0	0.0	0.0	0.0
Total Delay	37.9	7.0	27.0	6.0	56.0	59.1
Queue Length 50th (m)	75.8	97.9	86.4	45.0	68.5	68.1
Queue Length 95th (m)	m92.4	74.2	m127.5	m82.6	88.1	91.4
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	924	3545	2177	1583	765	655
Starvation Cap Reductn	0	1145	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	0.80	0.81	0.76	0.71	0.69	0.79

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)	735	1944	0	0	1662	1124	529	0	520	0	0	0
Future Volume (vph)	735	1944	0	0	1662	1124	529	0	520	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0			6.0	4.0	6.0		6.0			
Lane Util. Factor	0.97	0.91			0.91	1.00	0.97		0.88			
Frpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00			
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)	3433	5036			5085	1583	3433		2733			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3433	5036			5085	1583	3433		2733			
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)	735	1944	0	0	1662	1124	529	0	520	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	47	0	0	0
Lane Group Flow (vph)	735	1944	0	0	1662	1124	529	0	473	0	0	0
Confl. Peds. (#/hr)			3	3								
Heavy Vehicles (%)	2%	3%	0%	0%	2%	2%	2%	0%	4%	0%	0%	0%
Turn Type	Prot	NA			NA	Free	Prot		Perm			
Protected Phases	5	2			6		8					
Permitted Phases						Free			8			
Actuated Green, G (s)	31.8	91.5			55.7	130.0	26.5		26.5			
Effective Green, g (s)	31.8	91.5			55.7	130.0	26.5		26.5			
Actuated g/C Ratio	0.24	0.70			0.43	1.00	0.20		0.20			
Clearance Time (s)	4.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)	839	3544			2178	1583	699		557			
v/s Ratio Prot	c0.21	0.39			0.33		0.15					
v/s Ratio Perm						c0.71			0.17			
v/c Ratio	0.88	0.55			0.76	0.71	0.76		0.85			
Uniform Delay, d1	47.2	9.3			31.5	0.0	48.7		49.8			
Progression Factor	0.65	0.62			0.79	1.00	1.00		1.00			
Incremental Delay, d2	5.9	0.3			1.0	1.1	4.7		11.6			
Delay (s)	36.7	6.0			25.9	1.1	53.4		61.4			
Level of Service	D	A			C	A	D		E			
Approach Delay (s)		14.5			15.9			57.4			0.0	
Approach LOS		B			B			E			A	

Intersection Summary

HCM 2000 Control Delay	22.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	88.6%	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	SBR
Lane Group Flow (vph)	383	1795	64	60	1504	236	827	80	205	50	456
v/c Ratio	0.84	0.88	0.09	0.38	0.92	0.38	0.95	0.17	0.89	0.21	0.84
Control Delay	67.4	29.9	0.7	24.4	41.3	5.8	68.8	34.8	92.5	53.0	50.5
Queue Delay	0.0	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.4	29.9	0.7	24.4	43.7	5.8	68.8	34.8	92.5	53.0	50.5
Queue Length 50th (m)	47.8	168.2	0.5	6.0	148.6	3.5	113.1	15.0	55.0	12.2	98.6
Queue Length 95th (m)	m#78.9	#203.4	m1.7	m8.9	#141.2	m9.4	#152.4	28.8	#99.7	25.1	#157.6
Internal Link Dist (m)		225.6			141.6			127.2		94.6	
Turn Bay Length (m)	160.0		175.0	50.0			50.0		60.0		
Base Capacity (vph)	454	2042	716	163	1627	624	880	466	236	248	542
Starvation Cap Reductn	0	0	0	0	58	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	0.84	0.88	0.09	0.37	0.96	0.38	0.94	0.17	0.87	0.20	0.84

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)	383	1795	64	60	1504	236	827	65	15	205	50	456
Future Volume (vph)	383	1795	64	60	1504	236	827	65	15	205	50	456
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		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)	3502	4940	1578	1787	5036	1529	3467	1812		1805	1900	1615
Flt Permitted	0.95	1.00	1.00	0.10	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	4940	1578	179	5036	1529	3467	1812		1805	1900	1615
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)	383	1795	64	60	1504	236	827	65	15	205	50	456
RTOR Reduction (vph)	0	0	38	0	0	131	0	7	0	0	0	56
Lane Group Flow (vph)	383	1795	26	60	1504	105	827	73	0	205	50	400
Confl. Peds. (#/hr)	3		1	1		3			2	2		
Heavy Vehicles (%)	0%	5%	1%	1%	3%	4%	1%	2%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases			2	6		6						4
Actuated Green, G (s)	16.8	52.9	52.9	47.9	42.0	42.0	32.6	32.6		16.6	16.6	33.4
Effective Green, g (s)	16.8	52.9	52.9	47.9	42.0	42.0	32.6	32.6		16.6	16.6	33.4
Actuated g/C Ratio	0.13	0.41	0.41	0.37	0.32	0.32	0.25	0.25		0.13	0.13	0.26
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0
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)	452	2010	642	138	1627	493	869	454		230	242	414
v/s Ratio Prot	0.11	c0.36		0.02	0.30		c0.24	0.04		0.11	0.03	c0.12
v/s Ratio Perm			0.02	0.14		0.07						0.12
v/c Ratio	0.85	0.89	0.04	0.43	0.92	0.21	0.95	0.16		0.89	0.21	0.97
Uniform Delay, d1	55.3	35.9	23.2	30.1	42.5	32.0	47.9	38.0		55.8	50.8	47.7
Progression Factor	0.95	0.69	0.73	1.06	0.79	0.60	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	14.6	5.4	0.1	1.5	7.6	0.7	19.7	0.2		32.0	0.4	34.9
Delay (s)	67.2	30.0	17.1	33.4	40.9	20.0	67.6	38.2		87.8	51.2	82.6
Level of Service	E	C	B	C	D	B	E	D		F	D	F
Approach Delay (s)		36.0			37.9			65.0			81.9	
Approach LOS		D			D			E			F	

Intersection Summary

HCM 2000 Control Delay	47.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	94.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (m)	80.3	82.0	91.1	71.6	72.4	144.0	90.2	96.3	141.6	94.9	94.2	86.5
Average Queue (m)	43.9	42.8	23.1	16.2	20.7	73.6	44.9	47.6	67.9	58.0	57.0	52.9
95th Queue (m)	71.8	74.1	68.4	51.9	58.9	118.4	72.5	74.9	113.5	82.3	83.4	77.7
Link Distance (m)		168.4	168.4	168.4	168.4	218.3	218.3	218.3			335.8	335.8
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	130.0								130.0	265.0		
Storage Blk Time (%)									1			
Queuing Penalty (veh)									6			

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	NB
Directions Served	R
Maximum Queue (m)	72.6
Average Queue (m)	36.4
95th Queue (m)	67.3
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	265.0
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	L
Maximum Queue (m)	109.9	116.2	112.2	99.0	107.1	11.9	57.2	124.2	129.4	144.2	163.3	57.4
Average Queue (m)	56.1	61.2	56.4	53.0	63.2	3.6	13.8	61.9	90.5	116.7	82.2	52.7
95th Queue (m)	106.9	110.5	101.8	94.5	108.3	10.4	39.9	113.2	148.6	168.3	197.8	69.0
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)								0	0	9	9	
Queuing Penalty (veh)								0	1	40	40	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)								12				9
Queuing Penalty (veh)								7				38

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R
Maximum Queue (m)	140.3	134.8	67.3	100.6	100.6
Average Queue (m)	133.7	79.4	58.1	68.9	93.9
95th Queue (m)	137.7	178.3	78.3	135.5	119.3
Link Distance (m)	128.7	128.7		96.0	96.0
Upstream Blk Time (%)	79	16		26	59
Queuing Penalty (veh)	0	0		0	0
Storage Bay Dist (m)			60.0		
Storage Blk Time (%)	71		42		
Queuing Penalty (veh)	295		21		

Zone Summary

Zone wide Queuing Penalty: 448

Appendix D

Mapleview Dr./Park Place Blvd. Improvement Alternatives Memorandum

5A-150 Pinebush Road
Cambridge ON N1R 8J8
p: 416.479.9684
905.381.2229
519.896.3163

www.ptsl.com

19 July 2019
Project: 190426

Steve Bishop
NA Park Place Limited Partnership
2851 John Street, Suite One
Markham, ON L3R 5R7

Dear Mr. Bishop:

RE: TRAFFIC AND FUNCTIONAL DESIGN STUDY, MAPLEVIEW DRIVE/PARK PLACE BOULEVARD-COSTCO ACCESS INTERSECTION, BARRIE, ON

The Mapleview Drive/Park Place Boulevard-Costco Access intersection has been experiencing congestion related to high traffic volumes on Mapleview Drive combined with high traffic volumes entering and exiting both Park Place and Costco. This situation has been exacerbated recently by the closure of Big Bay Point Road for construction purposes.

The purpose of this study is to assess the potential for improving the operation of the Park Place Boulevard approach to Mapleview Drive with relatively low cost measures. The study examines changes to signal timing and phasing as well as the introduction of dual southbound right turn movements. The latter improvement would primarily involve changes to the existing pavement markings on the southbound approach, which have been illustrated in a functional plan attached to this letter.

Data Collection

Traffic Data

The City of Barrie previously provided October 2018 Mapleview Drive intersection traffic data for the ongoing Park Place Traffic Impact Study (TIS). As part of the work for the TIS, relatively small adjustments were made to the AM and PM peak hour intersection approach volumes so that mid-block volumes between intersections would be balanced. The adjusted 2018 traffic volumes at the subject intersection were used for the assessment of improvement alternatives.

In examining the weekday AM and PM peak hour volumes, it is clear that the PM peak hour traffic is significantly higher (40-50%) than the AM peak hour traffic. Therefore, the PM peak hour represents the design condition for assessing future improvements.

Signal Timing Plan Data

City of Barrie staff also provided existing signal timing data for the Park Place TIS. The signal timing plan data for the Mapleview Drive/Park Place Boulevard intersection has been utilized as the starting point for the analysis herein.

A split three-phase timing plan is currently in place at the subject intersection. The three phases are as follows:

- Eastbound-westbound phase on Mapleview Drive (preceded by advanced left turn phases in each direction and followed by amber and all red clearance intervals);
- Southbound phase for Park Place Boulevard followed by amber and all red clearance intervals; and
- Northbound phase for Costco Access followed by amber and all red clearance intervals.

Field Observations

Paradigm staff conducted observations at the subject intersection on Wednesday July 3, 2019 from 4:00 to 5:30 PM. The focus was on the traffic operations and patterns associated with the southbound right turn from Park Place Boulevard to Mapleview Drive. This information was collected to determine whether there would be any lane imbalance issues on Park Place Boulevard with the proposed dual right turn operation (i.e. would traffic tend to concentrate in either of the two right turn lanes and diminish its usefulness or contribute to weaving problems on Mapleview Drive approaching the Highway 400 northbound on-ramp.

Through counts and observations, it was determined that approximately half of the southbound right turn volume is destined to the Highway 400 northbound on-ramp and half is destined further westbound on Mapleview Drive. **Table 1** summarizes the field data collected during the PM peak period.

TABLE 1: PARK PLACE BOULEVARD SOUTHBOUND RIGHT TURN PATTERN

Time Period	SBR at MVD/PP	Destined to Highway 400 NB		Destined to WB MVD	
	Vehicles	Vehicles	%	Vehicles	%
4:00 – 4:15 PM	118	67	57%	51	43%
4:15 – 4:30 PM	83	33	40%	50	60%
4:30 – 4:45 PM	86	35	41%	51	59%
4:45 – 5:00 PM	88	28	32%	60	68%
5:00 – 5:15 PM	83	41	49%	42	51%
5:15 – 5:30 PM	77	41	53%	36	47%
Total	**535**	**245**	**46%**	**290**	**54%**

Traffic Analysis

The weekday PM peak hour traffic volumes have been analyzed with the existing lane arrangements and signal timing plan to establish a base case and for several improvement alternatives – some with only signal timing adjustments (within the existing cycle length so as not to affect network coordination) and some with both signal timing adjustments and a southbound dual right turn operation. The southbound dual right turns are facilitated by converting the existing southbound through lane to a shared through/right lane. The southbound through movement represents a very low volume (approximately one vehicle per signal cycle on average).

Table 2 provides a summary of the analysis scenarios.

TABLE 2: ANALYSIS SCENARIOS

Scenario	Description
1	- Existing lane configuration - Existing signal timing plan
2	- Existing lane configuration - Optimized timing plan within existing cycle length ○ Provision of a southbound right turn overlap[1]

3	- Existing base year PM peak hour traffic volumes
	- Dual southbound right turn lane configuration
	  ○ Lane balance reflects equal use of both right turn lanes as observed (i.e. lane utilization factor and right turn factor parameters will be the same for the shared through/right and exclusive right turn lanes)
	- Optimized timing plan within existing cycle length
	  ○ No right turns on red allowed[2]
	  ○ ***Without*** the provision of a southbound right turn overlap

4	- Existing base year PM peak hour traffic volumes
	- Dual southbound right turn lane configuration
	  ○ Lane balance will reflect equal use of both right turn lanes as observed (i.e. lane utilization factor and right turn factor parameters will be the same for the shared through/right and exclusive right turn lanes)
	- Optimized timing plan within existing cycle length
	  ○ No right turns on red allowed[2]
	  ○ ***With*** the provision of a southbound right turn overlap[1]

[1]Southbound right overlap refers to providing a southbound right turn signal indication that runs concurrently with the eastbound-westbound advanced left turn phases since these movements do not conflict, nor do they conflict with pedestrian crossing signal phases

[2]With dual right turn lane operation, right turns on red must be restricted due to safety concerns (with the existing single right turn lane operation, right turns on red are allowed)

To assess the existing peak hour traffic operating conditions, an analysis has been conducted using Synchro 9.1 software, which implements the methods of the Highway Capacity Manual (HCM). The following parameters have been utilized in the analysis of each scenario:

- Heavy vehicle percentages as derived from existing traffic counts;
- Conflicting pedestrian volumes as derived from existing traffic counts;
- Calculated intersection peak hour factors (PHF) for the PM peak hour. The use of the PHF results in an analysis of the peak 15-minute period flow during each peak hour;
- The analysis assumes that the westbound queuing along Mapleview Drive does not interfere with the southbound right turn movements outbound from Park Place. It should be noted that it was observed in the field that the westbound queue occasionally reaches back to Park Place Boulevard and temporarily interferes with traffic exiting from Park Place during the southbound signal phase; and
- Synchro default values for all other inputs.

Table 3, Table 4, Table 5, and Table 6 provide the results of the analysis, indicating LOS, average delays, v/c ratios, and 95th percentile queues experienced at the subject intersections for the analysis scenarios. **Attachment 1** contains the Synchro analysis outputs.

TABLE 3: SCENARIO 1 RESULTS (EXISTING CONDITIONS)

Approach/Movement		PM Peak Hour			
		LOS[1]	Delay[2]	V/C[3]	Q[4]
EB	Dual Left	F	192	1.26	121
	Triple Through	C	32	0.83	195
	Right	B	18	0.05	6
WB	Left	C	25	0.53	26
	Triple Through	C	33	0.79	169
	Right	C	21	0.03	< 1
NB	Dual Left	D	51	0.79	92
	Through/Right	D	41	0.34	44
SB	Left	D	54	0.26	21
	Through	D	55	0.34	26
	Right	F	891	2.80	224
Overall Intersection		***F***	***120***	***1.07***	**-**

[1] Level of Service; [2] Average vehicle delay in seconds; [3] Volume to capacity ratio; [4] 95th percentile queue in metre;

TABLE 4: SCENARIO 2 RESULTS (OPTIMIZED TIMING, SB RIGHT OVERLAP)

Approach/Movement		PM Peak Hour			
		LOS[1]	Delay[2]	V/C[3]	Q[4]
EB	Dual Left	D	51	0.74	88
	Triple Through	C	28	0.78	188
	Right	B	16	0.05	6
WB	Left	C	25	0.53	25
	Triple Through	D	42	0.89	196
	Right	C	24	0.03	< 1
NB	Dual Left	D	50	0.79	92
	Through/Right	D	40	0.34	44
SB	Left	E	59	0.42	21
	Through	E	64	0.56	27
	Right	F	127	1.11	177
Overall Intersection		***D***	***45***	***0.92***	**-**

[1] Level of Service; [2] Average vehicle delay in seconds; [3] Volume to capacity ratio; [4] 95th percentile queue in metres

TABLE 5: SCENARIO 3 RESULTS (DUAL SB RIGHT, NO RIGHT OVERLAP)

Approach/Movement		PM Peak Hour			
		LOS[1]	Delay[2]	V/C[3]	Q[4]
EB	Dual Left	F	125	1.09	113
	Triple Through	D	54	0.99	236
	Right	C	23	0.05	7
WB	Left	C	32	0.54	25
	Triple Through	E	64	1.00	214
	Right	C	28	0.03	< 1
NB	Dual Left	D	50	0.79	92
	Through/Right	D	41	0.34	44
SB	Left	E	45	0.13	19
	Through/Right	F	145	1.11	149
	Right	F	132	1.08	142
Overall Intersection		***E***	***69***	***1.00***	**-**

[1] Level of Service; [2] Average vehicle delay in seconds; [3] Volume to capacity ratio; [4] 95th percentile queue in metres

TABLE 6: SCENARIO 4 RESULTS (DUAL SB RIGHT, WITH RIGHT OVERLAP)

Approach/Movement		PM Peak Hour			
		LOS[1]	Delay[2]	V/C[3]	Q[4]
EB	Dual Left	F	125	1.09	113
	Triple Through	D	54	0.99	236
	Right	C	23	0.05	7
WB	Left	C	32	0.54	25
	Triple Through	E	64	1.00	214
	Right	C	28	0.03	< 1
NB	Dual Left	D	50	0.79	92
	Through/Right	D	41	0.34	44
SB	Left	D	45	0.13	19
	Through/Right	F	145	1.11	148
	Right	D	40	0.59	89
Overall Intersection		***E***	***65***	***1.00***	**-**

[1] Level of Service; [2] Average vehicle delay in seconds; [3] Volume to capacity ratio; [4] 95th percentile queue in metres

Evaluation

An evaluation has been undertaken comparing the base case with the improvement alternatives in terms of delay and queuing on southbound Park Place Boulevard.

Table 7 provides an overall summary comparing all the scenarios focusing on the following measures of effectiveness:

- Overall intersection operations (LOS and v/c ratio); and
- Southbound Park Place Boulevard right turn operations (LOS, v/c ratio, and queuing, which includes a comparison of the 95th percentile queue length and the available storage lane length between Mapleview Drive and the internal Park Place roundabout).

TABLE 7: SCENARIO COMPARISON

Scenario	Overall Intersection		Southbound Right Turn Movement			
	LOS[1]	V/C[2]	LOS[1]	V/C[2]	Q[3]	Available[4]
1	F	1.07	F	2.80	224	-139
2	D	0.92	F	1.11	177	-92
3	E	1.00	F/F	1.11/1.08[5]	149/142[5]	-64/-57[5]
4	E	1.00	F/D	1.11/0.59[5]	148/89[5]	-63/-4[5]

[1] Level of service; [2] Volume to capacity ratio; [3] 95th percentile queue in metres; [4] Storage distance from Mapleview Drive to internal Roundabout = Approximately 85 metres. Available storage remaining determined by subtracting queue from storage distance
[5]Results for dual right turn scenarios shown as through/right lane first and exclusive right turn lane second

The key findings of the operational analysis and comparison of scenarios are as follows:

- The analysis of the base case scenario (Scenario 1) indicates that the subject intersection operates above approximately 7% above its theoretical capacity (v/c ratio 1.07). The volume demands also exceeds the theoretical capacity on some movements, and in particular, the southbound right turn. This movement has very long delays (LOS F) and queuing that occasionally reaches or goes beyond the roundabout intersection within the Park Place site;

- With the optimization of signal timings and the provision of a southbound right turn overlap phase (Scenario 2), traffic operations are significantly improved, and the overall intersection operation is within capacity. The southbound right turn movement is still shown to operate poorly with long delays (LOS F) and queuing that can exceed the available storage and interfere with the operation of the roundabout intersection within the Park Place site;

- With the provision of dual southbound right turn lanes (Scenario 3), the overall intersection operation would be at capacity, which indicates a marginal improvement over existing conditions. The southbound right turn movement would still experience long delays (LOS F) in both the shared through/right and exclusive right turn lanes. Each of the right turn lanes would have shorter queues compared to the first two scenarios, but the queue in both could exceed the available storage and occasionally interfere with the operation of the roundabout intersection within the Park Place site; and

- With the provision of the dual southbound right turn lanes and a southbound right overlap phase (Scenario 4), the overall intersection operation remains at capacity. A significant improvement is noted for the southbound exclusive right turn lane where it would operate with moderate delays (LOS D), well within capacity, and queuing would be accommodated within the available storage lane length. However, the shared through/right turn lane is shown to operate with long delays (LOS F), over its theoretical capacity, and with queues that would occasionally interfere with the operation of the roundabout intersection within the Park Place site. This presumably indicates that the presence of some through traffic in that lane during each phase (likely one or two vehicles) is restricting right turn flow during the right turn overlap phase. A southbound through vehicle would be facing a red signal during the overlap phase and would prevent right turn vehicles in the shared through/right lane from proceeding.

Functional Plan

A functional plan (DWG 1 attached) has been prepared to illustrate how dual southbound right turns could be facilitated on the Park Place Boulevard southbound approach to Mapleview Drive by converting the centre lane from through movements only to a shared through/right lane. This can be done with changes to the existing pavement markings (lane delineation and turn movement symbols) and does not require the physical widening of the approach.

In addition to pavement markings, the functional plan shows two sets of lane designation signs mounted along the west side of the approach. These are regulatory signs that indicate the legally permitted movements within these lanes and inform motorists of the dual right operation (with one lane shared with through movements). With the proximity of the Highway 400 northbound on ramp to Park Place Boulevard (approximately 60 metres to the beginning of the westbound right turn lane on Mapleview Drive that leads to the ramp), it is also recommended that an information sign be posted just south of the Park Place on-site roundabout to inform motorists that they should use the curb lane if destined to Highway northbound. As noted in the field observations, approximately half of the motorists making the southbound right turn during the weekday PM peak periods were destined to Highway 400 northbound. The sign would be intended to minimize the potential for these motorists to be in the outer southbound right turn lane and be forced to weave across the westbound curb lane on Mapleview Drive in an attempt to access the turn lane for the Highway 400 northbound on ramp. As noted above, there is very little distance in which to undertake this weaving maneuver.

Since the regulatory lane designation and information signs should be mounted immediately adjacent to the west side of Park Place Boulevard, it would be desirable to relocate the existing sidewalk along that side of the road further west to create a separate boulevard space for the signposts and signs. Having them mounted within a shared space along the sidewalk would present an undesirable safety risk to pedestrians using this sidewalk. There is existing landscaping along the west side of the sidewalk that could be converted in part to sidewalk.

Along with the pavement markings and signage discussed above, it would be necessary to modify the signal heads facing motorists on southbound Park Place Boulevard. A new arrow signal indication would have to be added to the signal heads to provide for the right turn overlap phase as previously discussed. Related changes would have to be made to the signal controller and signal timing plans.

Conclusions

The conclusions of this study are as follows:

- Relatively inexpensive changes could be made at the Mapleview Drive/Park Place Boulevard-Costco Access intersection to improve the operation of the southbound right turn movement;
- The simplest change would be to modify the signal heads facing southbound motorists and signal timing plans to introduce a southbound right turn overlap phase that would run concurrently with eastbound-westbound advanced left turn phases (Scenario 2). This would provide a noticeable improvement in intersection operations but there still be significant delay and queuing for the southbound right turn movement during the peak periods. More substantial improvements would likely be realized by southbound motorists during off peak periods and that is where the benefits of this change would be perceived the most;
- A further improvement in the southbound operation could be realized by introducing dual right turn lanes, with one of the lanes being a shared through/right lane. This

improvement combined with the southbound right turn overlap phase (Scenario 4) would improve operations mostly in the southbound curb lane, which would operate like it does today as an exclusive right turn lane. In addition to signal equipment and timing modifications, this improvement would require changes to pavement markings, signage, and the relocation of an on-site sidewalk. The benefits of this operation may be diminished during peak periods due to near capacity operations on Mapleview Drive and the effects of queuing between the closely spaced signalized intersections along this section of the corridor. So again, the benefits to southbound motorists exiting from Park Place Boulevard would most likely be experienced during off peak periods;

- In summary, the improvements discussed above would provide some short term relief to the existing congestion that is experienced in exiting from Park Place Boulevard onto Mapleview Drive westbound. However, since there are many factors affecting operations in the Mapleview Drive corridor, the improvements should not be expected to provide substantial relief. As noted in the analysis of the weekday PM peak hour traffic conditions, the level of service (a measure of delay) for this movement shows relatively little change in the scenarios examined and the potential for internal queuing temporarily interfering with the operation of the internal Park Place roundabout is common in all scenarios. As well, the provision of dual southbound right turn lanes could potentially lead to weaving issues and safety concerns on westbound Mapleview Drive along the section leading to the Highway 400 northbound on ramp if motorists leaving Park Place and destined to Highway 400 northbound do not select the southbound curb lane for their right turn movement.

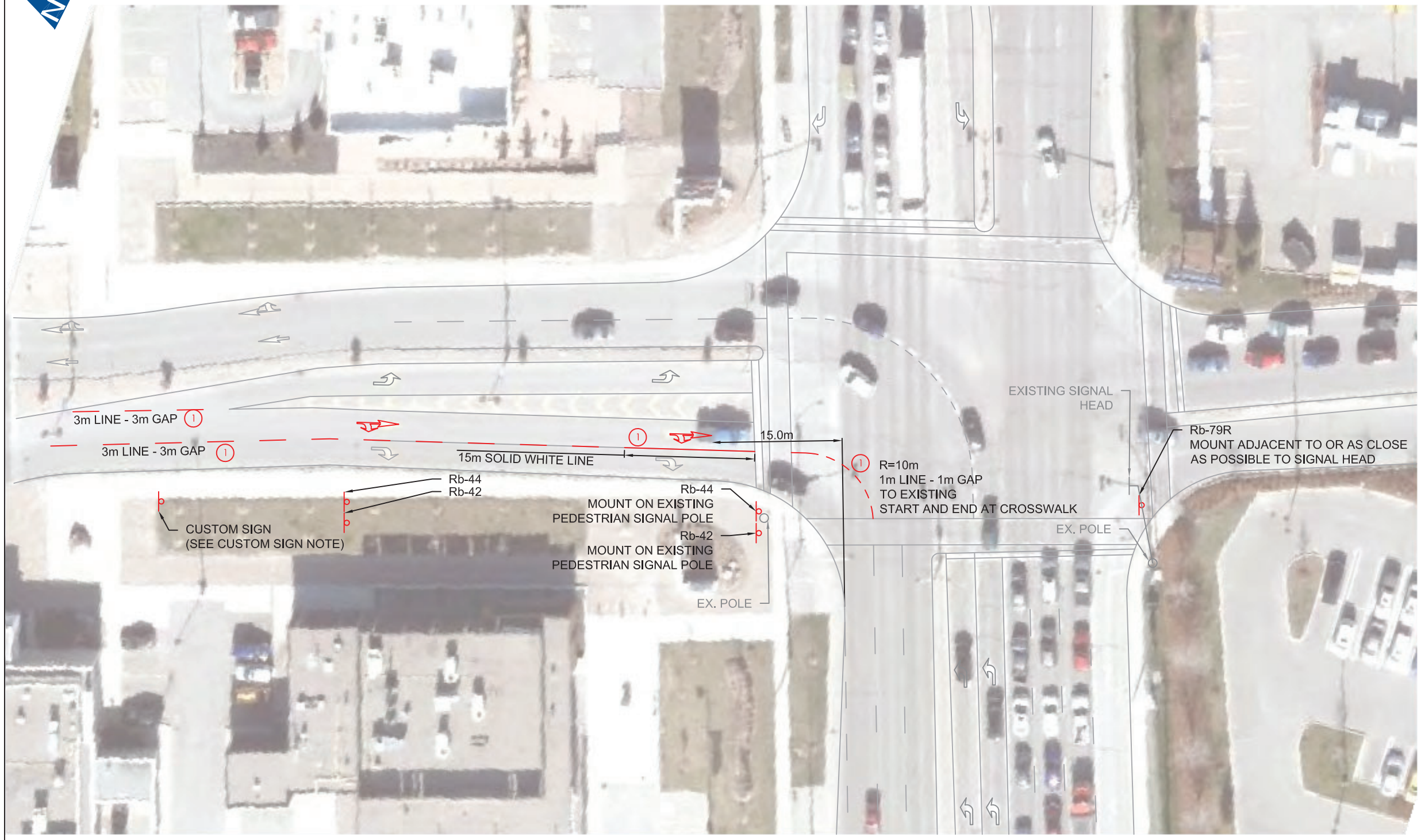
If you have any questions for comments regarding the analysis, functional drawing, or conclusions, please call or e-mail the undersigned.

Yours truly,

PARADIGM TRANSPORTATION SOLUTIONS LIMITED

Garry Pappin
BES, CET, LEL
Senior Project Manager

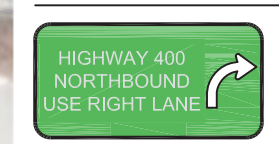
Attach.



SIGNAGE LEGEND

SIGN DETAIL	NAME	QUANTITY
	Rb-42 RIGHT TURN ONLY 600 x 600 mm	2
	Rb-44 STRAIGHT THROUGH OR RIGHT TURN ONLY 600 x 600 mm	2
	Rb-79R NO RIGHT TURN ON RED 600 x 900 mm	1
CUSTOM SIGN	CUSTOM SIGN SEE CUSTOM SIGN NOTE 900 x 450 mm	1

CUSTOM SIGN



PAVEMENT MARKINGS LEGEND

	NAME	DIMENSION	COLOUR
1	SOLID	0.10 m	WHITE
	EXISTING LANE MARKING		
	OTM BOOK 11 PAVEMENT MARKING ARROW		

NO.	DATE	INITIAL	REVISION DETAIL

APPROVAL:

FUNCTIONAL PLAN
SOUTHBOUND PARK PLACE BOULEVARD AT MAPLEVIEW DRIVE
PROPOSED DUAL RIGHT TURNS

paradigm

PROJECT NO.: 190426	DATE: JULY 2019	SCALE: 1:500	DRAWING NO.:
DRAWN: SH	DESIGN: SH	CHECK: GP	DWG 1

SIGNAGE NOTES

REGULATORY SIGNS SHALL NORMALLY BE LOCATED IN ACCORDANCE WITH SECTION 12 (SIGN POSITION) OF BOOK 1B. HOWEVER, SPECIFIC OR ADDITIONAL REQUIREMENTS FOR CERTAIN REGULATORY SIGNS MAY PRE-EMPT OR REVISE DIRECTIONS OR SPECIFICATIONS PRESCRIBED UNDER THE GENERAL STANDARDS IN BOOK 1B. SUCH DEVIATIONS OR EXCEPTIONS FROM THE BOOK 1B LOCATION PRINCIPLES ARE NOTED IN THIS BOOK UNDER THE HEADING "LOCATION CRITERIA" FOR THE RESPECTIVE SIGNS TO WHICH THEY APPLY. IF FOR A GIVEN SIGN, EXCEPTIONS ARE NOT NOTED UNDER THIS HEADING, THE BOOK 1B LOCATION PRINCIPLES APPLY.

PAVEMENT MARKING NOTES

PROVINCIAL LEGISLATION PROVIDES THAT MARKINGS MAY BE PLACED BY THE ROAD AUTHORITY HAVING JURISDICTION FOR THE PURPOSE OF REGULATING, WARNING OR GUIDING TRAFFIC (SECTION 182 OF THE HIGHWAY TRAFFIC ACT (R.S.O. 1990)).

MARKINGS AND DELINEATION SERVE AN ADVISORY OR WARNING FUNCTION, AND DO NOT HAVE LEGAL FORCE OF THEIR OWN. THEY MAY BE USED TO COMPLEMENT OTHER TRAFFIC CONTROL DEVICES ENFORCEABLE UNDER THE HTA, ITS REGULATIONS, OR A MUNICIPAL BY-LAW, BUT THEIR ENFORCEABILITY DERIVES FROM THE MAIN REGULATORY TRAFFIC CONTROL DEVICE, NOT FROM THE MARKINGS OR DELINEATION. TO AVOID POSSIBLE CONFLICT OR CONFUSION, THE MEANING OF MARKINGS AND DELINEATION SHOULD BE CHECKED AGAINST THE PREVAILING TRAFFIC LAWS AND REGULATIONS BEFORE THEY ARE INSTALLED OR REMOVED.

SIGNAGE POSITION NOTES

SIGNAGE SHOULD CONFORM TO ONTARIO TRAFFIC MANUAL STANDARDS WHERE POSSIBLE.

HORIZONTAL MOUNTING OFFSET

THE BASIC GUIDELINES FOR HORIZONTAL MOUNTING OFFSETS ARE AS FOLLOWS:

- URBAN OR RESIDENTIAL AREAS WITH RAISED CURBS: 30 CM TO 2 M FROM THE CURB LINE.

WHERE RESTRICTED BY PHYSICAL FEATURES SUCH AS CLIFFS, OR STRUCTURE FEATURES SUCH AS BRIDGE SUPPORTS, THE HORIZONTAL OFFSET SHOULD BE AS CLOSE AS POSSIBLE TO THE ABOVE GUIDELINES.

VERTICAL MOUNTING OFFSET

THE BASIC GUIDELINES FOR VERTICAL MOUNTING OFFSETS OF GROUND-MOUNTED SIGNS INCLUDE THE FOLLOWING:

- AREAS WITH NO PEDESTRIANS AND WITHOUT RAISED CURBS: 1.5 M TO 2.5 M FROM OUTER EDGE OF OUTER LANE TO BOTTOM OF PRINCIPAL SIGN, REGARDLESS OF WHETHER THERE IS A TAB SIGN MOUNTED BENEATH PRINCIPAL SIGN.
- AREAS WITH NO PEDESTRIANS AND WITH RAISED CURBS: 1.5 M TO 2.5 M FROM CURB LINE TO BOTTOM OF PRINCIPAL SIGN, REGARDLESS OF WHETHER THERE IS A TAB SIGN MOUNTED BENEATH PRINCIPAL SIGN.
- AREAS WITH PEDESTRIANS: 2 M TO 3 M FROM GROUND ELEVATION AT THE BASE OF THE SIGN POST TO THE BOTTOM OF THE OVERALL SIGN, INCLUDING TAB IF PRESENT.

HORIZONTAL & VERTICAL ANGLING OF SIGN FACE

GENERALLY, SIGNS MUST BE MOUNTED AT APPROXIMATELY RIGHT ANGLES TO THE DIRECTION OF TRAFFIC, FACING THE TRAFFIC THAT THEY ARE INTENDED TO ADDRESS. EXCEPTIONS TO THIS RULE INCLUDE REGULATORY PARKING CONTROL SIGNS. THESE SIGNS SHOULD BE PLACED AT AN ANGLE OF 30 TO 45 DEGREES TO THE FLOW OF TRAFFIC, AND SHOULD ALWAYS BE VISIBLE TO APPROACHING TRAFFIC.

SIGN POSTS

SIGNS SHOULD BE MOUNTED TO BREAKAWAY SIGN POSTS.

NO.	DATE	INITIAL	REVISION DETAIL

APPROVAL:

FUNCTIONAL PLAN
SOUTHBOUND PARK PLACE BOULEVARD AT MAPLEVIEW DRIVE
PROPOSED DUAL RIGHT TURNS

paradigm	PROJECT NO.: 190426	DATE: JULY 2019	SCALE: NTS	DRAWING NO.:
	DRAWN: SH	DESIGN: SH	CHECK: GP	FP 2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	474	1913	84	92	1672	46	589	168	34	48	466
v/c Ratio	1.26	0.83	0.11	0.52	0.79	0.06	0.79	0.41	0.25	0.34	1.85
Control Delay	181.8	33.1	2.2	27.8	34.5	0.2	53.0	29.2	60.1	62.4	419.0
Queue Delay	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	181.8	33.1	2.2	27.8	39.5	0.2	53.0	29.2	60.1	62.4	419.0
Queue Length 50th (m)	~77.1	150.9	0.0	9.8	131.2	0.0	72.3	23.5	8.2	11.7	~143.6
Queue Length 95th (m)	#121.1	194.7	5.8	25.5	168.7	0.0	92.4	44.4	20.5	26.0	#224.4
Internal Link Dist (m)		225.6			141.6			127.2		94.6	
Turn Bay Length (m)	160.0		175.0	50.0			50.0		60.0		
Base Capacity (vph)	375	2297	792	182	2119	726	1001	531	134	141	252
Starvation Cap Reductn	0	0	0	0	383	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	1.26	0.83	0.11	0.51	0.96	0.06	0.59	0.32	0.25	0.34	1.85

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)	460	1856	81	89	1622	45	571	65	98	33	47	452
Future Volume (vph)	460	1856	81	89	1622	45	571	65	98	33	47	452
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.91		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)	3502	4940	1578	1787	5036	1529	3467	1701		1805	1900	1615
Flt Permitted	0.95	1.00	1.00	0.08	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	4940	1578	147	5036	1529	3467	1701		1805	1900	1615
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	474	1913	84	92	1672	46	589	67	101	34	48	466
RTOR Reduction (vph)	0	0	45	0	0	27	0	45	0	0	0	132
Lane Group Flow (vph)	474	1913	39	92	1672	19	589	123	0	34	48	334
Confl. Peds. (#/hr)	3		1	1		3			2	2		
Heavy Vehicles (%)	0%	5%	1%	1%	3%	4%	1%	2%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2	6		6						4
Actuated Green, G (s)	13.0	56.5	56.5	58.9	51.2	51.2	26.2	26.2		9.0	9.0	9.0
Effective Green, g (s)	13.0	56.5	56.5	58.9	51.2	51.2	26.2	26.2		9.0	9.0	9.0
Actuated g/C Ratio	0.11	0.47	0.47	0.49	0.42	0.42	0.22	0.22		0.07	0.07	0.07
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	375	2299	734	175	2123	644	748	367		133	140	119
v/s Ratio Prot	c0.14	c0.39		0.03	0.33		c0.17	0.07		0.02	0.03	
v/s Ratio Perm			0.02	0.22		0.01						c0.21
v/c Ratio	1.26	0.83	0.05	0.53	0.79	0.03	0.79	0.34		0.26	0.34	2.80
Uniform Delay, d1	54.2	28.3	17.8	22.0	30.4	20.6	45.0	40.2		53.0	53.4	56.2
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	138.5	3.7	0.1	2.8	3.0	0.1	5.5	0.5		1.0	1.5	834.4
Delay (s)	192.7	32.0	17.9	24.8	33.4	20.6	50.5	40.8		54.1	54.9	890.6
Level of Service	F	C	B	C	C	C	D	D		D	D	F
Approach Delay (s)		62.4			32.7			48.3			765.5	
Approach LOS		E			C			D			F	

Intersection Summary

HCM 2000 Control Delay	119.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	121.4	Sum of lost time (s)	22.0
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	SBR
Lane Group Flow (vph)	474	1913	84	92	1672	46	589	168	34	48	466
v/c Ratio	0.74	0.78	0.10	0.52	0.88	0.07	0.78	0.41	0.32	0.42	0.95
Control Delay	54.8	28.6	2.1	29.4	42.0	0.2	51.8	29.0	65.1	69.2	67.0
Queue Delay	0.0	0.0	0.0	0.0	7.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.8	28.6	2.1	29.4	49.3	0.2	51.8	29.0	65.1	69.2	67.0
Queue Length 50th (m)	58.9	144.5	0.0	9.4	144.7	0.0	72.3	23.5	8.4	11.9	97.0
Queue Length 95th (m)	#87.7	187.5	5.6	25.2	#196.3	0.0	92.4	44.4	20.8	26.5	#177.0
Internal Link Dist (m)		225.6			141.6			127.2		94.6	
Turn Bay Length (m)	160.0		175.0	50.0			50.0		60.0		
Base Capacity (vph)	644	2468	842	180	1903	666	1033	546	107	113	489
Starvation Cap Reductn	0	0	0	0	209	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	0.74	0.78	0.10	0.51	0.99	0.07	0.57	0.31	0.32	0.42	0.95

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)	460	1856	81	89	1622	45	571	65	98	33	47	452
Future Volume (vph)	460	1856	81	89	1622	45	571	65	98	33	47	452
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.91		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)	3502	4940	1578	1787	5036	1529	3467	1701		1805	1900	1615
Flt Permitted	0.95	1.00	1.00	0.09	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	4940	1578	168	5036	1529	3467	1701		1805	1900	1615
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	474	1913	84	92	1672	46	589	67	101	34	48	466
RTOR Reduction (vph)	0	0	42	0	0	29	0	45	0	0	0	59
Lane Group Flow (vph)	474	1913	42	92	1672	17	589	123	0	34	48	407
Confl. Peds. (#/hr)	3		1	1		3			2	2		
Heavy Vehicles (%)	0%	5%	1%	1%	3%	4%	1%	2%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases			2	6		6						4
Actuated Green, G (s)	21.8	59.2	59.2	52.2	44.8	44.8	25.7	25.7		5.4	5.4	27.2
Effective Green, g (s)	21.8	59.2	59.2	52.2	44.8	44.8	25.7	25.7		5.4	5.4	27.2
Actuated g/C Ratio	0.18	0.49	0.49	0.44	0.37	0.37	0.21	0.21		0.05	0.05	0.23
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0
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)	637	2443	780	173	1884	572	744	365		81	85	366
v/s Ratio Prot	0.14	0.39		0.03	c0.33		c0.17	0.07		0.02	0.03	c0.20
v/s Ratio Perm			0.03	0.20		0.01						0.05
v/c Ratio	0.74	0.78	0.05	0.53	0.89	0.03	0.79	0.34		0.42	0.56	1.11
Uniform Delay, d1	46.3	25.0	15.7	22.1	35.1	23.7	44.5	39.8		55.6	56.0	46.2
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	4.7	2.6	0.1	3.1	6.7	0.1	5.8	0.6		3.5	8.3	81.1
Delay (s)	51.0	27.5	15.8	25.2	41.7	23.8	50.2	40.3		59.1	64.3	127.4
Level of Service	D	C	B	C	D	C	D	D		E	E	F
Approach Delay (s)		31.6			40.5			48.0			117.6	
Approach LOS		C			D			D			F	

Intersection Summary

HCM 2000 Control Delay	45.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	119.7	Sum of lost time (s)	22.0
Intersection Capacity Utilization	88.9%	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)	474	1913	84	92	1672	46	589	168	34	262	252
v/c Ratio	1.09	0.99	0.12	0.53	1.01	0.08	0.79	0.41	0.13	1.11	1.07
Control Delay	120.6	54.4	2.8	30.7	64.4	0.2	53.0	29.2	48.3	140.8	128.7
Queue Delay	0.0	0.0	0.0	0.0	20.5	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	120.6	54.4	2.8	30.7	84.9	0.2	53.0	29.2	48.3	140.8	128.7
Queue Length 50th (m)	~69.3	172.6	0.0	11.7	~155.5	0.0	72.3	23.5	7.5	~79.4	~74.0
Queue Length 95th (m)	#113.4	#236.4	6.6	25.3	#213.8	0.0	92.4	44.4	18.8	#148.0	#141.5
Internal Link Dist (m)		225.6			141.6			127.2		94.6	
Turn Bay Length (m)	160.0		175.0	50.0			50.0		60.0		
Base Capacity (vph)	433	1941	685	175	1662	600	1001	531	268	235	235
Starvation Cap Reductn	0	0	0	0	92	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	1.09	0.99	0.12	0.53	1.06	0.08	0.59	0.32	0.13	1.11	1.07

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)	460	1856	81	89	1622	45	571	65	98	33	47	452
Future Volume (vph)	460	1856	81	89	1622	45	571	65	98	33	47	452
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00		1.00	0.95	0.95
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.91		1.00	0.88	0.88
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)	3502	4940	1578	1787	5036	1529	3467	1701		1805	1584	1583
Flt Permitted	0.95	1.00	1.00	0.10	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	4940	1578	188	5036	1529	3467	1701		1805	1584	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	474	1913	84	92	1672	46	589	67	101	34	48	466
RTOR Reduction (vph)	0	0	51	0	0	31	0	45	0	0	0	0
Lane Group Flow (vph)	474	1913	33	92	1672	15	589	123	0	34	262	252
Confl. Peds. (#/hr)	3		1	1		3			2	2		
Heavy Vehicles (%)	0%	5%	1%	1%	3%	4%	1%	2%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2	6		6						4
Actuated Green, G (s)	15.0	47.7	47.7	47.5	40.1	40.1	26.2	26.2		18.0	18.0	18.0
Effective Green, g (s)	15.0	47.7	47.7	47.5	40.1	40.1	26.2	26.2		18.0	18.0	18.0
Actuated g/C Ratio	0.12	0.39	0.39	0.39	0.33	0.33	0.22	0.22		0.15	0.15	0.15
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	433	1942	620	171	1664	505	748	367		267	235	234
v/s Ratio Prot	c0.14	c0.39		0.03	0.33		c0.17	0.07		0.02	c0.17	
v/s Ratio Perm			0.02	0.18		0.01						0.16
v/c Ratio	1.09	0.99	0.05	0.54	1.00	0.03	0.79	0.34		0.13	1.11	1.08
Uniform Delay, d1	53.1	36.4	22.8	28.7	40.6	27.5	44.9	40.2		44.8	51.6	51.6
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	71.3	17.2	0.2	3.2	23.2	0.1	5.5	0.5		0.2	93.0	80.8
Delay (s)	124.5	53.6	23.0	31.9	63.8	27.6	50.4	40.7		45.0	144.7	132.4
Level of Service	F	D	C	C	E	C	D	D		D	F	F
Approach Delay (s)		66.2			61.3			48.3			132.9	
Approach LOS		E			E			D			F	

Intersection Summary

HCM 2000 Control Delay	68.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	121.3	Sum of lost time (s)	22.0
Intersection Capacity Utilization	90.8%	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)	474	1913	84	92	1672	46	589	168	34	262	252
v/c Ratio	1.09	0.99	0.12	0.53	1.01	0.08	0.79	0.41	0.13	1.11	0.50
Control Delay	120.6	54.4	2.8	30.7	64.4	0.2	53.0	29.2	48.3	140.8	38.3
Queue Delay	0.0	0.0	0.0	0.0	20.5	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	120.6	54.4	2.8	30.7	84.9	0.2	53.0	29.2	48.3	140.8	38.3
Queue Length 50th (m)	~69.3	172.6	0.0	11.7	~155.5	0.0	72.3	23.5	7.5	~79.4	53.5
Queue Length 95th (m)	#113.4	#236.4	6.6	25.3	#213.8	0.0	92.4	44.4	18.8	#148.0	89.1
Internal Link Dist (m)		225.6			141.6			127.2		94.6	
Turn Bay Length (m)	160.0		175.0	50.0			50.0		60.0		
Base Capacity (vph)	433	1941	685	175	1662	600	1001	531	268	235	509
Starvation Cap Reductn	0	0	0	0	92	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	1.09	0.99	0.12	0.53	1.06	0.08	0.59	0.32	0.13	1.11	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)	460	1856	81	89	1622	45	571	65	98	33	47	452
Future Volume (vph)	460	1856	81	89	1622	45	571	65	98	33	47	452
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00		1.00	0.95	0.95
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.91		1.00	0.88	0.88
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)	3502	4940	1578	1787	5036	1529	3467	1701		1805	1584	1583
Flt Permitted	0.95	1.00	1.00	0.10	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	4940	1578	188	5036	1529	3467	1701		1805	1584	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	474	1913	84	92	1672	46	589	67	101	34	48	466
RTOR Reduction (vph)	0	0	51	0	0	31	0	45	0	0	0	0
Lane Group Flow (vph)	474	1913	33	92	1672	15	589	123	0	34	262	252
Confl. Peds. (#/hr)	3		1	1		3			2	2		
Heavy Vehicles (%)	0%	5%	1%	1%	3%	4%	1%	2%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases			2	6		6						4
Actuated Green, G (s)	15.0	47.7	47.7	47.5	40.1	40.1	26.2	26.2		18.0	18.0	33.0
Effective Green, g (s)	15.0	47.7	47.7	47.5	40.1	40.1	26.2	26.2		18.0	18.0	33.0
Actuated g/C Ratio	0.12	0.39	0.39	0.39	0.33	0.33	0.22	0.22		0.15	0.15	0.27
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0
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)	433	1942	620	171	1664	505	748	367		267	235	430
v/s Ratio Prot	c0.14	c0.39		0.03	0.33		c0.17	0.07		0.02	c0.17	0.07
v/s Ratio Perm			0.02	0.18		0.01						0.09
v/c Ratio	1.09	0.99	0.05	0.54	1.00	0.03	0.79	0.34		0.13	1.11	0.59
Uniform Delay, d1	53.1	36.4	22.8	28.7	40.6	27.5	44.9	40.2		44.8	51.6	38.2
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	71.3	17.2	0.2	3.2	23.2	0.1	5.5	0.5		0.2	93.0	2.0
Delay (s)	124.5	53.6	23.0	31.9	63.8	27.6	50.4	40.7		45.0	144.7	40.3
Level of Service	F	D	C	C	E	C	D	D		D	F	D
Approach Delay (s)		66.2			61.3			48.3			90.5	
Approach LOS		E			E			D			F	

Intersection Summary

HCM 2000 Control Delay	64.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	121.3	Sum of lost time (s)	22.0
Intersection Capacity Utilization	90.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Appendix E

2026 Total Synchro Analysis

Queues

210498

3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

2026 Future Total - AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	14	1084	396	1801	3	10	167	327	22
v/c Ratio	0.08	0.42	0.71	0.63	0.02	0.08	0.61	0.79	0.02
Control Delay	5.1	9.2	59.2	7.9	27.7	48.3	14.8	48.7	27.5
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	5.1	9.2	59.2	8.1	27.7	48.3	14.8	48.7	27.5
Queue Length 50th (m)	0.4	12.7	46.5	42.2	0.5	2.2	0.0	65.2	1.5
Queue Length 95th (m)	m1.2	16.3	m57.8	92.9	2.6	7.6	15.6	90.4	5.2
Internal Link Dist (m)		85.3		118.2		85.0			175.8
Turn Bay Length (m)	70.0		65.0		20.0			40.0	
Base Capacity (vph)	175	2556	633	2842	199	310	412	416	1001
Starvation Cap Reductn	0	0	0	216	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	0.08	0.42	0.63	0.69	0.02	0.03	0.41	0.79	0.02

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis

210498

3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

2026 Future Total - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	1057	27	396	1404	397	3	10	167	327	18	4
Future Volume (vph)	14	1057	27	396	1404	397	3	10	167	327	18	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0	6.0	4.0	6.0	
Lane Util. Factor	1.00	0.86		0.97	0.91		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.99	1.00	
Frt	1.00	1.00		1.00	0.97		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	6036		3467	4816		1733	1900	1560	1742	3496	
Flt Permitted	0.09	1.00		0.95	1.00		0.74	1.00	1.00	0.54	1.00	
Satd. Flow (perm)	179	6036		3467	4816		1354	1900	1560	989	3496	
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)	14	1057	27	396	1404	397	3	10	167	327	18	4
RTOR Reduction (vph)	0	2	0	0	38	0	0	0	152	0	3	0
Lane Group Flow (vph)	14	1082	0	396	1763	0	3	10	15	327	19	0
Confl. Peds. (#/hr)	2					2	1		7	7		1
Heavy Vehicles (%)	0%	8%	3%	1%	4%	3%	4%	0%	1%	3%	0%	1%
Turn Type	pm+pt	NA		Prot	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2						8		8	4		
Actuated Green, G (s)	45.9	43.4		17.7	58.6		11.3	10.2	10.2	32.9	27.8	
Effective Green, g (s)	45.9	43.4		17.7	58.6		11.3	10.2	10.2	32.9	27.8	
Actuated g/C Ratio	0.42	0.39		0.16	0.53		0.10	0.09	0.09	0.30	0.25	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0	6.0	4.0	6.0	
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)	111	2381		557	2565		142	176	144	423	883	
v/s Ratio Prot	0.00	0.18		c0.11	c0.37		0.00	0.01		c0.13	0.01	
v/s Ratio Perm	0.05						0.00		0.01	c0.10		
v/c Ratio	0.13	0.45		0.71	0.69		0.02	0.06	0.11	0.77	0.02	
Uniform Delay, d1	19.2	24.6		43.7	18.9		44.4	45.5	45.7	33.4	30.9	
Progression Factor	0.43	0.38		1.23	0.45		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	0.6		3.4	1.2		0.1	0.1	0.3	8.5	0.0	
Delay (s)	8.8	9.8		57.0	9.7		44.4	45.6	46.1	41.9	30.9	
Level of Service	A	A		E	A		D	D	D	D	C	
Approach Delay (s)		9.8			18.3			46.0			41.2	
Approach LOS		A			B			D			D	

Intersection Summary

HCM 2000 Control Delay	19.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	1310	240	486	1440	722	757
v/c Ratio	0.74	0.42	0.96	0.49	0.72	0.88
Control Delay	30.3	7.0	44.3	9.2	38.9	45.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.3	7.0	44.3	9.2	38.9	45.7
Queue Length 50th (m)	86.9	14.7	91.8	82.4	72.6	82.2
Queue Length 95th (m)	#104.7	m7.6	#151.6	70.2	93.9	109.8
Internal Link Dist (m)	118.2			168.8		
Turn Bay Length (m)		45.0	135.0		300.0	300.0
Base Capacity (vph)	1771	565	547	2931	1071	916
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	95	0	1
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.42	0.89	0.51	0.67	0.83

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)	0	1310	240	486	1440	0	0	0	0	722	0	757
Future Volume (vph)	0	1310	240	486	1440	0	0	0	0	722	0	757
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	4.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	1.00	0.91					0.97		0.88
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		6225	1538	1626	4940					3367		2733
Flt Permitted		1.00	1.00	0.11	1.00					0.95		1.00
Satd. Flow (perm)		6225	1538	194	4940					3367		2733
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	1310	240	486	1440	0	0	0	0	722	0	757
RTOR Reduction (vph)	0	0	128	0	0	0	0	0	0	0	0	48
Lane Group Flow (vph)	0	1310	112	486	1440	0	0	0	0	722	0	709
Heavy Vehicles (%)	0%	5%	5%	11%	5%	0%	0%	0%	0%	4%	0%	4%
Turn Type		NA	Perm	pm+pt	NA					Prot		Perm
Protected Phases		2		1	6					4		
Permitted Phases			2	6								4
Actuated Green, G (s)		31.3	31.3	65.3	65.3					32.7		32.7
Effective Green, g (s)		31.3	31.3	65.3	65.3					32.7		32.7
Actuated g/C Ratio		0.28	0.28	0.59	0.59					0.30		0.30
Clearance Time (s)		6.0	6.0	4.0	6.0					6.0		6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		3.0
Lane Grp Cap (vph)		1771	437	505	2932					1000		812
v/s Ratio Prot		0.21		c0.26	0.29					0.21		
v/s Ratio Perm			0.07	c0.31								c0.26
v/c Ratio		0.74	0.26	0.96	0.49					0.72		0.87
Uniform Delay, d1		35.7	30.4	30.7	12.8					34.6		36.7
Progression Factor		0.74	0.47	0.54	0.65					1.00		1.00
Incremental Delay, d2		2.5	1.2	27.1	0.5					2.6		10.2
Delay (s)		28.9	15.5	43.7	8.8					37.2		46.9
Level of Service		C	B	D	A					D		D
Approach Delay (s)		26.8			17.6			0.0			42.1	
Approach LOS		C			B			A			D	

Intersection Summary

HCM 2000 Control Delay	27.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	334	1698	1630	774	295	317
v/c Ratio	0.69	0.46	0.61	0.69	0.57	0.68
Control Delay	40.4	4.1	5.8	8.4	46.9	41.4
Queue Delay	0.0	0.3	0.0	1.1	0.0	0.0
Total Delay	40.4	4.4	5.8	9.5	46.9	41.4
Queue Length 50th (m)	23.0	2.5	18.9	12.0	32.6	30.7
Queue Length 95th (m)	m33.5	108.3	m23.4	m46.7	43.7	44.8
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	527	3684	2665	1119	825	703
Starvation Cap Reductn	0	1077	0	154	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.65	0.61	0.80	0.36	0.45

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)	334	1698	0	0	1630	774	295	0	317	0	0	0
Future Volume (vph)	334	1698	0	0	1630	774	295	0	317	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0			6.0	6.0	6.0		6.0			
Lane Util. Factor	0.97	0.91			0.91	1.00	0.97		0.88			
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)	3213	5036			4893	1468	3242		2561			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3213	5036			4893	1468	3242		2561			
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	1698	0	0	1630	774	295	0	317	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	320	0	0	58	0	0	0
Lane Group Flow (vph)	334	1698	0	0	1630	454	295	0	259	0	0	0
Heavy Vehicles (%)	9%	3%	0%	0%	6%	10%	8%	0%	11%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Prot		Perm			
Protected Phases	5	2			6		8					
Permitted Phases						6			8			
Actuated Green, G (s)	16.6	80.5			59.9	59.9	17.5		17.5			
Effective Green, g (s)	16.6	80.5			59.9	59.9	17.5		17.5			
Actuated g/C Ratio	0.15	0.73			0.54	0.54	0.16		0.16			
Clearance Time (s)	4.0	6.0			6.0	6.0	6.0		6.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0			
Lane Grp Cap (vph)	484	3685			2664	799	515		407			
v/s Ratio Prot	c0.10	0.34			c0.33		0.09					
v/s Ratio Perm						0.31			c0.10			
v/c Ratio	0.69	0.46			0.61	0.57	0.57		0.64			
Uniform Delay, d1	44.3	6.0			17.1	16.5	42.8		43.3			
Progression Factor	0.80	0.60			0.29	2.50	1.00		1.00			
Incremental Delay, d2	2.9	0.3			0.5	1.4	1.5		3.2			
Delay (s)	38.2	3.9			5.5	42.8	44.3		46.5			
Level of Service	D	A			A	D	D		D			
Approach Delay (s)		9.5			17.5			45.5			0.0	
Approach LOS		A			B			D			A	

Intersection Summary

HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	83.3%	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)	307	1565	29	8	1977	85	223	30	39	10	205
v/c Ratio	0.51	0.52	0.03	0.03	0.96	0.12	0.56	0.14	0.27	0.07	0.65
Control Delay	64.4	4.6	0.1	6.1	27.0	0.3	51.3	25.6	51.1	45.8	16.5
Queue Delay	0.0	0.0	0.0	0.0	10.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.4	4.6	0.1	6.1	37.3	0.3	51.3	25.6	51.1	45.8	16.5
Queue Length 50th (m)	36.2	8.9	0.0	0.4	48.6	0.1	25.0	2.5	8.5	2.2	0.0
Queue Length 95th (m)	51.3	39.4	m0.0	m0.5	#225.0	m0.1	36.5	11.3	18.6	7.4	21.8
Internal Link Dist (m)		225.6			141.6			127.2		94.6	
Turn Bay Length (m)	160.0		175.0	50.0			50.0		60.0		
Base Capacity (vph)	605	3037	965	250	2058	700	1103	558	145	153	317
Starvation Cap Reductn	0	0	0	0	111	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	0.51	0.52	0.03	0.03	1.02	0.12	0.20	0.05	0.27	0.07	0.65

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)	307	1565	29	8	1977	85	223	12	18	39	10	205
Future Volume (vph)	307	1565	29	8	1977	85	223	12	18	39	10	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.91		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)	3367	4893	1476	1805	4848	1475	3467	1716		1805	1900	1599
Flt Permitted	0.95	1.00	1.00	0.15	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3367	4893	1476	287	4848	1475	3467	1716		1805	1900	1599
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)	307	1565	29	8	1977	85	223	12	18	39	10	205
RTOR Reduction (vph)	0	0	12	0	0	49	0	16	0	0	0	188
Lane Group Flow (vph)	307	1565	17	8	1977	36	223	14	0	39	10	17
Confl. Peds. (#/hr)	2		1	1		2			1	1		
Heavy Vehicles (%)	4%	6%	8%	0%	7%	8%	1%	0%	0%	0%	0%	1%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2	6		6						4
Actuated Green, G (s)	19.8	65.1	65.1	48.1	46.7	46.7	12.6	12.6		8.9	8.9	8.9
Effective Green, g (s)	19.8	65.1	65.1	48.1	46.7	46.7	12.6	12.6		8.9	8.9	8.9
Actuated g/C Ratio	0.18	0.59	0.59	0.44	0.42	0.42	0.11	0.11		0.08	0.08	0.08
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	606	2895	873	144	2058	626	397	196		146	153	129
v/s Ratio Prot	c0.09	c0.32		0.00	c0.41		c0.06	0.01		c0.02	0.01	
v/s Ratio Perm			0.01	0.02		0.02						0.01
v/c Ratio	0.51	0.54	0.02	0.06	0.96	0.06	0.56	0.07		0.27	0.07	0.13
Uniform Delay, d1	40.7	13.5	9.3	17.5	30.8	18.7	46.1	43.5		47.5	46.7	46.9
Progression Factor	1.49	0.31	1.00	0.64	0.56	0.07	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	0.7	0.0	0.1	7.7	0.1	1.8	0.2		1.0	0.2	0.5
Delay (s)	61.1	4.8	9.3	11.2	24.9	1.4	47.9	43.6		48.5	46.9	47.4
Level of Service	E	A	A	B	C	A	D	D		D	D	D
Approach Delay (s)		13.9			23.9			47.4			47.5	
Approach LOS		B			C			D			D	

Intersection Summary

HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	74.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	377	843	401	71	1524	173	85	220	150	486
v/c Ratio	0.80	0.36	0.45	0.21	0.85	0.83	0.11	0.54	0.19	0.92
Control Delay	70.1	15.2	3.3	15.5	39.0	81.8	12.0	31.4	32.1	43.0
Queue Delay	0.0	0.0	0.3	0.0	1.8	0.0	0.0	0.0	0.0	0.3
Total Delay	70.1	15.2	3.6	15.5	40.9	81.8	12.0	31.4	32.1	43.3
Queue Length 50th (m)	38.9	30.1	5.3	7.3	122.3	20.2	2.4	35.0	13.8	55.2
Queue Length 95th (m)	#68.8	29.4	17.9	15.9	#164.3	#39.5	8.3	51.4	21.3	#109.7
Internal Link Dist (m)		141.6			238.0		219.7		226.0	
Turn Bay Length (m)	70.0		50.0	120.0		95.0		110.0		45.0
Base Capacity (vph)	481	2317	892	341	1799	208	968	405	981	602
Starvation Cap Reductn	0	0	131	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	144	0	0	0	0	7
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.36	0.53	0.21	0.92	0.83	0.09	0.54	0.15	0.82

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)	377	843	401	71	1412	112	173	27	58	220	150	486
Future Volume (vph)	377	843	401	71	1412	112	173	27	58	220	150	486
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3213	4988	1458	1718	4910		3019	3093		1626	3252	1417
Flt Permitted	0.95	1.00	1.00	0.32	1.00		0.95	1.00		0.60	1.00	1.00
Satd. Flow (perm)	3213	4988	1458	584	4910		3019	3093		1021	3252	1417
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)	377	843	401	71	1412	112	173	27	58	220	150	486
RTOR Reduction (vph)	0	0	222	0	8	0	0	46	0	0	0	188
Lane Group Flow (vph)	377	843	179	71	1516	0	173	39	0	220	150	298
Confl. Peds. (#/hr)	1		3	3		1						
Heavy Vehicles (%)	9%	4%	9%	5%	4%	9%	16%	15%	0%	11%	11%	14%
Turn Type	Prot	NA	Perm	pm+pt	NA		Prot	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)	16.1	49.2	49.2	44.9	39.0		7.6	23.3		38.9	27.3	27.3
Effective Green, g (s)	16.1	49.2	49.2	44.9	39.0		7.6	23.3		38.9	27.3	27.3
Actuated g/C Ratio	0.15	0.45	0.45	0.41	0.35		0.07	0.21		0.35	0.25	0.25
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
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)	470	2230	652	299	1740		208	655		424	807	351
v/s Ratio Prot	c0.12	0.17		0.01	c0.31		c0.06	0.01		c0.05	0.05	
v/s Ratio Perm			0.12	0.08						0.13		c0.21
v/c Ratio	0.80	0.38	0.28	0.24	0.87		0.83	0.06		0.52	0.19	0.85
Uniform Delay, d1	45.4	20.2	19.2	20.1	33.2		50.6	34.6		26.7	32.6	39.4
Progression Factor	1.28	0.70	0.74	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	8.4	0.4	0.9	0.4	6.3		23.7	0.0		1.1	0.1	17.1
Delay (s)	66.5	14.6	15.2	20.5	39.5		74.3	34.6		27.7	32.7	56.5
Level of Service	E	B	B	C	D		E	C		C	C	E
Approach Delay (s)		26.8			38.6			61.2			45.0	
Approach LOS		C			D			E			D	

Intersection Summary

HCM 2000 Control Delay	36.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	81	14	5	57	459	6	850
v/c Ratio	0.24	0.11	0.01	0.13	0.17	0.01	0.38
Control Delay	17.2	36.8	0.0	3.9	4.9	3.7	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.2	36.8	0.0	3.9	4.9	3.7	8.7
Queue Length 50th (m)	1.5	2.4	0.0	1.8	9.8	0.3	36.3
Queue Length 95th (m)	9.3	8.0	0.0	7.0	32.0	1.5	65.8
Internal Link Dist (m)	115.4		50.9		226.0		199.1
Turn Bay Length (m)				70.0		50.0	
Base Capacity (vph)	738	126	763	446	2636	780	2254
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.11	0.01	0.13	0.17	0.01	0.38

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	0	39	14	0	5	57	442	17	6	803	47
Future Volume (vph)	42	0	39	14	0	5	57	442	17	6	803	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor		0.95		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.93		1.00	0.85		1.00	0.99		1.00	0.99	
Flt Protected		0.97		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3128		1203	1615		1517	3394		1805	3185	
Flt Permitted		0.82		0.46	1.00		0.29	1.00		0.49	1.00	
Satd. Flow (perm)		2644		587	1615		461	3394		927	3185	
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	0	39	14	0	5	57	442	17	6	803	47
RTOR Reduction (vph)	0	59	0	0	4	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	22	0	14	1	0	57	458	0	6	848	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	1%	0%	8%	50%	0%	0%	19%	6%	0%	0%	13%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		7.8		13.1	13.1		77.2	71.9		69.1	67.8	
Effective Green, g (s)		7.8		13.1	13.1		77.2	71.9		69.1	67.8	
Actuated g/C Ratio		0.08		0.13	0.13		0.75	0.70		0.68	0.66	
Clearance Time (s)		6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		201		82	206		403	2385		637	2110	
v/s Ratio Prot				c0.00	0.00		c0.01	0.13		0.00	c0.27	
v/s Ratio Perm		0.01		c0.02			0.10			0.01		
v/c Ratio		0.11		0.17	0.00		0.14	0.19		0.01	0.40	
Uniform Delay, d1		44.0		39.4	38.9		3.7	5.2		5.4	7.9	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2		1.0	0.0		0.2	0.2		0.0	0.6	
Delay (s)		44.3		40.4	38.9		3.8	5.4		5.4	8.5	
Level of Service		D		D	D		A	A		A	A	
Approach Delay (s)		44.3			40.0			5.2			8.5	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	102.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	WBL	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	45	27	4	47	442	4	875
v/c Ratio	0.21	0.07	0.03	0.08	0.16	0.00	0.34
Control Delay	38.0	0.4	45.0	3.4	4.4	3.5	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.0	0.4	45.0	3.4	4.4	3.5	7.2
Queue Length 50th (m)	7.9	0.0	0.7	1.5	9.4	0.2	37.4
Queue Length 95th (m)	18.0	0.0	4.5	6.0	31.0	1.2	67.5
Internal Link Dist (m)					199.1		252.7
Turn Bay Length (m)	25.0			70.0		70.0	
Base Capacity (vph)	234	457	161	588	2810	848	2546
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.06	0.02	0.08	0.16	0.00	0.34

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	0	27	4	0	0	47	442	0	4	825	50
Future Volume (vph)	45	0	27	4	0	0	47	442	0	4	825	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		6.0	4.0			4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00		1.00	1.00			1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Frt	1.00		0.85	1.00			1.00	1.00		1.00	0.99	
Flt Protected	0.95		1.00	0.95			0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1687		961	1805			1805	3406		1805	3271	
Flt Permitted	0.95		1.00	0.00			0.29	1.00		0.50	1.00	
Satd. Flow (perm)	1687		961	0			555	3406		942	3271	
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)	45	0	27	4	0	0	47	442	0	4	825	50
RTOR Reduction (vph)	0	0	26	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	45	0	1	4	0	0	47	442	0	4	873	0
Confl. Peds. (#/hr)	1											
Heavy Vehicles (%)	7%	0%	68%	0%	0%	0%	0%	6%	0%	0%	10%	0%
Turn Type	pm+pt		Perm	pm+pt			pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	12.7		5.5	1.2			76.2	72.3		70.8	69.6	
Effective Green, g (s)	12.7		5.5	1.2			76.2	72.3		70.8	69.6	
Actuated g/C Ratio	0.13		0.05	0.01			0.76	0.72		0.71	0.69	
Clearance Time (s)	4.0		6.0	4.0			4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0			3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	213		52	21			470	2457		675	2272	
v/s Ratio Prot	c0.03			0.00			c0.00	0.13		0.00	c0.27	
v/s Ratio Perm			0.00				0.07			0.00		
v/c Ratio	0.21		0.03	0.19			0.10	0.18		0.01	0.38	
Uniform Delay, d1	39.3		44.8	49.0			3.2	4.5		4.3	6.4	
Progression Factor	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5		0.2	4.4			0.1	0.2		0.0	0.5	
Delay (s)	39.8		45.0	53.4			3.3	4.6		4.3	6.9	
Level of Service	D		D	D			A	A		A	A	
Approach Delay (s)		41.7			53.4			4.5			6.9	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	100.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	44	26	17	178	30	416	63	875
v/c Ratio	0.21	0.05	0.07	0.31	0.11	0.20	0.10	0.41
Control Delay	35.2	0.2	32.8	1.4	6.0	10.0	5.3	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	0.2	32.8	1.4	6.0	10.0	5.3	11.2
Queue Length 50th (m)	7.5	0.0	2.9	0.0	1.8	21.5	3.8	53.7
Queue Length 95th (m)	17.2	0.0	8.7	0.0	4.8	31.5	8.1	72.1
Internal Link Dist (m)				203.0		252.7		204.9
Turn Bay Length (m)	50.0	50.0	30.0		70.0		65.0	
Base Capacity (vph)	226	620	261	682	289	2095	673	2113
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	0.19	0.04	0.07	0.26	0.10	0.20	0.09	0.41

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	0	26	17	0	178	30	415	1	63	836	39
Future Volume (vph)	44	0	26	17	0	178	30	415	1	63	836	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00		1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00		0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00		0.85	1.00	0.85		1.00	1.00		1.00	0.99	
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805		1593	1734	1346		1031	3404		1624	3300	
Flt Permitted	0.34		1.00	0.76	1.00		0.29	1.00		0.50	1.00	
Satd. Flow (perm)	647		1593	1382	1346		317	3404		849	3300	
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)	44	0	26	17	0	178	30	415	1	63	836	39
RTOR Reduction (vph)	0	0	23	0	159	0	0	0	0	0	2	0
Lane Group Flow (vph)	44	0	3	17	19	0	30	416	0	63	873	0
Confl. Peds. (#/hr)			1	1			5		4	4		5
Heavy Vehicles (%)	0%	0%	0%	4%	0%	20%	75%	6%	4%	11%	9%	0%
Turn Type	pm+pt		Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	17.6		12.9	13.6	10.9		65.7	61.6		68.7	63.1	
Effective Green, g (s)	17.6		12.9	13.6	10.9		65.7	61.6		68.7	63.1	
Actuated g/C Ratio	0.17		0.13	0.13	0.11		0.64	0.60		0.67	0.61	
Clearance Time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	163		199	192	142		231	2039		609	2025	
v/s Ratio Prot	c0.01			0.00	0.01		0.01	0.12		c0.01	c0.26	
v/s Ratio Perm	c0.03		0.00	0.01			0.08			0.06		
v/c Ratio	0.27		0.02	0.09	0.13		0.13	0.20		0.10	0.43	
Uniform Delay, d1	36.4		39.4	39.1	41.7		7.1	9.4		5.9	10.4	
Progression Factor	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9		0.0	0.2	0.4		0.3	0.2		0.1	0.7	
Delay (s)	37.3		39.4	39.3	42.1		7.4	9.6		6.0	11.1	
Level of Service	D		D	D	D		A	A		A	B	
Approach Delay (s)		38.1			41.8			9.5			10.8	
Approach LOS		D			D			A			B	

Intersection Summary

HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	102.8	Sum of lost time (s)	20.0
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	0	3	12	0	5	9	562	47	12	776	26
Future Volume (Veh/h)	6	0	3	12	0	5	9	562	47	12	776	26
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	6	0	3	12	0	5	9	562	47	12	776	26
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								229				
pX, platoon unblocked	0.98	0.98		0.98	0.98	0.98				0.98		
vC, conflicting volume	1117	1440	401	1018	1430	304	802			609		
vC1, stage 1 conf vol	813	813		604	604							
vC2, stage 2 conf vol	304	627		415	826							
vCu, unblocked vol	1081	1410	401	981	1399	253	802			563		
tC, single (s)	7.5	6.5	6.9	8.3	6.5	6.9	4.1			4.2		
tC, 2 stage (s)	6.5	5.5		7.3	5.5							
tF (s)	3.5	4.0	3.3	3.9	4.0	3.3	2.2			2.3		
p0 queue free %	98	100	99	96	100	99	99			99		
cM capacity (veh/h)	314	316	599	323	314	739	817			959		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	9	17	9	375	234	12	517	285
Volume Left	6	12	9	0	0	12	0	0
Volume Right	3	5	0	0	47	0	0	26
cSH	373	387	817	1700	1700	959	1700	1700
Volume to Capacity	0.02	0.04	0.01	0.22	0.14	0.01	0.30	0.17
Queue Length 95th (m)	0.6	1.1	0.3	0.0	0.0	0.3	0.0	0.0
Control Delay (s)	14.9	14.7	9.5	0.0	0.0	8.8	0.0	0.0
Lane LOS	B	B	A			A		
Approach Delay (s)	14.9	14.7	0.1			0.1		
Approach LOS	B	B						

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	32.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	27	25	102	470	789	113
Future Volume (Veh/h)	27	25	102	470	789	113
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	27	25	102	470	789	113
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)					276	
pX, platoon unblocked						
vC, conflicting volume	1284	451	902			
vC1, stage 1 conf vol	846					
vC2, stage 2 conf vol	439					
vCu, unblocked vol	1284	451	902			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	92	96	87			
cM capacity (veh/h)	331	561	762			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	27	25	102	235	235	526	376
Volume Left	27	0	102	0	0	0	0
Volume Right	0	25	0	0	0	0	113
cSH	331	561	762	1700	1700	1700	1700
Volume to Capacity	0.08	0.04	0.13	0.14	0.14	0.31	0.22
Queue Length 95th (m)	2.1	1.1	3.7	0.0	0.0	0.0	0.0
Control Delay (s)	16.8	11.7	10.5	0.0	0.0	0.0	0.0
Lane LOS	C	B	B				
Approach Delay (s)	14.4		1.9			0.0	
Approach LOS	B						

Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	44.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	6	25	462	884	26
Future Volume (Veh/h)	9	6	25	462	884	26
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	9	6	25	462	884	26
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)					122	
pX, platoon unblocked	0.96	0.96	0.96			
vC, conflicting volume	1178	455	910			
vC1, stage 1 conf vol	897					
vC2, stage 2 conf vol	281					
vCu, unblocked vol	1110	360	832			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	99	97			
cM capacity (veh/h)	359	620	780			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	15	25	231	231	589	321
Volume Left	9	25	0	0	0	0
Volume Right	6	0	0	0	0	26
cSH	432	780	1700	1700	1700	1700
Volume to Capacity	0.03	0.03	0.14	0.14	0.35	0.19
Queue Length 95th (m)	0.9	0.8	0.0	0.0	0.0	0.0
Control Delay (s)	13.6	9.8	0.0	0.0	0.0	0.0
Lane LOS	B	A				
Approach Delay (s)	13.6	0.5			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	35.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	186	572	442	248	557	215	103	360	52	218	176
v/c Ratio	0.46	0.51	0.64	0.57	0.48	0.34	0.25	0.35	0.14	0.22	0.38
Control Delay	18.4	31.5	15.2	20.3	29.4	10.5	22.6	29.1	21.2	30.2	7.3
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	18.4	31.5	15.2	20.3	29.4	10.5	22.6	29.1	21.2	30.2	7.3
Queue Length 50th (m)	21.4	53.1	26.6	29.6	50.1	9.8	14.0	31.0	6.8	19.1	0.0
Queue Length 95th (m)	35.0	74.2	65.6	45.8	69.3	29.1	27.2	46.7	15.7	30.5	17.2
Internal Link Dist (m)		843.7			279.6			97.5		104.6	
Turn Bay Length (m)	25.0		25.0	40.0		25.0	100.0		40.0		50.0
Base Capacity (vph)	451	1400	801	487	1468	759	415	1034	374	977	458
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	0.41	0.41	0.55	0.51	0.38	0.28	0.25	0.35	0.14	0.22	0.38

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	186	572	442	248	557	215	103	294	66	52	218	176
Future Volume (vph)	186	572	442	248	557	215	103	294	66	52	218	176
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		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)	1641	3406	1538	1736	3343	1538	1595	3278		1610	3374	1152
Flt Permitted	0.37	1.00	1.00	0.31	1.00	1.00	0.59	1.00		0.52	1.00	1.00
Satd. Flow (perm)	642	3406	1538	568	3343	1538	987	3278		874	3374	1152
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	572	442	248	557	215	103	294	66	52	218	176
RTOR Reduction (vph)	0	0	194	0	0	98	0	15	0	0	0	124
Lane Group Flow (vph)	186	572	248	248	557	117	103	345	0	52	218	52
Confl. Peds. (#/hr)							3		2	2		3
Heavy Vehicles (%)	10%	6%	5%	4%	8%	5%	13%	7%	6%	12%	7%	38%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	46.9	35.0	35.0	51.1	37.1	37.1	40.3	33.3		37.3	31.8	31.8
Effective Green, g (s)	46.9	35.0	35.0	51.1	37.1	37.1	40.3	33.3		37.3	31.8	31.8
Actuated g/C Ratio	0.44	0.32	0.32	0.47	0.34	0.34	0.37	0.31		0.35	0.29	0.29
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	6.0
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)	389	1105	499	420	1150	529	408	1012		339	995	339
v/s Ratio Prot	0.05	0.17		c0.08	0.17		c0.02	c0.11		0.01	0.06	
v/s Ratio Perm	0.15		0.16	c0.20		0.08	0.08			0.05		0.05
v/c Ratio	0.48	0.52	0.50	0.59	0.48	0.22	0.25	0.34		0.15	0.22	0.15
Uniform Delay, d1	19.6	29.5	29.3	18.2	27.8	25.1	22.6	28.8		23.8	28.6	28.1
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	0.9	0.4	0.8	2.2	0.3	0.2	0.3	0.9		0.2	0.5	1.0
Delay (s)	20.5	30.0	30.1	20.4	28.1	25.3	22.9	29.7		24.0	29.1	29.0
Level of Service	C	C	C	C	C	C	C	C		C	C	C
Approach Delay (s)		28.5			25.7			28.2			28.5	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	107.8	Sum of lost time (s)	20.0
Intersection Capacity Utilization	85.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	58	1088	382	1030	70	114	21	137
v/c Ratio	0.16	0.48	0.70	0.34	0.32	0.24	0.10	0.38
Control Delay	9.1	22.8	41.0	3.8	39.9	14.7	35.5	29.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.1	22.8	41.0	3.8	39.9	14.7	35.5	29.4
Queue Length 50th (m)	3.4	63.1	44.2	7.8	13.1	1.9	3.8	8.4
Queue Length 95th (m)	7.4	85.8	93.2	15.8	25.8	11.1	10.7	18.3
Internal Link Dist (m)		279.4		63.9		107.8		187.7
Turn Bay Length (m)	60.0		25.0		45.0		50.0	
Base Capacity (vph)	365	2249	565	3065	217	772	217	850
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	0.16	0.48	0.68	0.34	0.32	0.15	0.10	0.16

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	983	105	382	944	86	70	20	94	21	75	62
Future Volume (vph)	58	983	105	382	944	86	70	20	94	21	75	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.88		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	4874		1752	4836		1656	2860		1570	3275	
Flt Permitted	0.27	1.00		0.18	1.00		0.53	1.00		0.68	1.00	
Satd. Flow (perm)	505	4874		323	4836		918	2860		1123	3275	
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)	58	983	105	382	944	86	70	20	94	21	75	62
RTOR Reduction (vph)	0	10	0	0	7	0	0	81	0	0	55	0
Lane Group Flow (vph)	58	1078	0	382	1023	0	70	33	0	21	82	0
Confl. Peds. (#/hr)			5	5								
Heavy Vehicles (%)	0%	5%	2%	3%	6%	5%	9%	4%	12%	15%	5%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	53.8	48.1		76.1	66.4		21.0	14.9		14.8	11.8	
Effective Green, g (s)	53.8	48.1		76.1	66.4		21.0	14.9		14.8	11.8	
Actuated g/C Ratio	0.49	0.44		0.69	0.60		0.19	0.14		0.13	0.11	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	314	2131		535	2919		216	387		163	351	
v/s Ratio Prot	0.01	0.22		c0.16	0.21		c0.02	0.01		0.00	0.02	
v/s Ratio Perm	0.08			c0.34			c0.04			0.01		
v/c Ratio	0.18	0.51		0.71	0.35		0.32	0.08		0.13	0.23	
Uniform Delay, d1	14.8	22.4		14.9	11.0		37.6	41.6		41.8	45.0	
Progression Factor	1.00	1.00		2.95	0.34		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.9		3.5	0.3		0.9	0.1		0.4	0.3	
Delay (s)	15.1	23.2		47.5	4.0		38.5	41.7		42.1	45.3	
Level of Service	B	C		D	A		D	D		D	D	
Approach Delay (s)		22.8			15.8			40.5			44.9	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	21.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	75.3%	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)	6	397	7	49	201	147	10	105	97	105	252	77
v/c Ratio	0.01	0.26	0.01	0.12	0.13	0.19	0.02	0.06	0.12	0.18	0.15	0.10
Control Delay	19.7	22.3	0.0	21.6	20.7	3.9	17.5	17.8	3.9	19.6	18.7	4.2
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	19.7	22.3	0.0	21.6	20.7	3.9	17.5	17.8	3.9	19.6	18.7	4.2
Queue Length 50th (m)	0.8	32.4	0.0	7.2	15.4	0.0	1.3	7.3	0.0	14.8	18.4	0.0
Queue Length 95th (m)	3.5	44.1	0.2	15.7	23.4	12.1	4.5	12.6	9.4	26.5	26.8	8.5
Internal Link Dist (m)		272.9			843.7			269.3			198.7	
Turn Bay Length (m)	60.0		60.0	60.0		60.0	60.0		60.0	60.0		60.0
Base Capacity (vph)	505	1533	701	394	1533	769	518	1651	790	596	1651	779
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	0.01	0.26	0.01	0.12	0.13	0.19	0.02	0.06	0.12	0.18	0.15	0.10

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	397	7	49	201	147	10	105	97	105	252	77
Future Volume (vph)	6	397	7	49	201	147	10	105	97	105	252	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	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)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.63	1.00	1.00	0.49	1.00	1.00	0.60	1.00	1.00	0.69	1.00	1.00
Satd. Flow (perm)	1165	3539	1583	910	3539	1583	1110	3539	1583	1277	3539	1583
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)	6	397	7	49	201	147	10	105	97	105	252	77
RTOR Reduction (vph)	0	0	4	0	0	83	0	0	52	0	0	41
Lane Group Flow (vph)	6	397	3	49	201	64	10	105	45	105	252	36
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	52.0	52.0	52.0	52.0	52.0	52.0	56.0	56.0	56.0	56.0	56.0	56.0
Effective Green, g (s)	52.0	52.0	52.0	52.0	52.0	52.0	56.0	56.0	56.0	56.0	56.0	56.0
Actuated g/C Ratio	0.43	0.43	0.43	0.43	0.43	0.43	0.47	0.47	0.47	0.47	0.47	0.47
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Grp Cap (vph)	504	1533	685	394	1533	685	518	1651	738	595	1651	738
v/s Ratio Prot		c0.11			0.06			0.03			0.07	
v/s Ratio Perm	0.01		0.00	0.05		0.04	0.01		0.03	c0.08		0.02
v/c Ratio	0.01	0.26	0.00	0.12	0.13	0.09	0.02	0.06	0.06	0.18	0.15	0.05
Uniform Delay, d1	19.4	21.7	19.3	20.4	20.4	20.1	17.2	17.6	17.6	18.6	18.4	17.5
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	0.0	0.4	0.0	0.6	0.2	0.3	0.1	0.1	0.2	0.6	0.2	0.1
Delay (s)	19.4	22.1	19.3	21.0	20.6	20.3	17.3	17.7	17.7	19.2	18.6	17.6
Level of Service	B	C	B	C	C	C	B	B	B	B	B	B
Approach Delay (s)		22.0			20.6			17.7			18.6	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.22		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	42.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	B38	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	TR	T	L	L	T	T	TR	L
Maximum Queue (m)	13.9	74.0	77.2	62.2	81.1	1.4	67.2	69.1	84.1	92.1	103.2	7.0
Average Queue (m)	3.2	26.0	28.9	19.2	28.9	0.0	36.0	42.9	32.5	42.3	56.1	0.4
95th Queue (m)	10.5	57.4	59.1	47.2	61.2	1.0	55.0	60.0	61.1	76.1	89.3	3.5
Link Distance (m)		86.5	86.5	86.5	86.5	66.0			114.0	114.0	114.0	
Upstream Blk Time (%)		0	0	0	0						0	
Queuing Penalty (veh)		0	0	0	0						0	
Storage Bay Dist (m)	70.0						65.0	65.0				20.0
Storage Blk Time (%)		1					0	1	0			
Queuing Penalty (veh)		0					0	3	1			

Intersection: 3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

Movement	NB	NB	SB	SB	SB
Directions Served	T	R	L	T	TR
Maximum Queue (m)	11.1	39.5	47.4	117.4	63.1
Average Queue (m)	2.5	19.9	43.4	57.6	7.0
95th Queue (m)	8.9	35.6	54.5	151.8	42.2
Link Distance (m)	85.8	85.8		180.4	180.4
Upstream Blk Time (%)				7	
Queuing Penalty (veh)				0	
Storage Bay Dist (m)			40.0		
Storage Blk Time (%)	0		37	0	
Queuing Penalty (veh)	0		3	1	

Intersection: 6: Mapleview Drive W & Highway 400 SB Off-Ramp

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	T	R	L	T	T	T	L	L	R
Maximum Queue (m)	118.0	118.9	110.7	102.1	80.4	127.0	91.8	74.1	74.2	307.5	356.9	351.2
Average Queue (m)	71.3	76.8	59.9	49.9	21.1	60.1	32.9	27.2	36.8	260.1	287.2	211.0
95th Queue (m)	125.9	124.5	104.0	87.0	58.3	107.6	63.8	50.7	61.6	367.1	408.2	407.3
Link Distance (m)	114.0	114.0	114.0	114.0			168.4	168.4	168.4		326.9	326.9
Upstream Blk Time (%)	1	2	0	0			0				29	9
Queuing Penalty (veh)	5	6	1	0			0				0	0
Storage Bay Dist (m)					45.0	135.0				300.0		
Storage Blk Time (%)				11	0	0				5	38	9
Queuing Penalty (veh)				26	0	1				19	135	32

Intersection: 6: Mapleview Drive W & Highway 400 SB Off-Ramp

Movement	SB	B36	B36
Directions Served	R	T	T
Maximum Queue (m)	307.5	133.0	125.6
Average Queue (m)	170.7	40.6	35.7
95th Queue (m)	353.9	143.0	138.8
Link Distance (m)		176.9	176.9
Upstream Blk Time (%)		4	3
Queuing Penalty (veh)		0	0
Storage Bay Dist (m)	300.0		
Storage Blk Time (%)	0		
Queuing Penalty (veh)	2		

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (m)	58.5	65.6	129.8	113.7	80.9	159.7	69.9	80.8	82.8	67.0	55.0	75.3
Average Queue (m)	27.8	28.8	16.8	14.2	14.8	67.2	21.2	26.4	52.2	30.8	26.0	32.1
95th Queue (m)	50.6	53.5	69.7	60.2	54.2	127.2	46.0	56.9	76.6	54.3	46.9	57.9
Link Distance (m)		168.4	168.4	168.4	168.4	218.3	218.3	218.3			335.8	335.8
Upstream Blk Time (%)			0	0		0						
Queuing Penalty (veh)			0	0		0						
Storage Bay Dist (m)	130.0								130.0	265.0		
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	NB
Directions Served	R
Maximum Queue (m)	59.9
Average Queue (m)	19.0
95th Queue (m)	45.1
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	265.0
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	L
Maximum Queue (m)	57.2	61.1	66.4	54.7	81.5	14.0	37.4	138.9	144.4	150.3	167.0	42.7
Average Queue (m)	31.9	37.4	29.2	28.2	43.8	2.2	2.7	100.0	108.5	127.6	83.5	16.2
95th Queue (m)	49.3	54.0	51.3	47.9	67.4	8.9	18.4	155.6	155.4	160.1	203.1	35.1
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)								3	2	14	6	
Queuing Penalty (veh)								14	8	74	30	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)								31				0
Queuing Penalty (veh)								2				0

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R
Maximum Queue (m)	62.0	16.6	21.2	10.7	53.7
Average Queue (m)	28.5	4.7	8.3	2.2	27.1
95th Queue (m)	49.8	12.6	17.4	7.8	46.0
Link Distance (m)	128.7	128.7		96.0	96.0
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)			60.0		
Storage Blk Time (%)	1				
Queuing Penalty (veh)	1				

Intersection: 15: Bayview Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	T	R	L	T	T	TR	L	L
Maximum Queue (m)	70.5	74.5	32.2	35.5	40.4	76.8	119.9	248.9	260.4	260.0	70.3	83.8
Average Queue (m)	41.5	43.2	11.1	17.2	20.1	30.4	15.1	157.1	206.1	221.4	26.9	43.3
95th Queue (m)	61.8	63.9	25.2	30.6	35.6	57.5	59.7	279.8	317.5	313.6	58.5	75.0
Link Distance (m)			131.2	131.2	131.2			244.4	244.4	244.4		
Upstream Blk Time (%)								3	26	57		
Queuing Penalty (veh)								0	0	0		
Storage Bay Dist (m)	70.0	70.0				50.0	120.0				95.0	95.0
Storage Blk Time (%)	0	1			0	2		4			0	0
Queuing Penalty (veh)	1	3			0	6		3			0	0

Intersection: 15: Bayview Drive & Mapleview Drive W

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	TR	L	T	T	R
Maximum Queue (m)	19.8	21.0	104.6	105.4	140.7	80.0
Average Queue (m)	4.5	8.3	54.9	23.6	40.9	52.9
95th Queue (m)	13.4	17.5	96.0	66.2	110.1	95.2
Link Distance (m)	218.2	218.2		214.5	214.5	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			110.0			45.0
Storage Blk Time (%)			2		0	18
Queuing Penalty (veh)			2		2	14

Intersection: 18: Bayview Drive & South Village Way/Barrie Molson Centre D/W

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	24.3	18.0	20.4	9.1	33.1	46.1	48.7	8.1	67.5	115.6
Average Queue (m)	10.2	7.5	3.9	1.2	10.0	10.8	11.9	0.6	18.8	41.8
95th Queue (m)	20.0	16.6	14.2	6.3	24.7	32.7	34.8	3.9	46.0	88.4
Link Distance (m)	126.0	126.0	60.2	60.2		214.5	214.5		195.2	195.2
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)					70.0			50.0		
Storage Blk Time (%)									1	
Queuing Penalty (veh)									0	

Intersection: 21: Bayview Drive & North Village Way/Private D/W

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	L	T	TR	L	T	TR
Maximum Queue (m)	29.0	28.9	10.2	25.6	39.0	41.7	6.3	62.9	88.2
Average Queue (m)	9.2	9.4	1.5	7.5	8.6	8.9	0.4	16.8	28.7
95th Queue (m)	21.5	24.7	7.1	18.5	27.8	28.5	3.3	44.8	63.4
Link Distance (m)		71.5	75.9		195.2	195.2		247.7	247.7
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (m)	25.0			70.0			70.0		
Storage Blk Time (%)	2								
Queuing Penalty (veh)	0								

Intersection: 24: Bayview Drive & Concert Way/Churchill Drive

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	24.2	13.9	14.2	43.1	29.5	41.5	41.7	20.1	64.4	81.9
Average Queue (m)	9.4	4.8	3.7	21.4	8.8	13.1	10.9	7.2	23.5	33.1
95th Queue (m)	20.3	12.4	11.3	35.2	22.6	32.4	28.8	16.8	49.4	65.2
Link Distance (m)				212.1		247.7	247.7		206.4	206.4
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	50.0	50.0	30.0		70.0			65.0		
Storage Blk Time (%)				2					0	
Queuing Penalty (veh)				0					0	

Intersection: 28: Bayview Drive & Industrial Site D/W - South/Coca-Cola D/W

Movement	EB	WB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	L	T	TR
Maximum Queue (m)	13.0	28.5	8.2	0.9	9.1	1.5	2.4
Average Queue (m)	2.5	6.4	0.9	0.0	1.2	0.0	0.1
95th Queue (m)	9.4	19.4	5.0	0.7	6.1	1.1	1.7
Link Distance (m)	169.7	182.1		206.4		206.3	206.3
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			15.0		15.0		
Storage Blk Time (%)					0		
Queuing Penalty (veh)					0		

Intersection: 29: Bayview Drive & Medical Centre South D/W - Industrial Site D/W North

Movement	EB	EB	NB	NB	SB
Directions Served	L	R	L	T	TR
Maximum Queue (m)	15.4	13.2	20.6	17.2	8.4
Average Queue (m)	6.1	5.6	10.3	0.6	0.7
95th Queue (m)	14.7	12.9	17.9	7.2	4.4
Link Distance (m)	102.1	102.1		206.3	137.8
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)			15.0		
Storage Blk Time (%)			4		
Queuing Penalty (veh)			9		

Intersection: 31: Bayview Drive & Medical Centre North D/W

Movement	EB	NB	NB
Directions Served	LR	L	T
Maximum Queue (m)	12.7	14.8	1.8
Average Queue (m)	4.1	4.6	0.1
95th Queue (m)	12.1	13.1	1.3
Link Distance (m)	108.5		137.8
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)		15.0	
Storage Blk Time (%)		1	
Queuing Penalty (veh)		1	

Intersection: 33: Bayview Drive & Big Bay Point Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	TR	L
Maximum Queue (m)	65.0	81.2	91.5	71.9	68.3	77.8	75.5	48.4	47.0	74.1	66.8	28.6
Average Queue (m)	25.6	43.4	44.2	33.1	34.6	41.7	38.2	15.0	19.4	39.3	25.0	10.4
95th Queue (m)	48.1	68.7	72.5	60.7	60.1	66.4	62.6	30.6	37.2	68.0	56.1	23.5
Link Distance (m)		835.0	835.0			287.9	287.9			92.4	92.4	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	25.0			25.0	40.0			25.0	100.0			40.0
Storage Blk Time (%)	9	25	26	14	8	9	19	1				
Queuing Penalty (veh)	26	47	116	40	21	24	40	2				

Intersection: 33: Bayview Drive & Big Bay Point Road

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (m)	45.7	36.1	54.7
Average Queue (m)	24.2	17.0	21.9
95th Queue (m)	40.5	34.1	42.1
Link Distance (m)	101.3	101.3	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			50.0
Storage Blk Time (%)	1		0
Queuing Penalty (veh)	1		0

Intersection: 39: Bryne Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	B38	NB	NB	NB
Directions Served	L	T	T	TR	L	T	T	TR	T	L	T	TR
Maximum Queue (m)	19.0	81.5	84.7	100.3	32.3	87.6	66.4	41.7	14.7	40.9	19.9	26.6
Average Queue (m)	8.5	36.1	46.2	47.4	30.7	47.8	24.4	20.3	1.6	16.8	4.7	9.7
95th Queue (m)	17.1	64.8	73.3	80.8	36.3	95.9	55.6	38.0	10.8	32.3	13.9	20.7
Link Distance (m)		286.7	286.7	286.7		66.0	66.0	66.0	86.5		103.6	103.6
Upstream Blk Time (%)						8	0					
Queuing Penalty (veh)						40	1					
Storage Bay Dist (m)	60.0				25.0					45.0		
Storage Blk Time (%)		1			40	0				0		
Queuing Penalty (veh)		0			126	2				0		

Intersection: 39: Bryne Drive & Mapleview Drive W

Movement	SB	SB	SB
Directions Served	L	T	TR
Maximum Queue (m)	17.7	39.3	20.7
Average Queue (m)	5.3	17.9	8.8
95th Queue (m)	14.2	32.9	16.2
Link Distance (m)		194.0	194.0
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)	50.0		
Storage Blk Time (%)		0	
Queuing Penalty (veh)		0	

Intersection: 43: Big Bay Point Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	R
Maximum Queue (m)	9.2	50.2	44.7	9.1	26.8	35.5	38.7	27.7	12.5	28.2	11.8	18.7
Average Queue (m)	1.4	29.2	21.2	0.8	9.5	12.3	15.6	12.7	1.9	13.2	2.3	5.5
95th Queue (m)	6.9	47.4	41.7	5.1	22.5	27.4	31.9	23.3	7.7	24.0	7.9	12.9
Link Distance (m)		280.6	280.6			835.0	835.0			273.9	273.9	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	60.0			60.0	60.0			60.0	60.0			60.0
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 43: Big Bay Point Road

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (m)	33.0	37.8	30.5	16.7
Average Queue (m)	16.0	23.8	10.7	5.4
95th Queue (m)	27.8	36.9	22.5	12.4
Link Distance (m)		203.3	203.3	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)	60.0			60.0
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 895

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	334	1698	1630	774	295	317
v/c Ratio	0.69	0.46	0.61	0.53	0.57	0.68
Control Delay	40.2	3.9	6.0	4.5	46.9	41.4
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0
Total Delay	40.2	4.2	6.0	4.5	46.9	41.4
Queue Length 50th (m)	23.0	2.4	18.9	14.9	32.6	30.7
Queue Length 95th (m)	33.1	56.9	24.5	m76.7	43.7	44.8
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	527	3684	2665	1468	825	703
Starvation Cap Reductn	0	1048	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	0.63	0.64	0.61	0.53	0.36	0.45

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)	334	1698	0	0	1630	774	295	0	317	0	0	0
Future Volume (vph)	334	1698	0	0	1630	774	295	0	317	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0			6.0	4.0	6.0		6.0			
Lane Util. Factor	0.97	0.91			0.91	1.00	0.97		0.88			
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)	3213	5036			4893	1468	3242		2561			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3213	5036			4893	1468	3242		2561			
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	1698	0	0	1630	774	295	0	317	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	58	0	0	0
Lane Group Flow (vph)	334	1698	0	0	1630	774	295	0	259	0	0	0
Heavy Vehicles (%)	9%	3%	0%	0%	6%	10%	8%	0%	11%	0%	0%	0%
Turn Type	Prot	NA			NA	Free	Prot		Perm			
Protected Phases	5	2			6		8					
Permitted Phases						Free			8			
Actuated Green, G (s)	16.6	80.5			59.9	110.0	17.5		17.5			
Effective Green, g (s)	16.6	80.5			59.9	110.0	17.5		17.5			
Actuated g/C Ratio	0.15	0.73			0.54	1.00	0.16		0.16			
Clearance Time (s)	4.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)	484	3685			2664	1468	515		407			
v/s Ratio Prot	c0.10	0.34			c0.33		0.09					
v/s Ratio Perm						c0.53			0.10			
v/c Ratio	0.69	0.46			0.61	0.53	0.57		0.64			
Uniform Delay, d1	44.3	6.0			17.1	0.0	42.8		43.3			
Progression Factor	0.79	0.58			0.29	1.00	1.00		1.00			
Incremental Delay, d2	3.0	0.3			0.7	0.9	1.5		3.2			
Delay (s)	37.8	3.7			5.7	0.9	44.3		46.5			
Level of Service	D	A			A	A	D		D			
Approach Delay (s)		9.4			4.1			45.5			0.0	
Approach LOS		A			A			D			A	

Intersection Summary

HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.1%	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)	307	1565	29	8	1977	85	223	30	39	10	205
v/c Ratio	0.51	0.47	0.03	0.03	0.85	0.11	0.56	0.14	0.29	0.07	0.36
Control Delay	61.9	4.3	0.0	5.9	17.9	0.3	51.3	25.6	53.2	47.4	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.9	4.3	0.0	5.9	18.8	0.3	51.3	25.6	53.2	47.4	5.7
Queue Length 50th (m)	36.2	10.9	0.0	0.4	48.7	0.1	25.0	2.5	8.5	2.2	0.0
Queue Length 95th (m)	52.9	41.0	m0.0	m0.5	#213.0	m0.2	36.5	11.3	19.2	7.6	16.4
Internal Link Dist (m)		225.6			141.6			127.2		94.6	
Turn Bay Length (m)	160.0		175.0	50.0			50.0		60.0		
Base Capacity (vph)	605	3296	1036	265	2315	772	1103	558	135	142	570
Starvation Cap Reductn	0	0	0	0	127	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	0.51	0.47	0.03	0.03	0.90	0.11	0.20	0.05	0.29	0.07	0.36

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)	307	1565	29	8	1977	85	223	12	18	39	10	205
Future Volume (vph)	307	1565	29	8	1977	85	223	12	18	39	10	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.91		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)	3367	4893	1476	1805	4848	1475	3467	1716		1805	1900	1599
Flt Permitted	0.95	1.00	1.00	0.15	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3367	4893	1476	287	4848	1475	3467	1716		1805	1900	1599
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)	307	1565	29	8	1977	85	223	12	18	39	10	205
RTOR Reduction (vph)	0	0	11	0	0	46	0	16	0	0	0	158
Lane Group Flow (vph)	307	1565	18	8	1977	39	223	14	0	39	10	47
Confl. Peds. (#/hr)	2		1	1		2			1	1		
Heavy Vehicles (%)	4%	6%	8%	0%	7%	8%	1%	0%	0%	0%	0%	1%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases			2	6		6						4
Actuated Green, G (s)	19.8	68.6	68.6	51.6	50.2	50.2	12.6	12.6		5.4	5.4	25.2
Effective Green, g (s)	19.8	68.6	68.6	51.6	50.2	50.2	12.6	12.6		5.4	5.4	25.2
Actuated g/C Ratio	0.18	0.62	0.62	0.47	0.46	0.46	0.11	0.11		0.05	0.05	0.23
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0
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)	606	3051	920	153	2212	673	397	196		88	93	366
v/s Ratio Prot	c0.09	0.32		0.00	c0.41		c0.06	0.01		c0.02	0.01	0.02
v/s Ratio Perm			0.01	0.02		0.03						0.01
v/c Ratio	0.51	0.51	0.02	0.05	0.89	0.06	0.56	0.07		0.44	0.11	0.13
Uniform Delay, d1	40.7	11.5	7.9	15.6	27.5	16.7	46.1	43.5		50.8	50.0	33.7
Progression Factor	1.43	0.35	1.00	0.66	0.52	0.08	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	0.6	0.0	0.1	3.6	0.1	1.8	0.2		3.5	0.5	0.2
Delay (s)	58.7	4.6	7.9	10.4	17.8	1.5	47.9	43.6		54.4	50.5	33.8
Level of Service	E	A	A	B	B	A	D	D		D	D	C
Approach Delay (s)		13.4			17.1			47.4			37.6	
Approach LOS		B			B			D			D	

Intersection Summary

HCM 2000 Control Delay	18.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (m)	52.0	85.1	99.7	49.0	53.7	196.5	160.2	91.4	49.5	58.4	58.1	58.7
Average Queue (m)	27.6	27.6	10.8	6.1	7.8	98.3	38.5	29.8	9.3	30.1	27.0	29.5
95th Queue (m)	46.9	59.7	51.1	27.4	32.9	195.2	111.2	59.1	32.9	51.2	48.3	52.1
Link Distance (m)		168.4	168.4	168.4	168.4	218.3	218.3	218.3			335.8	335.8
Upstream Blk Time (%)		0				0						
Queuing Penalty (veh)		0				2						
Storage Bay Dist (m)	130.0								130.0	265.0		
Storage Blk Time (%)								0				
Queuing Penalty (veh)								0				

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	NB
Directions Served	R
Maximum Queue (m)	45.8
Average Queue (m)	14.7
95th Queue (m)	35.9
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	265.0
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	L
Maximum Queue (m)	51.0	58.1	56.2	46.4	69.3	10.2	46.7	138.5	142.8	143.7	162.8	49.6
Average Queue (m)	30.2	36.5	24.9	21.9	38.4	1.9	4.4	89.7	94.3	114.3	61.1	15.8
95th Queue (m)	46.6	51.4	45.5	38.5	61.9	7.8	24.2	146.9	155.1	158.1	175.3	34.4
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)								1	2	8	4	
Queuing Penalty (veh)								6	8	39	18	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)								27				0
Queuing Penalty (veh)								2				0

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R
Maximum Queue (m)	63.9	17.0	28.5	12.9	50.2
Average Queue (m)	28.2	4.5	9.3	2.4	25.6
95th Queue (m)	50.4	12.1	21.9	8.5	45.5
Link Distance (m)	128.7	128.7		96.0	96.0
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)			60.0		
Storage Blk Time (%)	1				
Queuing Penalty (veh)	2				

Zone Summary

Zone wide Queuing Penalty: 77

Queues

210498

3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

2026 Future Total - PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	27	1321	421	1720	36	47	550	364	55
v/c Ratio	0.19	0.58	0.82	0.71	0.09	0.11	0.93	0.69	0.05
Control Delay	19.1	30.8	68.9	16.4	23.0	37.6	43.3	37.2	21.0
Queue Delay	0.0	0.8	0.0	0.2	0.0	0.0	1.1	0.0	0.0
Total Delay	19.1	31.6	68.9	16.6	23.0	37.6	44.4	37.2	21.0
Queue Length 50th (m)	2.8	90.6	44.1	142.0	5.9	10.1	67.4	73.4	3.8
Queue Length 95th (m)	m7.2	111.2	68.8	38.7	11.9	19.3	#114.7	93.8	8.3
Internal Link Dist (m)		85.2		118.2		85.0			175.8
Turn Bay Length (m)	70.0		65.0		20.0			40.0	
Base Capacity (vph)	144	2277	544	2433	393	540	677	531	1268
Starvation Cap Reductn	0	0	0	135	0	0	0	0	0
Spillback Cap Reductn	0	583	0	0	0	0	29	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.78	0.77	0.75	0.09	0.09	0.85	0.69	0.04

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis

210498

3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

2026 Future Total - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	1296	25	421	1342	378	36	47	550	364	39	16
Future Volume (vph)	27	1296	25	421	1342	378	36	47	550	364	39	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0	6.0	4.0	6.0	
Lane Util. Factor	1.00	0.86		0.97	0.91		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.99	1.00	
Frt	1.00	1.00		1.00	0.97		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	6327		3502	4878		1805	1900	1575	1775	3452	
Flt Permitted	0.09	1.00		0.95	1.00		0.72	1.00	1.00	0.64	1.00	
Satd. Flow (perm)	169	6327		3502	4878		1367	1900	1575	1196	3452	
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)	27	1296	25	421	1342	378	36	47	550	364	39	16
RTOR Reduction (vph)	0	2	0	0	35	0	0	0	247	0	11	0
Lane Group Flow (vph)	27	1319	0	421	1685	0	36	47	303	364	44	0
Confl. Peds. (#/hr)	7		1	1		7			6	6		
Heavy Vehicles (%)	0%	3%	2%	0%	2%	3%	0%	0%	0%	1%	0%	0%
Turn Type	pm+pt	NA		Prot	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2						8		8	4		
Actuated Green, G (s)	48.7	45.1		19.2	60.7		33.1	29.7	29.7	49.7	42.3	
Effective Green, g (s)	48.7	45.1		19.2	60.7		33.1	29.7	29.7	49.7	42.3	
Actuated g/C Ratio	0.37	0.35		0.15	0.47		0.25	0.23	0.23	0.38	0.33	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0	6.0	4.0	6.0	
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)	108	2194		517	2277		359	434	359	528	1123	
v/s Ratio Prot	0.01	0.21		c0.12	c0.35		0.00	0.02		c0.08	0.01	
v/s Ratio Perm	0.09						0.02		c0.19	0.18		
v/c Ratio	0.25	0.60		0.81	0.74		0.10	0.11	0.84	0.69	0.04	
Uniform Delay, d1	26.9	35.0		53.7	28.2		36.8	39.7	47.9	32.2	30.0	
Progression Factor	0.90	0.84		1.07	0.54		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.1	1.2		8.4	1.9		0.1	0.1	16.4	3.7	0.0	
Delay (s)	25.4	30.6		65.6	17.1		37.0	39.8	64.3	35.9	30.0	
Level of Service	C	C		E	B		D	D	E	D	C	
Approach Delay (s)		30.5			26.7			61.0			35.2	
Approach LOS		C			C			E			D	

Intersection Summary

HCM 2000 Control Delay	33.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	87.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Queues
6: Mapleview Drive W & Highway 400 SB Off-Ramp

210498
2026 Future Total - PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	1937	271	467	1772	784	368
v/c Ratio	0.83	0.42	0.94	0.53	0.90	0.49
Control Delay	30.6	8.9	44.7	9.5	60.7	36.2
Queue Delay	0.3	0.3	0.0	0.5	1.9	0.0
Total Delay	30.9	9.2	44.7	10.0	62.6	36.2
Queue Length 50th (m)	153.2	10.3	102.9	120.0	104.2	39.6
Queue Length 95th (m)	147.9	m19.5	#169.2	142.4	#135.6	57.0
Internal Link Dist (m)	118.2			168.8		
Turn Bay Length (m)		45.0	135.0		300.0	300.0
Base Capacity (vph)	2339	651	535	3332	906	778
Starvation Cap Reductn	86	82	0	967	0	0
Spillback Cap Reductn	0	0	0	293	44	2
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.48	0.87	0.75	0.91	0.47

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
6: Mapleview Drive W & Highway 400 SB Off-Ramp

210498
2026 Future Total - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1937	271	467	1772	0	0	0	0	784	0	368
Future Volume (vph)	0	1937	271	467	1772	0	0	0	0	784	0	368
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	4.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	1.00	0.91					0.97		0.88
Frpb, ped/bikes		1.00	1.00	1.00	1.00					1.00		1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		6408	1553	1736	5136					3367		2733
Flt Permitted		1.00	1.00	0.08	1.00					0.95		1.00
Satd. Flow (perm)		6408	1553	142	5136					3367		2733
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	1937	271	467	1772	0	0	0	0	784	0	368
RTOR Reduction (vph)	0	0	84	0	0	0	0	0	0	0	0	44
Lane Group Flow (vph)	0	1937	187	467	1772	0	0	0	0	784	0	324
Confl. Peds. (#/hr)	4					4						
Heavy Vehicles (%)	0%	2%	4%	4%	1%	0%	0%	0%	0%	4%	0%	4%
Turn Type		NA	Perm	pm+pt	NA					Prot		Perm
Protected Phases		2		1	6					4		
Permitted Phases			2	6								4
Actuated Green, G (s)		47.4	47.4	84.3	84.3					33.7		33.7
Effective Green, g (s)		47.4	47.4	84.3	84.3					33.7		33.7
Actuated g/C Ratio		0.36	0.36	0.65	0.65					0.26		0.26
Clearance Time (s)		6.0	6.0	4.0	6.0					6.0		6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		3.0
Lane Grp Cap (vph)		2336	566	495	3330					872		708
v/s Ratio Prot		0.30		c0.24	0.35					c0.23		
v/s Ratio Perm			0.12	c0.37								0.12
v/c Ratio		0.83	0.33	0.94	0.53					0.90		0.46
Uniform Delay, d1		37.6	29.8	39.2	12.3					46.5		40.5
Progression Factor		0.72	0.45	0.63	0.73					1.00		1.00
Incremental Delay, d2		2.7	1.2	20.3	0.4					12.0		0.5
Delay (s)		29.6	14.5	44.9	9.4					58.5		40.9
Level of Service		C	B	D	A					E		D
Approach Delay (s)		27.8			16.8			0.0			52.9	
Approach LOS		C			B			A			D	

Intersection Summary

HCM 2000 Control Delay	28.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	120.3%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	735	1986	1709	1145	529	553
v/c Ratio	1.01	0.56	0.73	1.11	0.75	0.91
Control Delay	64.6	13.6	23.8	68.5	55.5	64.4
Queue Delay	0.0	2.0	0.0	0.3	0.0	0.0
Total Delay	64.6	15.7	23.8	68.8	55.5	64.4
Queue Length 50th (m)	~113.9	149.6	77.5	~133.4	68.7	74.5
Queue Length 95th (m)	m#146.8	165.0	m75.7	m#122.4	89.0	#108.3
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	728	3531	2331	1031	739	634
Starvation Cap Reductn	0	1338	0	59	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.01	0.91	0.73	1.18	0.72	0.87

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)	735	1986	0	0	1709	1145	529	0	553	0	0	0
Future Volume (vph)	735	1986	0	0	1709	1145	529	0	553	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0			6.0	6.0	6.0		6.0			
Lane Util. Factor	0.97	0.91			0.91	1.00	0.97		0.88			
Frpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00			
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)	3433	5036			5085	1583	3433		2733			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3433	5036			5085	1583	3433		2733			
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)	735	1986	0	0	1709	1145	529	0	553	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	306	0	0	47	0	0	0
Lane Group Flow (vph)	735	1986	0	0	1709	839	529	0	506	0	0	0
Confl. Peds. (#/hr)			3	3								
Heavy Vehicles (%)	2%	3%	0%	0%	2%	2%	2%	0%	4%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Prot		Perm			
Protected Phases	5	2			6		8					
Permitted Phases						6			8			
Actuated Green, G (s)	27.6	91.2			59.6	59.6	26.8		26.8			
Effective Green, g (s)	27.6	91.2			59.6	59.6	26.8		26.8			
Actuated g/C Ratio	0.21	0.70			0.46	0.46	0.21		0.21			
Clearance Time (s)	4.0	6.0			6.0	6.0	6.0		6.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0			
Lane Grp Cap (vph)	728	3532			2331	725	707		563			
v/s Ratio Prot	c0.21	0.39			0.34		0.15					
v/s Ratio Perm						c0.53			c0.19			
v/c Ratio	1.01	0.56			0.73	1.16	0.75		0.90			
Uniform Delay, d1	51.2	9.6			28.7	35.2	48.4		50.3			
Progression Factor	0.72	1.35			0.82	0.90	1.00		1.00			
Incremental Delay, d2	26.3	0.3			0.2	72.4	4.3		17.1			
Delay (s)	63.1	13.3			23.6	104.2	52.8		67.3			
Level of Service	E	B			C	F	D		E			
Approach Delay (s)		26.7			55.9			60.2			0.0	
Approach LOS		C			E			E			A	

Intersection Summary

HCM 2000 Control Delay	44.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	120.3%	ICU Level of Service	H
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)	438	1815	64	60	1522	266	827	80	234	50	505
v/c Ratio	1.25	1.04	0.10	0.37	1.03	0.45	0.92	0.17	0.73	0.15	1.25
Control Delay	183.0	55.1	0.4	25.9	65.2	7.6	62.2	33.4	65.2	47.4	162.5
Queue Delay	0.0	0.0	0.0	0.0	4.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	183.0	55.1	0.4	25.9	69.3	7.6	62.2	33.4	65.2	47.4	162.5
Queue Length 50th (m)	~74.3	~203.5	0.1	6.4	~163.0	4.6	110.6	14.6	60.9	11.7	~139.8
Queue Length 95th (m)	m#106.1	#231.5	m0.5	m9.6	#187.7	m15.0	#144.7	28.2	#98.8	24.0	#210.9
Internal Link Dist (m)		225.6			141.6			127.2		94.6	
Turn Bay Length (m)	160.0		175.0	50.0			50.0		60.0		
Base Capacity (vph)	350	1743	627	164	1472	592	933	494	321	338	405
Starvation Cap Reductn	0	0	0	0	16	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	1.25	1.04	0.10	0.37	1.05	0.45	0.89	0.16	0.73	0.15	1.25

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	438	1815	64	60	1522	266	827	65	15	234	50	505
Future Volume (vph)	438	1815	64	60	1522	266	827	65	15	234	50	505
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		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)	3502	4940	1578	1787	5036	1529	3467	1812		1805	1900	1615
Flt Permitted	0.95	1.00	1.00	0.11	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	4940	1578	198	5036	1529	3467	1812		1805	1900	1615
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)	438	1815	64	60	1522	266	827	65	15	234	50	505
RTOR Reduction (vph)	0	0	42	0	0	145	0	7	0	0	0	118
Lane Group Flow (vph)	438	1815	22	60	1522	121	827	73	0	234	50	387
Confl. Peds. (#/hr)	3		1	1		3			2	2		
Heavy Vehicles (%)	0%	5%	1%	1%	3%	4%	1%	2%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2	6		6						4
Actuated Green, G (s)	13.0	45.1	45.1	43.9	38.0	38.0	33.9	33.9		23.1	23.1	23.1
Effective Green, g (s)	13.0	45.1	45.1	43.9	38.0	38.0	33.9	33.9		23.1	23.1	23.1
Actuated g/C Ratio	0.10	0.35	0.35	0.34	0.29	0.29	0.26	0.26		0.18	0.18	0.18
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	350	1713	547	138	1472	446	904	472		320	337	286
v/s Ratio Prot	c0.13	c0.37		0.02	0.30		c0.24	0.04		0.13	0.03	
v/s Ratio Perm			0.01	0.13		0.08						c0.24
v/c Ratio	1.25	1.06	0.04	0.43	1.03	0.27	0.91	0.16		0.73	0.15	1.35
Uniform Delay, d1	58.5	42.5	28.1	34.1	46.0	35.4	46.6	37.0		50.5	45.1	53.5
Progression Factor	1.16	0.53	0.23	0.98	0.80	0.63	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	130.4	37.2	0.1	1.4	28.4	1.0	13.5	0.2		8.3	0.2	180.8
Delay (s)	198.1	59.5	6.7	34.9	65.4	23.2	60.2	37.2		58.8	45.3	234.2
Level of Service	F	E	A	C	E	C	E	D		E	D	F
Approach Delay (s)		84.3			58.3			58.1			170.2	
Approach LOS		F			E			E			F	

Intersection Summary

HCM 2000 Control Delay	83.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	99.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	483	1359	222	73	1249	276	239	296	181	516
v/c Ratio	0.84	0.54	0.30	0.33	0.70	0.77	0.41	0.71	0.25	0.92
Control Delay	72.0	20.2	7.7	20.1	38.9	71.2	40.9	41.9	42.3	41.0
Queue Delay	0.0	0.1	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.7
Total Delay	72.0	20.4	7.7	20.1	39.9	71.2	40.9	41.9	42.3	41.7
Queue Length 50th (m)	68.1	59.7	12.6	8.6	108.1	37.7	25.0	60.0	21.2	58.3
Queue Length 95th (m)	m68.8	m59.0	m13.0	17.8	134.8	#54.2	36.4	81.9	30.3	#116.2
Internal Link Dist (m)		141.6			238.0		219.7		226.0	
Turn Bay Length (m)	70.0		50.0	120.0		95.0		110.0		45.0
Base Capacity (vph)	610	2501	749	233	1778	373	776	416	934	630
Starvation Cap Reductn	0	292	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	267	0	0	0	0	17
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.62	0.30	0.31	0.83	0.74	0.31	0.71	0.19	0.84

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)	483	1359	222	73	1057	192	276	174	65	296	181	516
Future Volume (vph)	483	1359	222	73	1057	192	276	174	65	296	181	516
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3303	5085	1367	1703	4855		3467	3329		1686	3574	1524
Flt Permitted	0.95	1.00	1.00	0.17	1.00		0.95	1.00		0.46	1.00	1.00
Satd. Flow (perm)	3303	5085	1367	312	4855		3467	3329		816	3574	1524
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)	483	1359	222	73	1057	192	276	174	65	296	181	516
RTOR Reduction (vph)	0	0	78	0	18	0	0	32	0	0	0	249
Lane Group Flow (vph)	483	1359	144	73	1231	0	276	207	0	296	181	267
Confl. Peds. (#/hr)	1		4	4		1			1	1		
Heavy Vehicles (%)	6%	2%	16%	6%	2%	16%	1%	5%	0%	7%	1%	6%
Turn Type	Prot	NA	Perm	pm+pt	NA		Prot	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)	22.5	63.2	63.2	53.7	47.2		13.5	21.8		44.3	26.8	26.8
Effective Green, g (s)	22.5	63.2	63.2	53.7	47.2		13.5	21.8		44.3	26.8	26.8
Actuated g/C Ratio	0.17	0.49	0.49	0.41	0.36		0.10	0.17		0.34	0.21	0.21
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
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)	571	2472	664	198	1762		360	558		401	736	314
v/s Ratio Prot	c0.15	0.27		0.02	c0.25		0.08	0.06		c0.10	0.05	
v/s Ratio Perm			0.11	0.13						0.15		c0.18
v/c Ratio	0.85	0.55	0.22	0.37	0.70		0.77	0.37		0.74	0.25	0.85
Uniform Delay, d1	52.1	23.4	19.2	23.5	35.3		56.7	48.0		34.5	43.2	49.7
Progression Factor	1.32	0.80	0.89	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.8	0.2	0.2	1.2	2.3		9.4	0.4		7.0	0.2	18.8
Delay (s)	71.4	18.9	17.3	24.6	37.7		66.1	48.4		41.4	43.3	68.5
Level of Service	E	B	B	C	D		E	D		D	D	E
Approach Delay (s)		31.0			36.9			57.9			55.8	
Approach LOS		C			D			E			E	

Intersection Summary

HCM 2000 Control Delay	40.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	289	24	15	108	741	11	991
v/c Ratio	0.63	0.15	0.05	0.28	0.31	0.02	0.50
Control Delay	29.1	33.8	16.1	7.0	8.1	6.0	13.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.1	33.8	16.1	7.0	8.1	6.0	13.8
Queue Length 50th (m)	14.7	4.0	0.2	4.1	19.6	0.4	48.2
Queue Length 95th (m)	31.5	11.0	5.6	15.0	64.1	2.8	95.4
Internal Link Dist (m)	115.4		50.9		226.0		199.1
Turn Bay Length (m)				70.0		50.0	
Base Capacity (vph)	808	163	442	396	2369	557	1995
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.15	0.03	0.27	0.31	0.02	0.50

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	155	1	133	24	1	14	108	717	24	11	835	156
Future Volume (vph)	155	1	133	24	1	14	108	717	24	11	835	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor		0.95		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.93		1.00	0.86		1.00	1.00		1.00	0.98	
Flt Protected		0.97		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3243		1442	1634		1656	3425		1805	3368	
Flt Permitted		0.81		0.35	1.00		0.22	1.00		0.37	1.00	
Satd. Flow (perm)		2692		528	1634		384	3425		703	3368	
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)	155	1	133	24	1	14	108	717	24	11	835	156
RTOR Reduction (vph)	0	117	0	0	11	0	0	1	0	0	10	0
Lane Group Flow (vph)	0	172	0	24	4	0	108	740	0	11	981	0
Confl. Peds. (#/hr)			6	6			7		2	2		7
Heavy Vehicles (%)	0%	0%	0%	25%	0%	0%	9%	5%	0%	0%	5%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		12.5		19.0	19.0		73.8	68.6		62.9	61.7	
Effective Green, g (s)		12.5		19.0	19.0		73.8	68.6		62.9	61.7	
Actuated g/C Ratio		0.12		0.18	0.18		0.70	0.65		0.60	0.59	
Clearance Time (s)		6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		321		117	296		368	2241		434	1982	
v/s Ratio Prot				c0.00	0.00		c0.02	0.22		0.00	c0.29	
v/s Ratio Perm		c0.06		0.03			0.18			0.01		
v/c Ratio		0.54		0.21	0.01		0.29	0.33		0.03	0.49	
Uniform Delay, d1		43.4		35.9	35.2		6.4	8.0		8.4	12.5	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.7		0.9	0.0		0.4	0.4		0.0	0.9	
Delay (s)		45.1		36.8	35.2		6.8	8.4		8.5	13.4	
Level of Service		D		D	D		A	A		A	B	
Approach Delay (s)		45.1			36.2			8.2			13.3	
Approach LOS		D			D			A			B	

Intersection Summary

HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	104.8	Sum of lost time (s)	20.0
Intersection Capacity Utilization	80.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	160	1	96	1	1	93	793	1069
v/c Ratio	0.61	0.00	0.42	0.01	0.00	0.23	0.31	0.48
Control Delay	48.2	40.0	14.3	35.0	0.0	5.0	5.1	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.2	40.0	14.3	35.0	0.0	5.0	5.1	10.7
Queue Length 50th (m)	29.4	0.2	0.0	0.2	0.0	3.1	19.2	47.6
Queue Length 95th (m)	50.1	1.8	14.6	1.6	0.0	11.8	47.6	97.1
Internal Link Dist (m)		62.1			66.5		199.1	252.7
Turn Bay Length (m)	25.0					70.0		
Base Capacity (vph)	261	465	377	195	556	426	2563	2229
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	0.61	0.00	0.25	0.01	0.00	0.22	0.31	0.48

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	1	96	1	0	1	93	792	1	0	905	164
Future Volume (vph)	160	1	96	1	0	1	93	792	1	0	905	164
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0			6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95			0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	0.85		1.00	1.00			0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1770	1900	1233	1805	1615		1805	3471			3456	
Flt Permitted	0.70	1.00	1.00	1.00	1.00		0.20	1.00			1.00	
Satd. Flow (perm)	1307	1900	1233	1900	1615		383	3471			3456	
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)	160	1	96	1	0	1	93	792	1	0	905	164
RTOR Reduction (vph)	0	0	84	0	1	0	0	0	0	0	10	0
Lane Group Flow (vph)	160	1	12	1	0	0	93	793	0	0	1059	0
Confl. Peds. (#/hr)							2		2	2		2
Heavy Vehicles (%)	2%	0%	31%	0%	0%	0%	0%	4%	0%	0%	2%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	17.6	12.4	12.4	2.9	1.7		70.8	70.8			60.8	
Effective Green, g (s)	17.6	12.4	12.4	2.9	1.7		70.8	70.8			60.8	
Actuated g/C Ratio	0.18	0.12	0.12	0.03	0.02		0.71	0.71			0.61	
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	283	234	152	53	27		355	2447			2092	
v/s Ratio Prot	c0.07	0.00		0.00	0.00		0.02	c0.23			c0.31	
v/s Ratio Perm	c0.03		0.01	0.00			0.17					
v/c Ratio	0.57	0.00	0.08	0.02	0.00		0.26	0.32			0.51	
Uniform Delay, d1	37.6	38.6	38.9	47.4	48.5		6.2	5.7			11.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	2.6	0.0	0.2	0.1	0.0		0.4	0.4			0.9	
Delay (s)	40.1	38.6	39.2	47.5	48.5		6.6	6.0			12.1	
Level of Service	D	D	D	D	D		A	A			B	
Approach Delay (s)		39.8			48.0			6.1			12.1	
Approach LOS		D			D			A			B	

Intersection Summary

HCM 2000 Control Delay	12.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	100.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	76.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	102	23	60	55	39	64	864	70	1071
v/c Ratio	0.26	0.07	0.17	0.15	0.13	0.20	0.48	0.22	0.59
Control Delay	34.0	42.1	2.9	32.5	19.3	9.6	19.6	9.9	21.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.0	42.1	2.9	32.5	19.3	9.6	19.6	9.9	21.5
Queue Length 50th (m)	19.0	4.8	0.0	10.0	1.7	5.5	69.3	6.1	92.5
Queue Length 95th (m)	33.8	12.6	3.6	20.7	11.9	10.8	86.7	11.9	113.8
Internal Link Dist (m)		132.6			203.0		252.7		204.9
Turn Bay Length (m)	50.0		50.0	30.0		70.0		65.0	
Base Capacity (vph)	389	332	361	360	300	316	1790	318	1808
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	0.26	0.07	0.17	0.15	0.13	0.20	0.48	0.22	0.59

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	23	60	55	8	31	64	811	53	70	954	117
Future Volume (vph)	102	23	60	55	8	31	64	811	53	70	954	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.88		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1900	1593	1717	1647		1805	3457		1455	3483	
Flt Permitted	0.70	1.00	1.00	0.74	1.00		0.18	1.00		0.26	1.00	
Satd. Flow (perm)	1324	1900	1593	1342	1647		340	3457		392	3483	
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)	102	23	60	55	8	31	64	811	53	70	954	117
RTOR Reduction (vph)	0	0	50	0	26	0	0	4	0	0	8	0
Lane Group Flow (vph)	102	23	11	55	13	0	64	860	0	70	1063	0
Confl. Peds. (#/hr)			1	1			3		3	3		3
Heavy Vehicles (%)	0%	0%	0%	5%	0%	2%	0%	3%	8%	24%	2%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	30.0	21.0	21.0	28.0	20.0		71.0	62.0		71.0	62.0	
Effective Green, g (s)	30.0	21.0	21.0	28.0	20.0		71.0	62.0		71.0	62.0	
Actuated g/C Ratio	0.25	0.18	0.18	0.23	0.17		0.59	0.52		0.59	0.52	
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Grp Cap (vph)	367	332	278	338	274		311	1786		311	1799	
v/s Ratio Prot	c0.02	0.01		0.01	0.01		0.02	0.25		c0.02	c0.31	
v/s Ratio Perm	c0.05		0.01	0.03			0.11			0.12		
v/c Ratio	0.28	0.07	0.04	0.16	0.05		0.21	0.48		0.23	0.59	
Uniform Delay, d1	35.8	41.3	41.1	36.4	42.0		12.4	18.7		11.4	20.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	0.4	0.3	1.0	0.3		1.5	0.9		1.7	1.4	
Delay (s)	37.7	41.7	41.4	37.5	42.3		13.9	19.6		13.1	21.6	
Level of Service	D	D	D	D	D		B	B		B	C	
Approach Delay (s)		39.4			39.5			19.2			21.1	
Approach LOS		D			D			B			C	

Intersection Summary

HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	0	9	69	0	25	7	937	16	7	927	6
Future Volume (Veh/h)	25	0	9	69	0	25	7	937	16	7	927	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	25	0	9	69	0	25	7	937	16	7	927	6
Pedestrians					3						1	
Lane Width (m)					3.6						3.6	
Walking Speed (m/s)					1.2						1.2	
Percent Blockage					0						0	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								229				
pX, platoon unblocked	0.85	0.85		0.85	0.85	0.85				0.85		
vC, conflicting volume	1452	1914	466	1448	1909	480	933			956		
vC1, stage 1 conf vol	944	944		962	962							
vC2, stage 2 conf vol	508	970		486	947							
vCu, unblocked vol	1180	1723	466	1176	1717	37	933			597		
tC, single (s)	7.5	6.5	6.9	7.6	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.6	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	91	100	98	78	100	97	99			99		
cM capacity (veh/h)	265	260	543	314	259	876	729			840		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	34	94	7	625	328	7	618	315
Volume Left	25	69	7	0	0	7	0	0
Volume Right	9	25	0	0	16	0	0	6
cSH	307	379	729	1700	1700	840	1700	1700
Volume to Capacity	0.11	0.25	0.01	0.37	0.19	0.01	0.36	0.19
Queue Length 95th (m)	3.0	7.7	0.2	0.0	0.0	0.2	0.0	0.0
Control Delay (s)	18.2	17.6	10.0	0.0	0.0	9.3	0.0	0.0
Lane LOS	C	C	A			A		
Approach Delay (s)	18.2	17.6	0.1			0.1		
Approach LOS	C	C						

Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	39.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	110	110	41	944	830	29
Future Volume (Veh/h)	110	110	41	944	830	29
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	110	110	41	944	830	29
Pedestrians	1					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)					276	
pX, platoon unblocked	0.94	0.94	0.94			
vC, conflicting volume	1400	430	860			
vC1, stage 1 conf vol	846					
vC2, stage 2 conf vol	554					
vCu, unblocked vol	1295	263	721			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	68	84	95			
cM capacity (veh/h)	348	696	835			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	110	110	41	472	472	553	306
Volume Left	110	0	41	0	0	0	0
Volume Right	0	110	0	0	0	0	29
cSH	348	696	835	1700	1700	1700	1700
Volume to Capacity	0.32	0.16	0.05	0.28	0.28	0.33	0.18
Queue Length 95th (m)	10.6	4.5	1.2	0.0	0.0	0.0	0.0
Control Delay (s)	20.0	11.1	9.5	0.0	0.0	0.0	0.0
Lane LOS	C	B	A				
Approach Delay (s)	15.6		0.4			0.0	
Approach LOS	C						

Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	43.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	35	27	10	1017	802	16
Future Volume (Veh/h)	35	27	10	1017	802	16
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	35	27	10	1017	802	16
Pedestrians	2					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)					122	
pX, platoon unblocked	0.92	0.92	0.92			
vC, conflicting volume	1340	411	820			
vC1, stage 1 conf vol	812					
vC2, stage 2 conf vol	528					
vCu, unblocked vol	1201	194	637			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	96	99			
cM capacity (veh/h)	378	756	881			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	62	10	508	508	535	283
Volume Left	35	10	0	0	0	0
Volume Right	27	0	0	0	0	16
cSH	483	881	1700	1700	1700	1700
Volume to Capacity	0.13	0.01	0.30	0.30	0.31	0.17
Queue Length 95th (m)	3.5	0.3	0.0	0.0	0.0	0.0
Control Delay (s)	13.5	9.1	0.0	0.0	0.0	0.0
Lane LOS	B	A				
Approach Delay (s)	13.5	0.1			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	38.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	177	723	220	249	483	140	437	614	92	342	327
v/c Ratio	0.61	0.71	0.42	0.80	0.46	0.25	0.80	0.48	0.31	0.42	0.57
Control Delay	30.9	42.5	15.8	40.9	36.1	6.9	34.7	27.6	22.6	41.5	8.5
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	30.9	42.5	15.8	40.9	36.1	6.9	34.7	27.6	22.6	41.5	8.5
Queue Length 50th (m)	27.0	84.3	15.6	38.0	51.6	0.7	74.0	55.2	12.3	39.0	0.0
Queue Length 95th (m)	44.5	107.1	38.7	#69.3	68.3	16.0	#106.9	72.7	22.3	54.1	26.2
Internal Link Dist (m)		841.8			279.6			97.5		104.6	
Turn Bay Length (m)	25.0		25.0	40.0		25.0	100.0		40.0		50.0
Base Capacity (vph)	299	1016	528	320	1058	564	561	1286	298	821	575
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	0.59	0.71	0.42	0.78	0.46	0.25	0.78	0.48	0.31	0.42	0.57

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	723	220	249	483	140	437	438	176	92	342	327
Future Volume (vph)	177	723	220	249	483	140	437	438	176	92	342	327
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
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)	1253	3471	1476	1770	3574	1583	1735	3397		1770	3539	1396
Flt Permitted	0.38	1.00	1.00	0.20	1.00	1.00	0.41	1.00		0.42	1.00	1.00
Satd. Flow (perm)	495	3471	1476	364	3574	1583	740	3397		781	3539	1396
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	723	220	249	483	140	437	438	176	92	342	327
RTOR Reduction (vph)	0	0	96	0	0	96	0	36	0	0	0	251
Lane Group Flow (vph)	177	723	124	249	483	44	437	578	0	92	342	76
Confl. Peds. (#/hr)			1	1			2					2
Heavy Vehicles (%)	44%	4%	8%	2%	1%	2%	4%	2%	1%	2%	2%	14%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	48.1	35.0	35.0	48.9	35.4	35.4	55.0	44.0		34.8	27.8	27.8
Effective Green, g (s)	48.1	35.0	35.0	48.9	35.4	35.4	55.0	44.0		34.8	27.8	27.8
Actuated g/C Ratio	0.40	0.29	0.29	0.41	0.30	0.30	0.46	0.37		0.29	0.23	0.23
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	6.0
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)	282	1016	432	307	1058	468	533	1250		285	823	324
v/s Ratio Prot	0.07	0.21		c0.09	0.14		c0.16	0.17		0.02	0.10	
v/s Ratio Perm	0.18		0.08	c0.24		0.03	c0.22			0.07		0.05
v/c Ratio	0.63	0.71	0.29	0.81	0.46	0.09	0.82	0.46		0.32	0.42	0.23
Uniform Delay, d1	25.2	37.7	32.6	26.2	34.2	30.4	23.8	28.7		31.7	38.9	37.2
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	4.3	2.4	0.4	14.9	0.3	0.1	9.6	1.2		0.7	1.5	1.7
Delay (s)	29.5	40.1	33.0	41.1	34.5	30.5	33.3	30.0		32.3	40.5	38.9
Level of Service	C	D	C	D	C	C	C	C		C	D	D
Approach Delay (s)		37.0			35.8			31.4			38.8	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	35.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	119.5	Sum of lost time (s)	20.0
Intersection Capacity Utilization	103.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	87	1080	161	1232	124	409	105	112
v/c Ratio	0.26	0.35	0.41	0.38	0.51	0.71	0.60	0.33
Control Delay	6.9	11.9	8.8	1.2	53.3	20.1	59.2	30.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.9	11.9	8.8	1.2	53.3	20.1	59.2	30.4
Queue Length 50th (m)	5.3	44.2	1.7	3.4	29.6	11.3	24.8	7.3
Queue Length 95th (m)	11.6	63.9	m13.8	4.9	46.8	27.7	40.8	16.6
Internal Link Dist (m)		279.3		65.0		101.6		166.7
Turn Bay Length (m)	60.0		50.0		45.0		50.0	
Base Capacity (vph)	389	3099	548	3258	243	905	177	718
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	0.22	0.35	0.29	0.38	0.51	0.45	0.59	0.16

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)	87	918	162	161	1187	45	124	83	326	105	54	58
Future Volume (vph)	87	918	162	161	1187	45	124	83	326	105	54	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.88		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	4928		1769	5098		1790	3120		1787	3238	
Flt Permitted	0.19	1.00		0.22	1.00		0.68	1.00		0.35	1.00	
Satd. Flow (perm)	368	4928		417	5098		1273	3120		654	3238	
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)	87	918	162	161	1187	45	124	83	326	105	54	58
RTOR Reduction (vph)	0	12	0	0	2	0	0	297	0	0	53	0
Lane Group Flow (vph)	87	1068	0	161	1230	0	124	112	0	105	59	0
Confl. Peds. (#/hr)	8		7	7		8	10		1	1		10
Heavy Vehicles (%)	0%	3%	0%	2%	1%	4%	0%	0%	1%	1%	3%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	88.9	81.4		92.1	83.0		19.6	11.6		19.4	11.5	
Effective Green, g (s)	88.9	81.4		92.1	83.0		19.6	11.6		19.4	11.5	
Actuated g/C Ratio	0.68	0.63		0.71	0.64		0.15	0.09		0.15	0.09	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	334	3085		390	3254		223	278		166	286	
v/s Ratio Prot	0.02	0.22		c0.03	0.24		0.03	0.04		c0.04	0.02	
v/s Ratio Perm	0.16			c0.26			0.05			c0.06		
v/c Ratio	0.26	0.35		0.41	0.38		0.56	0.40		0.63	0.21	
Uniform Delay, d1	7.1	11.6		6.6	11.2		50.4	55.9		50.2	55.0	
Progression Factor	1.00	1.00		1.29	0.08		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.3		0.5	0.2		3.0	1.0		7.6	0.4	
Delay (s)	7.6	11.9		9.0	1.2		53.4	56.9		57.9	55.4	
Level of Service	A	B		A	A		D	E		E	E	
Approach Delay (s)		11.6			2.1			56.1			56.6	
Approach LOS		B			A			E			E	

Intersection Summary			
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	68.1%	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)	4	530	3	69	539	35	45	346	74	297	324	87
v/c Ratio	0.02	0.51	0.01	0.39	0.52	0.07	0.07	0.16	0.07	0.48	0.15	0.09
Control Delay	31.0	37.5	0.0	41.7	37.7	10.3	10.1	10.4	2.3	16.3	10.3	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	31.0	37.5	0.0	41.7	37.7	10.3	10.1	10.4	2.3	16.3	10.3	2.2
Queue Length 50th (m)	0.7	57.6	0.0	13.7	58.7	0.0	4.3	18.4	0.0	38.3	17.1	0.0
Queue Length 95th (m)	3.6	75.3	0.0	28.9	76.7	8.0	9.5	25.5	6.0	62.0	23.9	6.4
Internal Link Dist (m)		272.4			841.8			297.2			245.2	
Turn Bay Length (m)	60.0		60.0	60.0		60.0	60.0		60.0	60.0		60.0
Base Capacity (vph)	176	1032	480	179	1032	486	630	2152	991	616	2152	997
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	0.02	0.51	0.01	0.39	0.52	0.07	0.07	0.16	0.07	0.48	0.15	0.09

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	530	3	69	539	35	45	346	74	297	324	87
Future Volume (vph)	4	530	3	69	539	35	45	346	74	297	324	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	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)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.32	1.00	1.00	0.33	1.00	1.00	0.56	1.00	1.00	0.54	1.00	1.00
Satd. Flow (perm)	603	3539	1583	616	3539	1583	1035	3539	1583	1013	3539	1583
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)	4	530	3	69	539	35	45	346	74	297	324	87
RTOR Reduction (vph)	0	0	2	0	0	25	0	0	29	0	0	34
Lane Group Flow (vph)	4	530	1	69	539	10	45	346	45	297	324	53
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	35.0	35.0	35.0	35.0	35.0	35.0	73.0	73.0	73.0	73.0	73.0	73.0
Effective Green, g (s)	35.0	35.0	35.0	35.0	35.0	35.0	73.0	73.0	73.0	73.0	73.0	73.0
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.29	0.29	0.61	0.61	0.61	0.61	0.61	0.61
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Grp Cap (vph)	175	1032	461	179	1032	461	629	2152	962	616	2152	962
v/s Ratio Prot		0.15			c0.15			0.10			0.09	
v/s Ratio Perm	0.01		0.00	0.11		0.01	0.04		0.03	c0.29		0.03
v/c Ratio	0.02	0.51	0.00	0.39	0.52	0.02	0.07	0.16	0.05	0.48	0.15	0.06
Uniform Delay, d1	30.3	35.4	30.1	33.9	35.5	30.3	9.6	10.2	9.5	13.0	10.1	9.5
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	0.2	1.8	0.0	6.2	1.9	0.1	0.2	0.2	0.1	2.7	0.1	0.1
Delay (s)	30.5	37.2	30.1	40.1	37.4	30.4	9.8	10.4	9.6	15.7	10.3	9.6
Level of Service	C	D	C	D	D	C	A	B	A	B	B	A
Approach Delay (s)		37.1			37.3			10.2			12.5	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	B38	B38	B38	WB	WB	WB	WB
Directions Served	L	T	T	T	TR	T	T	T	L	L	T	T
Maximum Queue (m)	53.6	107.2	102.4	85.8	80.6	11.8	5.6	2.0	70.1	78.7	97.1	105.8
Average Queue (m)	9.6	61.6	62.8	49.8	48.1	0.5	0.2	0.1	34.7	41.8	30.8	48.7
95th Queue (m)	35.7	94.1	92.3	79.5	75.2	5.8	2.6	1.4	58.4	64.6	72.2	95.3
Link Distance (m)		86.8	86.8	86.8	86.8	65.4	65.4	65.4			114.0	114.0
Upstream Blk Time (%)		2	1	0	0						0	0
Queuing Penalty (veh)		6	4	0	0						0	0
Storage Bay Dist (m)	70.0								65.0	65.0		
Storage Blk Time (%)	0	5							0	1	0	
Queuing Penalty (veh)	0	1							2	6	2	

Intersection: 3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

Movement	WB	NB	NB	NB	SB	SB	SB
Directions Served	TR	L	T	R	L	T	TR
Maximum Queue (m)	112.2	16.2	26.6	90.7	47.4	179.4	132.8
Average Queue (m)	63.6	4.3	9.1	90.7	45.5	96.0	22.2
95th Queue (m)	107.0	13.2	22.7	91.4	53.1	195.2	86.6
Link Distance (m)	114.0		86.1	86.1		180.4	180.4
Upstream Blk Time (%)	0			88		3	
Queuing Penalty (veh)	2			0		0	
Storage Bay Dist (m)		20.0			40.0		
Storage Blk Time (%)		0	4		58	0	
Queuing Penalty (veh)		0	2		11	0	

Intersection: 6: Mapleview Drive W & Highway 400 SB Off-Ramp

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	T	R	L	T	T	T	L	L	R
Maximum Queue (m)	120.6	124.4	109.2	95.0	75.9	124.6	98.4	70.6	77.2	307.5	358.8	353.7
Average Queue (m)	68.2	66.1	47.3	45.2	13.9	58.4	27.3	27.9	37.4	303.7	342.9	306.4
95th Queue (m)	114.8	111.3	85.9	77.7	39.8	109.1	64.7	57.1	66.0	324.0	379.9	462.2
Link Distance (m)	114.0	114.0	114.0	114.0			168.4	168.4	168.4		326.9	326.9
Upstream Blk Time (%)	1	1	0	0			0	0	0		77	47
Queuing Penalty (veh)	6	8	0	0			2	1	1		0	0
Storage Bay Dist (m)					45.0	135.0				300.0		
Storage Blk Time (%)				7	0	1	0			13	80	51
Queuing Penalty (veh)				20	0	8	1			49	313	94

Intersection: 6: Mapleview Drive W & Highway 400 SB Off-Ramp

Movement	SB	B36	B36
Directions Served	R	T	T
Maximum Queue (m)	307.5	191.9	194.6
Average Queue (m)	227.9	150.2	147.0
95th Queue (m)	427.1	258.5	261.3
Link Distance (m)		176.9	176.9
Upstream Blk Time (%)		66	59
Queuing Penalty (veh)		0	0
Storage Bay Dist (m)	300.0		
Storage Blk Time (%)	0		
Queuing Penalty (veh)	1		

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (m)	137.8	158.0	139.8	108.5	93.2	101.2	77.8	200.6	181.5	85.9	90.0	96.1
Average Queue (m)	86.4	90.4	53.0	39.8	44.6	63.5	37.8	63.4	126.4	56.6	55.6	57.9
95th Queue (m)	143.4	149.2	113.7	84.3	84.9	92.3	59.5	152.2	182.6	80.7	81.9	87.3
Link Distance (m)		168.4	168.4	168.4	168.4	218.3	218.3	218.3			335.8	335.8
Upstream Blk Time (%)		0						0				
Queuing Penalty (veh)		3						1				
Storage Bay Dist (m)	130.0								130.0	265.0		
Storage Blk Time (%)	2	2						0	16			
Queuing Penalty (veh)	7	8						2	92			

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	NB
Directions Served	R
Maximum Queue (m)	80.7
Average Queue (m)	44.2
95th Queue (m)	75.0
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	265.0
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	L
Maximum Queue (m)	151.3	155.9	164.2	145.8	163.4	53.8	57.2	128.3	131.5	144.3	166.6	57.4
Average Queue (m)	83.1	90.7	76.3	72.4	83.1	5.6	14.3	66.2	109.6	132.0	131.6	54.1
95th Queue (m)	136.1	147.9	140.2	131.1	142.2	33.8	41.8	113.8	141.8	149.2	218.4	67.8
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)			0	0	0			0	0	15	23	
Queuing Penalty (veh)			1	0	1			0	1	69	105	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)	1	1	1		1			14				9
Queuing Penalty (veh)	4	6	4		0			9				35

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R
Maximum Queue (m)	138.3	136.7	67.1	100.6	100.6
Average Queue (m)	133.6	76.9	46.4	63.3	100.5
95th Queue (m)	135.5	176.0	73.0	134.1	100.9
Link Distance (m)	128.7	128.7		96.0	96.0
Upstream Blk Time (%)	74	16		15	88
Queuing Penalty (veh)	0	0		0	0
Storage Bay Dist (m)			60.0		
Storage Blk Time (%)	66		14	0	
Queuing Penalty (veh)	274		7	0	

Intersection: 15: Bayview Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	T	R	L	T	T	TR	L	L
Maximum Queue (m)	76.6	84.4	53.8	50.4	53.7	42.1	30.4	247.7	257.5	262.9	78.2	95.4
Average Queue (m)	51.8	55.2	27.7	32.0	34.4	20.3	6.7	98.9	229.9	251.1	33.4	54.2
95th Queue (m)	73.0	77.7	51.3	51.6	52.9	36.6	19.3	252.9	321.3	257.7	75.0	94.4
Link Distance (m)			131.2	131.2	131.2			244.4	244.4	244.4		
Upstream Blk Time (%)								2	49	96		
Queuing Penalty (veh)								0	0	0		
Storage Bay Dist (m)	70.0	70.0				50.0	120.0				95.0	95.0
Storage Blk Time (%)	3	6			1	0		0			0	4
Queuing Penalty (veh)	12	25			2	0		0			0	3

Intersection: 15: Bayview Drive & Mapleview Drive W

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	TR	L	T	T	R
Maximum Queue (m)	65.2	46.8	115.5	175.4	211.8	80.0
Average Queue (m)	26.4	21.1	69.5	42.4	110.3	65.7
95th Queue (m)	53.2	39.7	110.3	131.6	240.2	104.5
Link Distance (m)	218.2	218.2		214.5	214.5	
Upstream Blk Time (%)					6	
Queuing Penalty (veh)					29	
Storage Bay Dist (m)			110.0			45.0
Storage Blk Time (%)	0		2	0	1	48
Queuing Penalty (veh)	0		2	0	3	43

Intersection: 18: Bayview Drive & South Village Way/Barrie Molson Centre D/W

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	60.7	35.1	28.6	12.8	43.8	75.6	73.1	9.8	148.3	157.5
Average Queue (m)	30.6	14.8	7.1	3.0	15.3	25.5	25.7	1.9	59.6	89.8
95th Queue (m)	50.1	28.0	20.3	10.4	33.8	61.1	62.7	7.8	156.8	191.5
Link Distance (m)	126.0	126.0	60.2	60.2		214.5	214.5		195.2	195.2
Upstream Blk Time (%)									2	6
Queuing Penalty (veh)									10	30
Storage Bay Dist (m)					70.0			50.0		
Storage Blk Time (%)						0			4	
Queuing Penalty (veh)						0			0	

Intersection: 21: Bayview Drive & North Village Way/Private D/W

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	L	T	TR	T	TR
Maximum Queue (m)	43.2	39.7	50.8	7.0	6.5	39.0	49.3	54.4	188.2	167.2
Average Queue (m)	25.3	1.9	19.5	0.5	0.5	11.2	17.3	18.5	62.2	80.7
95th Queue (m)	40.0	17.6	44.1	3.6	3.6	25.0	40.8	43.7	178.6	189.3
Link Distance (m)		71.5	71.5	75.9	75.9		195.2	195.2	247.7	247.7
Upstream Blk Time (%)		0	1						1	2
Queuing Penalty (veh)		0	0						6	10
Storage Bay Dist (m)	25.0					70.0				
Storage Blk Time (%)	14								6	
Queuing Penalty (veh)	0								0	

Intersection: 24: Bayview Drive & Concert Way/Churchill Drive

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	39.2	18.5	26.6	33.0	35.5	34.5	85.7	82.7	38.8	91.5	105.8
Average Queue (m)	16.0	4.6	9.2	10.9	7.6	9.5	48.0	47.9	12.8	48.1	63.9
95th Queue (m)	31.1	13.6	19.6	25.2	21.0	26.1	78.7	79.4	34.4	81.4	95.2
Link Distance (m)		140.4			212.1		247.7	247.7		206.4	206.4
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (m)	50.0		50.0	30.0		70.0			65.0		
Storage Blk Time (%)				1	0		1		0	2	
Queuing Penalty (veh)				0	0		1		0	1	

Intersection: 28: Bayview Drive & Industrial Site D/W South/Coca-Cola D/W

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (m)	23.0	55.4	8.2	7.6	4.4	7.9	2.8	2.3
Average Queue (m)	7.9	17.6	1.1	0.3	0.2	0.5	0.1	0.1
95th Queue (m)	17.4	44.1	5.5	3.3	3.7	3.5	1.9	1.2
Link Distance (m)	174.9	182.1		206.4	206.4		206.3	206.3
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)			15.0			15.0		
Storage Blk Time (%)				0			0	
Queuing Penalty (veh)				0			0	

Intersection: 29: Bayview Drive & Medical Centre South D/W

Movement	EB	EB	NB	NB	SB
Directions Served	L	R	L	T	TR
Maximum Queue (m)	57.7	23.4	14.0	3.0	2.6
Average Queue (m)	25.3	11.6	5.0	0.1	0.1
95th Queue (m)	48.9	19.6	13.1	2.1	1.3
Link Distance (m)	102.1	102.1		206.3	137.8
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)			15.0		
Storage Blk Time (%)			1	0	
Queuing Penalty (veh)			2	0	

Intersection: 31: Bayview Drive & Medical Centre North D/W

Movement	EB	NB	NB	NB
Directions Served	LR	L	T	T
Maximum Queue (m)	30.0	10.4	59.6	38.1
Average Queue (m)	11.6	1.5	4.1	1.6
95th Queue (m)	25.3	7.2	30.0	17.4
Link Distance (m)	108.5		137.8	137.8
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)		15.0		
Storage Blk Time (%)		0	2	
Queuing Penalty (veh)		0	0	

Intersection: 33: Bayview Drive & Big Bay Point Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	TR	L
Maximum Queue (m)	74.9	162.2	149.9	75.0	77.3	72.7	65.6	24.2	88.2	99.8	78.8	39.5
Average Queue (m)	50.1	83.1	79.9	37.7	39.4	47.6	41.1	12.0	59.8	47.7	25.8	16.0
95th Queue (m)	87.2	142.3	133.5	81.4	65.2	66.8	61.6	20.4	88.9	88.1	60.1	30.6
Link Distance (m)		833.1	833.1			287.9	287.9			92.4	92.4	
Upstream Blk Time (%)									2	2	0	
Queuing Penalty (veh)									0	13	0	
Storage Bay Dist (m)	25.0			25.0	40.0			25.0	100.0			40.0
Storage Blk Time (%)	37	51	56	4	15	15	19	0	2	2		0
Queuing Penalty (veh)	132	90	123	16	36	38	27	0	4	11		0

Intersection: 33: Bayview Drive & Big Bay Point Road

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (m)	61.4	70.2	67.5
Average Queue (m)	34.7	30.1	31.3
95th Queue (m)	53.0	55.4	57.3
Link Distance (m)	101.3	101.3	
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		0	
Storage Bay Dist (m)			50.0
Storage Blk Time (%)	8	1	3
Queuing Penalty (veh)	7	2	5

Intersection: 39: Bryne Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	T	TR	L
Maximum Queue (m)	25.9	55.9	66.4	75.8	42.4	20.6	22.1	24.8	46.9	32.2	72.2	45.8
Average Queue (m)	11.4	27.7	35.2	32.9	17.9	4.1	2.8	2.9	22.4	15.5	31.7	21.0
95th Queue (m)	22.4	50.3	58.0	61.4	35.4	13.1	12.0	12.6	40.8	30.5	59.8	37.4
Link Distance (m)		286.6	286.6	286.6		65.4	65.4	65.4		97.4	97.4	
Upstream Blk Time (%)											0	
Queuing Penalty (veh)											0	
Storage Bay Dist (m)	60.0				50.0				45.0			50.0
Storage Blk Time (%)		0			0				1			0
Queuing Penalty (veh)		0			1				0			0

Intersection: 39: Bryne Drive & Mapleview Drive W

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (m)	45.6	33.4
Average Queue (m)	12.7	8.0
95th Queue (m)	30.2	19.2
Link Distance (m)	172.2	172.2
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 43: Bryne Road & Harvie Road/Big Bay Point Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	R
Maximum Queue (m)	10.4	84.3	78.2	8.9	43.6	70.2	74.5	29.4	21.4	43.0	36.3	18.9
Average Queue (m)	0.9	50.2	43.7	0.9	18.0	40.1	44.8	5.2	7.3	23.2	10.8	4.8
95th Queue (m)	5.4	72.8	66.7	5.1	35.9	62.8	66.6	18.1	17.2	38.0	25.8	12.4
Link Distance (m)		280.0	280.0			833.1	833.1			301.9	301.9	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	60.0			60.0	60.0			60.0	60.0			60.0
Storage Blk Time (%)		4	2		0	1	2					
Queuing Penalty (veh)		0	0		0	1	1					

Intersection: 43: Bryne Road & Harvie Road/Big Bay Point Road

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (m)	77.7	60.9	48.1	18.7
Average Queue (m)	38.8	20.6	12.8	6.2
95th Queue (m)	62.6	41.0	30.4	15.0
Link Distance (m)		249.9	249.9	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)	60.0			60.0
Storage Blk Time (%)	2			
Queuing Penalty (veh)	3			

Network Summary

Network wide Queuing Penalty: 1861

Queues
210498

9: Highway 400 NB Off-Ramp & Mapleview Drive W
2026 Future Total - PM Peak Hour (Mitigation)

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	735	1986	1708	1145	529	553
v/c Ratio	0.88	0.57	0.80	0.72	0.73	0.89
Control Delay	38.7	7.1	27.0	6.5	54.4	61.9
Queue Delay	0.0	0.9	0.0	0.0	0.0	0.0
Total Delay	38.7	8.0	27.0	6.5	54.4	61.9
Queue Length 50th (m)	78.2	144.1	91.2	42.0	68.0	73.7
Queue Length 95th (m)	m92.8	91.3	m121.7	m93.3	88.1	#105.0
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	924	3512	2144	1583	765	655
Starvation Cap Reductn	0	1123	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	0.80	0.83	0.80	0.72	0.69	0.84

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
210498

9: Highway 400 NB Off-Ramp & Mapleview Drive W
2026 Future Total - PM Peak Hour (Mitigation)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	735	1986	0	0	1708	1145	529	0	553	0	0	0
Future Volume (vph)	735	1986	0	0	1708	1145	529	0	553	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0			6.0	4.0	6.0		6.0			
Lane Util. Factor	0.97	0.91			0.91	1.00	0.97		0.88			
Frpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00			
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)	3433	5036			5085	1583	3433		2733			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3433	5036			5085	1583	3433		2733			
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)	735	1986	0	0	1708	1145	529	0	553	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	47	0	0	0
Lane Group Flow (vph)	735	1986	0	0	1708	1145	529	0	506	0	0	0
Confl. Peds. (#/hr)			3	3								
Heavy Vehicles (%)	2%	3%	0%	0%	2%	2%	2%	0%	4%	0%	0%	0%
Turn Type	Prot	NA			NA	Free	Prot		Perm			
Protected Phases	5	2			6		8					
Permitted Phases						Free			8			
Actuated Green, G (s)	31.8	90.7			54.9	130.0	27.3		27.3			
Effective Green, g (s)	31.8	90.7			54.9	130.0	27.3		27.3			
Actuated g/C Ratio	0.24	0.70			0.42	1.00	0.21		0.21			
Clearance Time (s)	4.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)	839	3513			2147	1583	720		573			
v/s Ratio Prot	c0.21	0.39			0.34		0.15					
v/s Ratio Perm						c0.72			c0.19			
v/c Ratio	0.88	0.57			0.80	0.72	0.73		0.88			
Uniform Delay, d1	47.2	9.8			32.7	0.0	48.0		49.8			
Progression Factor	0.67	0.67			0.76	1.00	1.00		1.00			
Incremental Delay, d2	6.1	0.4			1.1	1.0	3.9		15.0			
Delay (s)	37.5	6.9			26.0	1.0	51.9		64.8			
Level of Service	D	A			C	A	D		E			
Approach Delay (s)		15.2			16.0			58.5			0.0	
Approach LOS		B			B			E			A	

Intersection Summary

HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	88.6%	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	SBR
Lane Group Flow (vph)	438	1815	64	60	1522	266	827	80	234	50	505
v/c Ratio	0.96	0.92	0.09	0.38	0.98	0.43	0.92	0.17	0.98	0.20	0.92
Control Delay	82.7	33.3	0.6	24.2	51.9	6.8	62.2	33.4	110.7	53.6	60.0
Queue Delay	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.7	33.3	0.6	24.2	56.9	6.8	62.2	33.4	110.7	53.6	60.0
Queue Length 50th (m)	56.2	173.9	0.3	6.4	153.2	4.5	110.6	14.6	~68.9	12.3	116.5
Queue Length 95th (m)	m#91.1	#211.6	m1.3	m9.3	#179.4	m12.5	#144.7	28.2	#122.1	25.4	#187.8
Internal Link Dist (m)		225.6			141.6			127.2		94.6	
Turn Bay Length (m)	160.0		175.0	50.0			50.0		60.0		
Base Capacity (vph)	457	1972	695	163	1549	615	933	494	238	250	551
Starvation Cap Reductn	0	0	0	0	36	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	0.92	0.09	0.37	1.01	0.43	0.89	0.16	0.98	0.20	0.92

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)	438	1815	64	60	1522	266	827	65	15	234	50	505
Future Volume (vph)	438	1815	64	60	1522	266	827	65	15	234	50	505
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		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)	3502	4940	1578	1787	5036	1529	3467	1812		1805	1900	1615
Flt Permitted	0.95	1.00	1.00	0.10	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	4940	1578	188	5036	1529	3467	1812		1805	1900	1615
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)	438	1815	64	60	1522	266	827	65	15	234	50	505
RTOR Reduction (vph)	0	0	39	0	0	145	0	7	0	0	0	56
Lane Group Flow (vph)	438	1815	25	60	1522	121	827	73	0	234	50	449
Confl. Peds. (#/hr)	3		1	1		3			2	2		
Heavy Vehicles (%)	0%	5%	1%	1%	3%	4%	1%	2%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases			2	6		6						4
Actuated Green, G (s)	17.0	51.1	51.1	45.9	40.0	40.0	33.9	33.9		17.1	17.1	34.1
Effective Green, g (s)	17.0	51.1	51.1	45.9	40.0	40.0	33.9	33.9		17.1	17.1	34.1
Actuated g/C Ratio	0.13	0.39	0.39	0.35	0.31	0.31	0.26	0.26		0.13	0.13	0.26
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0
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	1941	620	138	1549	470	904	472		237	249	423
v/s Ratio Prot	0.13	c0.37		0.02	0.30		c0.24	0.04		0.13	0.03	c0.14
v/s Ratio Perm			0.02	0.13		0.08						0.14
v/c Ratio	0.96	0.94	0.04	0.43	0.98	0.26	0.91	0.16		0.99	0.20	1.06
Uniform Delay, d1	56.1	37.9	24.3	31.7	44.7	33.8	46.6	37.0		56.3	50.4	48.0
Progression Factor	0.97	0.68	0.56	1.01	0.80	0.61	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	28.2	8.1	0.1	1.6	15.6	0.9	13.5	0.2		54.4	0.4	60.9
Delay (s)	82.7	34.0	13.6	33.4	51.4	21.6	60.2	37.2		110.7	50.8	108.9
Level of Service	F	C	B	C	D	C	E	D		F	D	F
Approach Delay (s)		42.6			46.5			58.1			105.7	
Approach LOS		D			D			E			F	

Intersection Summary

HCM 2000 Control Delay	54.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	97.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (m)	83.7	91.2	107.4	87.4	91.9	134.6	96.0	78.2	98.8	97.2	84.6	95.8
Average Queue (m)	43.2	41.4	24.2	16.2	20.2	74.2	47.8	49.4	59.3	56.0	52.9	61.5
95th Queue (m)	73.5	76.2	75.2	56.2	61.7	111.8	76.2	69.5	93.6	83.4	77.8	87.6
Link Distance (m)		168.4	168.4	168.4	168.4	218.3	218.3	218.3			335.8	335.8
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	130.0								130.0	265.0		
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	NB
Directions Served	R
Maximum Queue (m)	81.8
Average Queue (m)	46.6
95th Queue (m)	77.1
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	265.0
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	L
Maximum Queue (m)	67.7	70.0	111.8	114.9	135.4	15.3	57.2	133.2	130.2	144.9	163.7	57.4
Average Queue (m)	43.4	48.7	65.8	64.4	76.4	4.3	16.1	72.9	111.0	131.3	114.6	55.0
95th Queue (m)	63.7	67.8	101.5	100.4	115.8	11.8	44.9	125.2	143.2	151.0	214.8	66.8
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)								0	0	14	13	
Queuing Penalty (veh)								2	1	62	58	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)								17				8
Queuing Penalty (veh)								10				32

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R
Maximum Queue (m)	140.8	134.8	67.4	100.6	100.6
Average Queue (m)	133.8	85.6	57.9	63.0	94.6
95th Queue (m)	136.8	181.2	77.0	133.5	121.1
Link Distance (m)	128.7	128.7		96.0	96.0
Upstream Blk Time (%)	76	14		20	61
Queuing Penalty (veh)	0	0		0	0
Storage Bay Dist (m)			60.0		
Storage Blk Time (%)	67		41		
Queuing Penalty (veh)	278		20		

Zone Summary

Zone wide Queuing Penalty: 462

Appendix F

2031 Background Synchro Analysis

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	27	1230	364	1970	5	4	152	250	35
v/c Ratio	0.15	0.42	0.69	0.66	0.03	0.04	0.57	0.75	0.05
Control Delay	6.7	4.6	60.4	6.7	31.8	48.2	11.9	52.3	30.2
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	6.7	4.6	60.4	6.8	31.8	48.2	11.9	52.3	30.2
Queue Length 50th (m)	0.4	7.3	42.8	49.6	0.9	0.9	0.0	50.8	2.5
Queue Length 95th (m)	m0.7	9.0	m58.2	62.3	3.9	4.5	11.5	74.6	7.6
Internal Link Dist (m)		85.3		118.2		85.0			175.8
Turn Bay Length (m)	70.0		65.0		20.0			40.0	
Base Capacity (vph)	175	2907	589	2992	191	310	412	332	838
Starvation Cap Reductn	0	0	0	186	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	0.15	0.42	0.62	0.70	0.03	0.01	0.37	0.75	0.04

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)	27	1223	7	364	1645	325	5	4	152	250	27	8
Future Volume (vph)	27	1223	7	364	1645	325	5	4	152	250	27	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0	6.0	4.0	6.0	
Lane Util. Factor	1.00	0.86		0.97	0.91		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.99	1.00	
Frt	1.00	1.00		1.00	0.98		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	6048		3467	4859		1733	1900	1560	1742	3467	
Flt Permitted	0.08	1.00		0.95	1.00		0.73	1.00	1.00	0.53	1.00	
Satd. Flow (perm)	153	6048		3467	4859		1338	1900	1560	978	3467	
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)	27	1223	7	364	1645	325	5	4	152	250	27	8
RTOR Reduction (vph)	0	1	0	0	22	0	0	0	139	0	6	0
Lane Group Flow (vph)	27	1229	0	364	1948	0	5	4	13	250	29	0
Confl. Peds. (#/hr)	2					2	1		7	7		1
Heavy Vehicles (%)	0%	8%	3%	1%	4%	3%	4%	0%	1%	3%	0%	1%
Turn Type	pm+pt	NA		Prot	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2						8		8	4		
Actuated Green, G (s)	53.5	49.7		16.7	62.6		10.7	9.6	9.6	27.6	22.5	
Effective Green, g (s)	53.5	49.7		16.7	62.6		10.7	9.6	9.6	27.6	22.5	
Actuated g/C Ratio	0.49	0.45		0.15	0.57		0.10	0.09	0.09	0.25	0.20	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0	6.0	4.0	6.0	
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)	131	2732		526	2765		134	165	136	342	709	
v/s Ratio Prot	0.01	0.20		c0.10	c0.40		0.00	0.00		c0.09	0.01	
v/s Ratio Perm	0.09						0.00		0.01	c0.09		
v/c Ratio	0.21	0.45		0.69	0.70		0.04	0.02	0.10	0.73	0.04	
Uniform Delay, d1	15.6	20.7		44.2	17.0		45.0	45.9	46.2	36.1	35.1	
Progression Factor	0.65	0.22		1.24	0.40		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.7	0.5		3.1	1.2		0.1	0.1	0.3	7.8	0.0	
Delay (s)	10.8	5.0		58.0	8.0		45.1	46.0	46.5	43.9	35.1	
Level of Service	B	A		E	A		D	D	D	D	D	
Approach Delay (s)		5.1			15.8			46.5			42.9	
Approach LOS		A			B			D			D	

Intersection Summary

HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	1435	188	417	1646	654	688
v/c Ratio	0.68	0.31	0.94	0.55	0.69	0.84
Control Delay	21.4	3.4	46.8	9.6	38.9	43.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.4	3.4	46.8	9.6	38.9	43.1
Queue Length 50th (m)	89.1	3.1	62.7	81.6	66.8	74.4
Queue Length 95th (m)	82.4	m4.4	#129.9	112.3	83.8	96.6
Internal Link Dist (m)	118.2			168.8		
Turn Bay Length (m)		45.0	135.0		300.0	300.0
Base Capacity (vph)	2115	611	494	3008	1071	916
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	43	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.31	0.84	0.56	0.61	0.75

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)	0	1435	188	417	1646	0	0	0	0	654	0	688
Future Volume (vph)	0	1435	188	417	1646	0	0	0	0	654	0	688
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	4.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	1.00	0.91					0.97		0.88
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		6225	1538	1626	4940					3367		2733
Flt Permitted		1.00	1.00	0.10	1.00					0.95		1.00
Satd. Flow (perm)		6225	1538	165	4940					3367		2733
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	1435	188	417	1646	0	0	0	0	654	0	688
RTOR Reduction (vph)	0	0	88	0	0	0	0	0	0	0	0	50
Lane Group Flow (vph)	0	1435	100	417	1646	0	0	0	0	654	0	638
Heavy Vehicles (%)	0%	5%	5%	11%	5%	0%	0%	0%	0%	4%	0%	4%
Turn Type		NA	Perm	pm+pt	NA					Prot		Perm
Protected Phases		2		1	6					4		
Permitted Phases			2	6								4
Actuated Green, G (s)		37.4	37.4	67.0	67.0					31.0		31.0
Effective Green, g (s)		37.4	37.4	67.0	67.0					31.0		31.0
Actuated g/C Ratio		0.34	0.34	0.61	0.61					0.28		0.28
Clearance Time (s)		6.0	6.0	4.0	6.0					6.0		6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		3.0
Lane Grp Cap (vph)		2116	522	440	3008					948		770
v/s Ratio Prot		0.23		c0.22	0.33					0.19		
v/s Ratio Perm			0.06	c0.36								c0.23
v/c Ratio		0.68	0.19	0.95	0.55					0.69		0.83
Uniform Delay, d1		31.1	25.6	31.6	12.6					35.2		37.0
Progression Factor		0.60	0.21	0.68	0.68					1.00		1.00
Incremental Delay, d2		1.6	0.7	25.6	0.6					2.1		7.4
Delay (s)		20.1	6.2	47.1	9.1					37.3		44.4
Level of Service		C	A	D	A					D		D
Approach Delay (s)		18.5			16.8			0.0			40.9	
Approach LOS		B			B			A			D	

Intersection Summary

HCM 2000 Control Delay	23.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	299	1790	1622	730	441	231
v/c Ratio	0.67	0.50	0.62	0.66	0.74	0.44
Control Delay	38.4	8.1	5.0	5.7	49.7	29.4
Queue Delay	0.0	0.3	0.0	1.2	0.0	0.0
Total Delay	38.4	8.4	5.0	7.0	49.7	29.4
Queue Length 50th (m)	21.8	105.2	15.5	1.4	49.0	18.2
Queue Length 95th (m)	33.5	121.1	m19.2	m29.7	62.4	29.8
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	499	3556	2601	1114	825	703
Starvation Cap Reductn	0	960	0	191	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.69	0.62	0.79	0.53	0.33

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)	299	1790	0	0	1622	730	441	0	231	0	0	0
Future Volume (vph)	299	1790	0	0	1622	730	441	0	231	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0			6.0	6.0	6.0		6.0			
Lane Util. Factor	0.97	0.91			0.91	1.00	0.97		0.88			
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)	3213	5036			4893	1468	3242		2561			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3213	5036			4893	1468	3242		2561			
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)	299	1790	0	0	1622	730	441	0	231	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	334	0	0	56	0	0	0
Lane Group Flow (vph)	299	1790	0	0	1622	396	441	0	175	0	0	0
Heavy Vehicles (%)	9%	3%	0%	0%	6%	10%	8%	0%	11%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Prot		Perm			
Protected Phases	5	2			6		8					
Permitted Phases						6			8			
Actuated Green, G (s)	15.2	77.7			58.5	58.5	20.3		20.3			
Effective Green, g (s)	15.2	77.7			58.5	58.5	20.3		20.3			
Actuated g/C Ratio	0.14	0.71			0.53	0.53	0.18		0.18			
Clearance Time (s)	4.0	6.0			6.0	6.0	6.0		6.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0			
Lane Grp Cap (vph)	443	3557			2602	780	598		472			
v/s Ratio Prot	c0.09	0.36			c0.33		c0.14					
v/s Ratio Perm						0.27			0.07			
v/c Ratio	0.67	0.50			0.62	0.51	0.74		0.37			
Uniform Delay, d1	45.1	7.4			18.0	16.5	42.3		39.3			
Progression Factor	0.73	0.98			0.23	2.34	1.00		1.00			
Incremental Delay, d2	3.0	0.4			0.5	1.1	4.7		0.5			
Delay (s)	35.7	7.6			4.7	39.7	47.1		39.7			
Level of Service	D	A			A	D	D		D			
Approach Delay (s)		11.6			15.6			44.6			0.0	
Approach LOS		B			B			D			A	

Intersection Summary

HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
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)	321	1501	28	13	2004	90	171	39	27	10	178
v/c Ratio	0.50	0.48	0.03	0.05	0.96	0.13	0.48	0.20	0.19	0.07	0.62
Control Delay	63.4	4.2	0.0	4.2	21.0	0.2	51.0	24.2	49.7	46.5	16.9
Queue Delay	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.4	4.2	0.0	4.2	23.0	0.2	51.0	24.2	49.7	46.5	16.9
Queue Length 50th (m)	38.6	10.9	0.0	0.4	47.9	0.1	19.2	2.5	5.9	2.2	0.0
Queue Length 95th (m)	55.0	32.7	m0.0	m0.6	m#199.0	m0.0	29.6	12.7	14.3	7.5	20.7
Internal Link Dist (m)		225.6			141.6			127.2		94.6	
Turn Bay Length (m)	160.0		175.0	50.0			50.0		60.0		
Base Capacity (vph)	636	3113	986	261	2088	708	1103	555	139	146	287
Starvation Cap Reductn	0	0	0	0	38	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	0.50	0.48	0.03	0.05	0.98	0.13	0.16	0.07	0.19	0.07	0.62

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)	321	1501	28	13	2004	90	171	12	27	27	10	178
Future Volume (vph)	321	1501	28	13	2004	90	171	12	27	27	10	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90		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)	3367	4893	1476	1805	4848	1475	3467	1687		1805	1900	1599
Flt Permitted	0.95	1.00	1.00	0.16	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3367	4893	1476	308	4848	1475	3467	1687		1805	1900	1599
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)	321	1501	28	13	2004	90	171	12	27	27	10	178
RTOR Reduction (vph)	0	0	11	0	0	51	0	24	0	0	0	164
Lane Group Flow (vph)	321	1501	17	13	2004	39	171	15	0	27	10	14
Confl. Peds. (#/hr)	2		1	1		2			1	1		
Heavy Vehicles (%)	4%	6%	8%	0%	7%	8%	1%	0%	0%	0%	0%	1%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2	6		6						4
Actuated Green, G (s)	20.8	66.8	66.8	48.8	47.4	47.4	11.3	11.3		8.5	8.5	8.5
Effective Green, g (s)	20.8	66.8	66.8	48.8	47.4	47.4	11.3	11.3		8.5	8.5	8.5
Actuated g/C Ratio	0.19	0.61	0.61	0.44	0.43	0.43	0.10	0.10		0.08	0.08	0.08
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	636	2971	896	155	2089	635	356	173		139	146	123
v/s Ratio Prot	c0.10	0.31		0.00	c0.41		c0.05	0.01		c0.01	0.01	
v/s Ratio Perm			0.01	0.04		0.03						0.01
v/c Ratio	0.50	0.51	0.02	0.08	0.96	0.06	0.48	0.09		0.19	0.07	0.11
Uniform Delay, d1	40.0	12.2	8.6	17.1	30.4	18.3	46.6	44.7		47.5	47.1	47.2
Progression Factor	1.49	0.32	1.00	0.48	0.43	0.06	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	0.5	0.0	0.1	5.8	0.1	1.0	0.2		0.7	0.2	0.4
Delay (s)	60.0	4.4	8.6	8.3	19.0	1.1	47.6	44.9		48.2	47.3	47.6
Level of Service	E	A	A	A	B	A	D	D		D	D	D
Approach Delay (s)		14.1			18.2			47.1			47.7	
Approach LOS		B			B			D			D	

Intersection Summary

HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	73.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	404	861	289	59	1676	104	65	351	175	469
v/c Ratio	0.88	0.38	0.35	0.18	0.96	0.58	0.08	0.83	0.21	0.93
Control Delay	79.6	15.6	3.3	14.8	48.9	64.1	13.2	48.8	31.2	51.1
Queue Delay	0.0	0.0	0.0	0.0	15.7	0.0	0.0	0.0	0.0	0.3
Total Delay	79.6	15.6	3.3	14.8	64.5	64.1	13.2	48.8	31.2	51.4
Queue Length 50th (m)	~57.5	30.1	3.0	6.4	133.5	12.0	1.9	58.7	15.4	65.6
Queue Length 95th (m)	#90.1	29.0	17.0	13.3	#169.0	#21.5	7.3	#102.8	24.5	#127.3
Internal Link Dist (m)		141.6			238.0		219.7		226.0	
Turn Bay Length (m)	70.0		50.0	120.0		95.0		110.0		45.0
Base Capacity (vph)	457	2262	818	322	1745	178	944	424	960	544
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	120	0	0	0	0	4
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.38	0.35	0.18	1.03	0.58	0.07	0.83	0.18	0.87

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)	404	861	289	59	1534	142	104	23	42	351	175	469
Future Volume (vph)	404	861	289	59	1534	142	104	23	42	351	175	469
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3213	4988	1458	1718	4899		3019	3096		1626	3252	1417
Flt Permitted	0.95	1.00	1.00	0.32	1.00		0.95	1.00		0.61	1.00	1.00
Satd. Flow (perm)	3213	4988	1458	573	4899		3019	3096		1051	3252	1417
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)	404	861	289	59	1534	142	104	23	42	351	175	469
RTOR Reduction (vph)	0	0	163	0	10	0	0	32	0	0	0	129
Lane Group Flow (vph)	404	861	126	59	1666	0	104	33	0	351	175	340
Confl. Peds. (#/hr)	1		3	3		1						
Heavy Vehicles (%)	9%	4%	9%	5%	4%	9%	16%	15%	0%	11%	11%	14%
Turn Type	Prot	NA	Perm	pm+pt	NA		Prot	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)	15.7	47.9	47.9	43.4	37.8		6.5	25.0		40.5	30.0	30.0
Effective Green, g (s)	15.7	47.9	47.9	43.4	37.8		6.5	25.0		40.5	30.0	30.0
Actuated g/C Ratio	0.14	0.44	0.44	0.39	0.34		0.06	0.23		0.37	0.27	0.27
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
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)	458	2172	634	284	1683		178	703		447	886	386
v/s Ratio Prot	c0.13	0.17		0.01	c0.34		0.03	0.01		c0.08	0.05	
v/s Ratio Perm			0.09	0.07						0.21		c0.24
v/c Ratio	0.88	0.40	0.20	0.21	0.99		0.58	0.05		0.79	0.20	0.88
Uniform Delay, d1	46.2	21.2	19.2	20.9	35.9		50.4	33.2		30.0	30.7	38.3
Progression Factor	1.31	0.71	0.83	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	19.3	0.5	0.6	0.4	19.7		4.8	0.0		8.8	0.1	19.8
Delay (s)	80.1	15.4	16.6	21.2	55.6		55.3	33.2		38.8	30.9	58.0
Level of Service	F	B	B	C	E		E	C		D	C	E
Approach Delay (s)		32.5			54.4			46.8			46.5	
Approach LOS		C			D			D			D	

Intersection Summary

HCM 2000 Control Delay	44.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	88.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	69	14	6	60	508	7	998
v/c Ratio	0.20	0.11	0.01	0.16	0.19	0.01	0.44
Control Delay	14.3	36.8	0.0	4.2	5.0	3.6	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.3	36.8	0.0	4.2	5.0	3.6	9.4
Queue Length 50th (m)	0.4	2.4	0.0	2.0	11.1	0.3	45.5
Queue Length 95th (m)	7.5	8.0	0.0	7.3	35.7	1.7	82.0
Internal Link Dist (m)	115.4		50.9		226.0		199.1
Turn Bay Length (m)				70.0		50.0	
Base Capacity (vph)	737	126	740	387	2638	750	2255
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.11	0.01	0.16	0.19	0.01	0.44

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	0	33	14	0	6	60	490	18	7	949	49
Future Volume (vph)	36	0	33	14	0	6	60	490	18	7	949	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor		0.95		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.93		1.00	0.85		1.00	0.99		1.00	0.99	
Flt Protected		0.97		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3130		1203	1615		1517	3394		1805	3186	
Flt Permitted		0.82		0.47	1.00		0.24	1.00		0.47	1.00	
Satd. Flow (perm)		2643		594	1615		380	3394		884	3186	
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)	36	0	33	14	0	6	60	490	18	7	949	49
RTOR Reduction (vph)	0	59	0	0	5	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	10	0	14	1	0	60	507	0	7	996	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	1%	0%	8%	50%	0%	0%	19%	6%	0%	0%	13%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		7.8		13.1	13.1		77.2	71.9		69.1	67.8	
Effective Green, g (s)		7.8		13.1	13.1		77.2	71.9		69.1	67.8	
Actuated g/C Ratio		0.08		0.13	0.13		0.75	0.70		0.68	0.66	
Clearance Time (s)		6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		201		83	206		346	2385		608	2111	
v/s Ratio Prot				c0.00	0.00		c0.01	0.15		0.00	c0.31	
v/s Ratio Perm		0.00		c0.02			0.12			0.01		
v/c Ratio		0.05		0.17	0.00		0.17	0.21		0.01	0.47	
Uniform Delay, d1		43.8		39.4	38.9		4.0	5.3		5.4	8.5	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1		1.0	0.0		0.2	0.2		0.0	0.8	
Delay (s)		43.9		40.4	38.9		4.3	5.5		5.4	9.2	
Level of Service		D		D	D		A	A		A	A	
Approach Delay (s)		43.9			39.9			5.4			9.2	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	102.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	68.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	WBL	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	39	25	5	50	480	5	1028
v/c Ratio	0.18	0.07	0.04	0.10	0.17	0.01	0.40
Control Delay	37.6	0.4	45.0	3.5	4.5	3.6	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.6	0.4	45.0	3.5	4.5	3.6	7.8
Queue Length 50th (m)	6.8	0.0	0.9	1.6	10.4	0.2	47.0
Queue Length 95th (m)	16.3	0.0	4.9	6.2	33.6	1.3	84.5
Internal Link Dist (m)					199.1		252.7
Turn Bay Length (m)	25.0			70.0		70.0	
Base Capacity (vph)	234	429	160	516	2810	823	2547
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.06	0.03	0.10	0.17	0.01	0.40

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	0	25	5	0	0	50	480	0	5	975	53
Future Volume (vph)	39	0	25	5	0	0	50	480	0	5	975	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		6.0	4.0			4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00		1.00	1.00			1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Frt	1.00		0.85	1.00			1.00	1.00		1.00	0.99	
Flt Protected	0.95		1.00	0.95			0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1687		961	1805			1805	3406		1805	3272	
Flt Permitted	0.95		1.00	0.00			0.24	1.00		0.48	1.00	
Satd. Flow (perm)	1687		961	0			457	3406		908	3272	
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	0	25	5	0	0	50	480	0	5	975	53
RTOR Reduction (vph)	0	0	24	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	39	0	1	5	0	0	50	480	0	5	1026	0
Confl. Peds. (#/hr)	1											
Heavy Vehicles (%)	7%	0%	68%	0%	0%	0%	0%	6%	0%	0%	10%	0%
Turn Type	pm+pt		Perm	pm+pt			pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	12.8		5.6	1.2			76.5	72.6		71.1	69.9	
Effective Green, g (s)	12.8		5.6	1.2			76.5	72.6		71.1	69.9	
Actuated g/C Ratio	0.13		0.06	0.01			0.76	0.72		0.71	0.69	
Clearance Time (s)	4.0		6.0	4.0			4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0			3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	214		53	21			399	2458		652	2273	
v/s Ratio Prot	c0.02			0.00			c0.00	0.14		0.00	c0.31	
v/s Ratio Perm			0.00				0.09			0.01		
v/c Ratio	0.18		0.03	0.24			0.13	0.20		0.01	0.45	
Uniform Delay, d1	39.2		44.9	49.2			3.5	4.5		4.3	6.8	
Progression Factor	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4		0.2	5.8			0.1	0.2		0.0	0.6	
Delay (s)	39.6		45.1	55.0			3.6	4.7		4.3	7.5	
Level of Service	D		D	E			A	A		A	A	
Approach Delay (s)		41.8			55.0			4.6			7.5	
Approach LOS		D			E			A			A	

Intersection Summary

HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	100.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	33	23	36	189	30	420	74	1014
v/c Ratio	0.16	0.06	0.14	0.32	0.13	0.20	0.11	0.48
Control Delay	37.2	0.3	34.2	1.5	6.2	10.0	5.3	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.2	0.3	34.2	1.5	6.2	10.0	5.3	11.9
Queue Length 50th (m)	6.8	0.0	6.1	0.0	1.7	21.4	4.4	65.2
Queue Length 95th (m)	14.0	0.0	15.0	0.0	4.8	32.0	9.2	87.7
Internal Link Dist (m)				203.0		252.7		204.9
Turn Bay Length (m)	50.0	50.0	30.0		70.0		65.0	
Base Capacity (vph)	224	588	259	690	255	2097	673	2119
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	0.15	0.04	0.14	0.27	0.12	0.20	0.11	0.48

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	0	23	36	0	189	30	419	1	74	974	40
Future Volume (vph)	33	0	23	36	0	189	30	419	1	74	974	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00		1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00		0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00		0.85	1.00	0.85		1.00	1.00		1.00	0.99	
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805		1593	1734	1346		1031	3404		1624	3301	
Flt Permitted	0.50		1.00	0.56	1.00		0.24	1.00		0.49	1.00	
Satd. Flow (perm)	943		1593	1028	1346		261	3404		844	3301	
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)	33	0	23	36	0	189	30	419	1	74	974	40
RTOR Reduction (vph)	0	0	21	0	168	0	0	0	0	0	2	0
Lane Group Flow (vph)	33	0	2	36	21	0	30	420	0	74	1012	0
Confl. Peds. (#/hr)			1	1			5		4	4		5
Heavy Vehicles (%)	0%	0%	0%	4%	0%	20%	75%	6%	4%	11%	9%	0%
Turn Type	pm+pt		Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	12.9		8.4	18.7	11.3		65.7	61.6		68.9	63.2	
Effective Green, g (s)	12.9		8.4	18.7	11.3		65.7	61.6		68.9	63.2	
Actuated g/C Ratio	0.13		0.08	0.18	0.11		0.64	0.60		0.67	0.61	
Clearance Time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	155		129	237	147		196	2033		607	2023	
v/s Ratio Prot	c0.01			c0.01	0.02		0.01	0.12		c0.01	c0.31	
v/s Ratio Perm	c0.02		0.00	0.02			0.09			0.07		
v/c Ratio	0.21		0.01	0.15	0.14		0.15	0.21		0.12	0.50	
Uniform Delay, d1	40.2		43.5	35.3	41.5		7.4	9.5		6.0	11.1	
Progression Factor	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7		0.0	0.3	0.4		0.4	0.2		0.1	0.9	
Delay (s)	40.9		43.6	35.6	42.0		7.8	9.8		6.0	12.0	
Level of Service	D		D	D	D		A	A		A	B	
Approach Delay (s)		42.0			40.9			9.6			11.6	
Approach LOS		D			D			A			B	

Intersection Summary

HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	103.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	0	3	14	0	6	9	562	54	14	908	26
Future Volume (Veh/h)	6	0	3	14	0	6	9	562	54	14	908	26
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	6	0	3	14	0	6	9	562	54	14	908	26
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								229				
pX, platoon unblocked	0.98	0.98		0.98	0.98	0.98				0.98		
vC, conflicting volume	1254	1583	467	1092	1569	308	934			616		
vC1, stage 1 conf vol	949	949		607	607							
vC2, stage 2 conf vol	305	634		485	962							
vCu, unblocked vol	1217	1553	467	1051	1538	250	934			565		
tC, single (s)	7.5	6.5	6.9	8.3	6.5	6.9	4.1			4.2		
tC, 2 stage (s)	6.5	5.5		7.3	5.5							
tF (s)	3.5	4.0	3.3	3.9	4.0	3.3	2.2			2.3		
p0 queue free %	98	100	99	95	100	99	99			99		
cM capacity (veh/h)	262	282	542	305	278	740	729			955		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	9	20	9	375	241	14	605	329
Volume Left	6	14	9	0	0	14	0	0
Volume Right	3	6	0	0	54	0	0	26
cSH	317	370	729	1700	1700	955	1700	1700
Volume to Capacity	0.03	0.05	0.01	0.22	0.14	0.01	0.36	0.19
Queue Length 95th (m)	0.7	1.4	0.3	0.0	0.0	0.4	0.0	0.0
Control Delay (s)	16.7	15.3	10.0	0.0	0.0	8.8	0.0	0.0
Lane LOS	C	C	B			A		
Approach Delay (s)	16.7	15.3	0.1			0.1		
Approach LOS	C	C						

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	35.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	27	25	102	471	922	113
Future Volume (Veh/h)	27	25	102	471	922	113
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	27	25	102	471	922	113
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)					276	
pX, platoon unblocked	0.99	0.99	0.99			
vC, conflicting volume	1418	518	1035			
vC1, stage 1 conf vol	978					
vC2, stage 2 conf vol	440					
vCu, unblocked vol	1394	480	1005			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	95	85			
cM capacity (veh/h)	294	529	687			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	27	25	102	236	236	615	420
Volume Left	27	0	102	0	0	0	0
Volume Right	0	25	0	0	0	0	113
cSH	294	529	687	1700	1700	1700	1700
Volume to Capacity	0.09	0.05	0.15	0.14	0.14	0.36	0.25
Queue Length 95th (m)	2.4	1.2	4.2	0.0	0.0	0.0	0.0
Control Delay (s)	18.5	12.1	11.2	0.0	0.0	0.0	0.0
Lane LOS	C	B	B				
Approach Delay (s)	15.4		2.0			0.0	
Approach LOS	C						

Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	48.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	6	25	462	1016	26
Future Volume (Veh/h)	9	6	25	462	1016	26
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	9	6	25	462	1016	26
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)					122	
pX, platoon unblocked	0.95	0.95	0.95			
vC, conflicting volume	1310	521	1042			
vC1, stage 1 conf vol	1029					
vC2, stage 2 conf vol	281					
vCu, unblocked vol	1229	403	949			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	99	96			
cM capacity (veh/h)	312	575	699			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	15	25	231	231	677	365
Volume Left	9	25	0	0	0	0
Volume Right	6	0	0	0	0	26
cSH	382	699	1700	1700	1700	1700
Volume to Capacity	0.04	0.04	0.14	0.14	0.40	0.21
Queue Length 95th (m)	1.0	0.9	0.0	0.0	0.0	0.0
Control Delay (s)	14.8	10.3	0.0	0.0	0.0	0.0
Lane LOS	B	B				
Approach Delay (s)	14.8	0.5			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	38.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	136	636	408	393	634	232	111	351	51	239	288
v/c Ratio	0.38	0.60	0.65	0.81	0.45	0.31	0.30	0.38	0.15	0.27	0.56
Control Delay	17.2	36.0	21.5	29.5	24.1	8.1	27.7	34.4	25.6	35.0	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
Total Delay	17.2	36.0	21.5	29.5	24.1	8.1	27.7	34.4	25.6	35.0	9.0
Queue Length 50th (m)	14.5	64.1	37.6	49.7	54.0	10.1	16.7	33.6	7.4	22.8	0.0
Queue Length 95th (m)	24.5	93.0	80.9	80.3	69.6	26.3	33.5	52.7	17.8	37.5	25.6
Internal Link Dist (m)		842.4			279.6			97.5		104.6	
Turn Bay Length (m)	25.0		25.0	40.0		25.0	100.0		40.0		50.0
Base Capacity (vph)	367	1067	628	581	1646	838	372	936	340	875	512
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	0.37	0.60	0.65	0.68	0.39	0.28	0.30	0.38	0.15	0.27	0.56

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	136	636	408	393	634	232	111	307	44	51	239	288
Future Volume (vph)	136	636	408	393	634	232	111	307	44	51	239	288
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
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)	1641	3406	1538	1736	3343	1538	1595	3308		1610	3374	1151
Flt Permitted	0.41	1.00	1.00	0.25	1.00	1.00	0.57	1.00		0.51	1.00	1.00
Satd. Flow (perm)	710	3406	1538	448	3343	1538	957	3308		863	3374	1151
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)	136	636	408	393	634	232	111	307	44	51	239	288
RTOR Reduction (vph)	0	0	147	0	0	92	0	9	0	0	0	212
Lane Group Flow (vph)	136	636	261	393	634	140	111	342	0	51	239	76
Confl. Peds. (#/hr)							3		2	2		3
Heavy Vehicles (%)	10%	6%	5%	4%	8%	5%	13%	7%	6%	12%	7%	38%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	43.7	35.1	35.1	59.8	47.2	47.2	38.4	31.4		35.4	29.9	29.9
Effective Green, g (s)	43.7	35.1	35.1	59.8	47.2	47.2	38.4	31.4		35.4	29.9	29.9
Actuated g/C Ratio	0.39	0.31	0.31	0.53	0.42	0.42	0.34	0.28		0.31	0.27	0.27
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	6.0
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)	346	1060	479	474	1400	644	365	921		307	895	305
v/s Ratio Prot	0.03	0.19		c0.15	0.19		c0.02	c0.10		0.01	0.07	
v/s Ratio Perm	0.12		0.17	c0.29		0.09	0.08			0.04		0.07
v/c Ratio	0.39	0.60	0.55	0.83	0.45	0.22	0.30	0.37		0.17	0.27	0.25
Uniform Delay, d1	23.0	32.9	32.2	18.4	23.5	20.9	26.3	32.7		27.4	32.7	32.6
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	0.7	0.9	1.3	11.4	0.2	0.2	0.5	1.2		0.3	0.7	2.0
Delay (s)	23.8	33.8	33.5	29.8	23.7	21.1	26.8	33.9		27.6	33.5	34.5
Level of Service	C	C	C	C	C	C	C	C		C	C	C
Approach Delay (s)		32.5			25.1			32.2			33.5	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	112.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	93.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	41	1316	373	1286	94	52	29	172
v/c Ratio	0.14	0.58	0.75	0.41	0.44	0.14	0.13	0.43
Control Delay	9.1	24.6	50.6	5.8	43.5	22.4	36.1	20.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.1	24.6	50.6	5.8	43.5	22.4	36.1	20.3
Queue Length 50th (m)	2.4	81.5	67.4	16.6	17.8	1.7	5.3	6.0
Queue Length 95th (m)	5.6	108.5	100.9	29.2	32.9	8.0	13.4	16.9
Internal Link Dist (m)		279.4		63.9		107.8		187.7
Turn Bay Length (m)	60.0		25.0		45.0		50.0	
Base Capacity (vph)	309	2251	514	3175	216	751	223	871
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	0.13	0.58	0.73	0.41	0.44	0.07	0.13	0.20

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	1191	125	373	1204	82	94	16	36	29	54	118
Future Volume (vph)	41	1191	125	373	1204	82	94	16	36	29	54	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.90		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	4875		1752	4850		1656	2953		1570	3188	
Flt Permitted	0.20	1.00		0.12	1.00		0.56	1.00		0.72	1.00	
Satd. Flow (perm)	386	4875		224	4850		979	2953		1192	3188	
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)	41	1191	125	373	1204	82	94	16	36	29	54	118
RTOR Reduction (vph)	0	9	0	0	5	0	0	32	0	0	106	0
Lane Group Flow (vph)	41	1307	0	373	1281	0	94	20	0	29	66	0
Confl. Peds. (#/hr)			5	5								
Heavy Vehicles (%)	0%	5%	2%	3%	6%	5%	9%	4%	12%	15%	5%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	53.1	48.9		76.9	68.7		18.7	12.6		15.5	11.0	
Effective Green, g (s)	53.1	48.9		76.9	68.7		18.7	12.6		15.5	11.0	
Actuated g/C Ratio	0.48	0.44		0.70	0.62		0.17	0.11		0.14	0.10	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	240	2167		489	3029		203	338		183	318	
v/s Ratio Prot	0.01	0.27		c0.17	0.26		c0.03	0.01		0.01	0.02	
v/s Ratio Perm	0.08			c0.37			c0.05			0.02		
v/c Ratio	0.17	0.60		0.76	0.42		0.46	0.06		0.16	0.21	
Uniform Delay, d1	15.1	23.2		23.0	10.5		40.2	43.4		41.4	45.5	
Progression Factor	1.00	1.00		2.25	0.55		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	1.3		5.3	0.3		1.7	0.1		0.4	0.3	
Delay (s)	15.4	24.4		57.2	6.1		41.9	43.5		41.8	45.8	
Level of Service	B	C		E	A		D	D		D	D	
Approach Delay (s)		24.2			17.6			42.4			45.2	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	23.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	77.3%	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)	9	570	11	78	368	159	15	110	105	136	270	87
v/c Ratio	0.02	0.35	0.02	0.24	0.23	0.20	0.03	0.07	0.14	0.24	0.17	0.12
Control Delay	18.3	22.1	1.9	22.7	20.4	3.5	19.1	19.2	4.1	22.1	20.3	4.4
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	18.3	22.1	1.9	22.7	20.4	3.5	19.1	19.2	4.1	22.1	20.3	4.4
Queue Length 50th (m)	1.2	47.3	0.0	11.6	28.6	0.0	2.0	8.0	0.0	20.5	20.6	0.0
Queue Length 95th (m)	4.4	61.4	1.4	23.5	39.3	12.2	6.3	13.7	10.2	35.2	29.7	9.4
Internal Link Dist (m)		263.0			842.4			272.7			130.1	
Turn Bay Length (m)	60.0		60.0	60.0		60.0	60.0		60.0	60.0		60.0
Base Capacity (vph)	434	1607	733	322	1607	805	485	1577	763	566	1577	753
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	0.02	0.35	0.02	0.24	0.23	0.20	0.03	0.07	0.14	0.24	0.17	0.12

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	570	11	78	368	159	15	110	105	136	270	87
Future Volume (vph)	9	570	11	78	368	159	15	110	105	136	270	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	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)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.51	1.00	1.00	0.38	1.00	1.00	0.59	1.00	1.00	0.68	1.00	1.00
Satd. Flow (perm)	958	3539	1583	709	3539	1583	1091	3539	1583	1271	3539	1583
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)	9	570	11	78	368	159	15	110	105	136	270	87
RTOR Reduction (vph)	0	0	6	0	0	87	0	0	58	0	0	48
Lane Group Flow (vph)	9	570	5	78	368	72	15	110	47	136	270	39
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	54.5	54.5	54.5	54.5	54.5	54.5	53.5	53.5	53.5	53.5	53.5	53.5
Effective Green, g (s)	54.5	54.5	54.5	54.5	54.5	54.5	53.5	53.5	53.5	53.5	53.5	53.5
Actuated g/C Ratio	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Grp Cap (vph)	435	1607	718	322	1607	718	486	1577	705	566	1577	705
v/s Ratio Prot		c0.16			0.10			0.03			0.08	
v/s Ratio Perm	0.01		0.00	0.11		0.05	0.01		0.03	c0.11		0.02
v/c Ratio	0.02	0.35	0.01	0.24	0.23	0.10	0.03	0.07	0.07	0.24	0.17	0.06
Uniform Delay, d1	18.0	21.3	17.9	20.1	20.0	18.7	18.7	19.0	19.0	20.6	19.9	18.9
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	0.1	0.6	0.0	1.8	0.3	0.3	0.1	0.1	0.2	1.0	0.2	0.1
Delay (s)	18.1	21.9	18.0	21.9	20.3	19.0	18.8	19.1	19.2	21.6	20.2	19.0
Level of Service	B	C	B	C	C	B	B	B	B	C	C	B
Approach Delay (s)		21.8			20.2			19.1			20.4	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	B38	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	TR	T	L	L	T	T	TR	L
Maximum Queue (m)	21.1	68.6	79.7	67.9	52.2	8.2	54.6	61.0	61.3	69.8	82.9	9.8
Average Queue (m)	6.9	19.6	23.9	13.2	13.9	0.4	30.9	37.5	27.4	34.3	46.7	1.2
95th Queue (m)	16.4	48.6	56.0	39.4	34.9	4.1	48.7	54.6	52.5	60.2	74.6	6.2
Link Distance (m)		86.5	86.5	86.5	86.5	66.0			114.0	114.0	114.0	
Upstream Blk Time (%)		0	0	0								
Queuing Penalty (veh)		0	1	0								
Storage Bay Dist (m)	70.0						65.0	65.0				20.0
Storage Blk Time (%)		0					0	0	0			
Queuing Penalty (veh)		0					0	1	1			

Intersection: 3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

Movement	NB	NB	SB	SB	SB
Directions Served	T	R	L	T	TR
Maximum Queue (m)	8.8	35.2	47.4	117.2	30.2
Average Queue (m)	1.0	17.9	40.7	41.8	4.0
95th Queue (m)	5.5	30.7	54.6	108.3	17.9
Link Distance (m)	85.8	85.8		180.4	180.4
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)			40.0		
Storage Blk Time (%)			33	1	
Queuing Penalty (veh)			4	2	

Intersection: 6: Mapleview Drive W & Highway 400 SB Off-Ramp

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	T	R	L	T	T	T	L	L	R
Maximum Queue (m)	124.8	120.6	108.0	85.7	60.5	126.2	113.1	63.8	78.2	269.5	302.2	270.6
Average Queue (m)	65.1	75.4	55.4	41.3	11.5	63.1	39.3	33.7	43.8	193.7	212.8	103.0
95th Queue (m)	122.3	123.3	104.1	74.8	35.3	119.1	81.5	56.6	69.8	315.1	336.7	262.8
Link Distance (m)	114.0	114.0	114.0	114.0			168.4	168.4	168.4		326.9	326.9
Upstream Blk Time (%)	1	2	0				0				8	2
Queuing Penalty (veh)	5	6	0				1				0	0
Storage Bay Dist (m)					45.0	135.0				300.0		
Storage Blk Time (%)				7	0	1				1	10	2
Queuing Penalty (veh)				13	0	6				4	34	5

Intersection: 6: Mapleview Drive W & Highway 400 SB Off-Ramp

Movement	SB	B36	B36
Directions Served	R	T	T
Maximum Queue (m)	245.1	45.8	40.8
Average Queue (m)	79.0	9.8	8.6
95th Queue (m)	210.6	66.1	62.5
Link Distance (m)		176.9	176.9
Upstream Blk Time (%)		0	0
Queuing Penalty (veh)		0	0
Storage Bay Dist (m)	300.0		
Storage Blk Time (%)	0		
Queuing Penalty (veh)	1		

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (m)	52.6	49.8	124.2	87.3	78.2	89.0	44.4	47.8	94.7	79.0	79.4	60.0
Average Queue (m)	22.4	23.9	26.0	18.0	19.7	37.5	17.9	23.3	42.9	42.8	42.7	24.2
95th Queue (m)	42.3	43.4	86.2	60.3	59.0	70.2	34.2	40.6	74.7	69.0	68.0	46.7
Link Distance (m)		168.4	168.4	168.4	168.4	218.3	218.3	218.3			335.8	335.8
Upstream Blk Time (%)			0									
Queuing Penalty (veh)			0									
Storage Bay Dist (m)	130.0								130.0	265.0		
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	NB
Directions Served	R
Maximum Queue (m)	44.0
Average Queue (m)	9.3
95th Queue (m)	27.7
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	265.0
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	L
Maximum Queue (m)	64.7	70.1	71.2	49.7	56.2	16.4	28.9	112.6	128.0	143.1	131.4	35.9
Average Queue (m)	34.4	40.5	29.3	23.7	33.6	2.6	3.7	58.1	66.1	89.3	27.4	10.9
95th Queue (m)	53.3	59.3	53.6	40.5	50.1	10.2	16.8	97.7	119.8	137.2	109.8	25.2
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)								0	0	2	2	
Queuing Penalty (veh)								0	1	11	9	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)								17				
Queuing Penalty (veh)								2				

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R
Maximum Queue (m)	50.7	19.5	21.2	11.6	59.2
Average Queue (m)	24.7	5.2	6.6	1.7	24.1
95th Queue (m)	44.9	14.0	17.2	7.3	47.0
Link Distance (m)	128.7	128.7		96.0	96.0
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)			60.0		
Storage Blk Time (%)	1				
Queuing Penalty (veh)	0				

Intersection: 15: Bayview Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	T	R	L	T	T	TR	L	L
Maximum Queue (m)	69.2	72.6	33.5	38.0	38.1	51.2	119.9	252.9	257.9	262.2	35.1	52.8
Average Queue (m)	39.0	41.1	9.9	13.6	16.6	18.8	17.1	206.3	248.9	252.1	11.6	21.4
95th Queue (m)	61.3	62.1	25.3	30.2	32.2	37.1	71.1	301.2	255.8	259.0	28.7	43.5
Link Distance (m)			131.2	131.2	131.2			244.4	244.4	244.4		
Upstream Blk Time (%)								6	45	87		
Queuing Penalty (veh)								0	0	0		
Storage Bay Dist (m)	70.0	70.0				50.0	120.0				95.0	95.0
Storage Blk Time (%)	1	1			0	0		11				
Queuing Penalty (veh)	2	2			0	1		7				

Intersection: 15: Bayview Drive & Mapleview Drive W

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	TR	L	T	T	R
Maximum Queue (m)	18.5	15.7	117.5	219.3	196.6	80.0
Average Queue (m)	4.1	5.2	111.7	169.9	49.6	42.2
95th Queue (m)	12.6	12.6	137.3	293.9	135.5	88.1
Link Distance (m)	218.2	218.2		214.5	214.5	
Upstream Blk Time (%)				30	0	
Queuing Penalty (veh)				147	0	
Storage Bay Dist (m)			110.0			45.0
Storage Blk Time (%)			68	5	1	11
Queuing Penalty (veh)			59	17	4	9

Intersection: 18: Bayview Drive & South Village Way/Barrie Molson Centre D/W

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	24.5	21.4	30.8	9.1	32.8	48.8	47.5	37.7	160.7	175.2
Average Queue (m)	9.6	8.0	7.1	2.0	10.7	13.7	15.5	5.1	96.1	92.4
95th Queue (m)	21.1	17.7	22.4	8.2	26.0	36.9	37.6	29.5	222.1	212.8
Link Distance (m)	126.0	126.0	60.2	60.2		214.5	214.5		195.2	195.2
Upstream Blk Time (%)									11	6
Queuing Penalty (veh)									56	29
Storage Bay Dist (m)					70.0			50.0		
Storage Blk Time (%)								0	42	
Queuing Penalty (veh)								0	3	

Intersection: 21: Bayview Drive & North Village Way/Private D/W

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	L	T	TR	L	T	TR
Maximum Queue (m)	25.3	41.7	8.8	20.9	37.4	35.1	6.3	148.7	155.8
Average Queue (m)	10.1	10.8	0.9	6.7	9.2	9.3	0.5	52.1	58.3
95th Queue (m)	21.4	30.3	5.2	16.3	28.7	26.2	3.7	164.1	168.6
Link Distance (m)		71.5	75.9		195.2	195.2		247.7	247.7
Upstream Blk Time (%)								2	2
Queuing Penalty (veh)								10	12
Storage Bay Dist (m)	25.0			70.0			70.0		
Storage Blk Time (%)	1							11	
Queuing Penalty (veh)	0							1	

Intersection: 24: Bayview Drive & Concert Way/Churchill Drive

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	19.2	14.0	22.3	39.9	35.0	39.8	43.2	43.9	96.0	102.9
Average Queue (m)	6.9	4.6	7.1	19.8	9.2	11.2	10.0	11.8	37.1	43.1
95th Queue (m)	16.9	12.0	17.5	33.2	25.7	29.0	28.3	36.5	104.2	109.9
Link Distance (m)				212.1		247.7	247.7		206.7	206.7
Upstream Blk Time (%)									1	1
Queuing Penalty (veh)									4	5
Storage Bay Dist (m)	50.0	50.0	30.0		70.0			65.0		
Storage Blk Time (%)			0	1				0	4	
Queuing Penalty (veh)			0	0				0	3	

Intersection: 28: Bayview Drive & Industrial Site D/W South/Coca-Cola D/W

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (m)	10.4	31.6	9.2	3.0	1.0	13.3	15.3	20.0
Average Queue (m)	2.5	6.7	1.0	0.1	0.0	1.8	1.0	1.2
95th Queue (m)	9.0	21.7	5.4	2.1	0.7	8.1	13.2	15.2
Link Distance (m)	149.4	182.1		206.7	206.7		206.3	206.3
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)			15.0			15.0		
Storage Blk Time (%)			0	0		0	1	
Queuing Penalty (veh)			0	0		0	0	

Intersection: 29: Bayview Drive & Medical Centre South D/W - Industrial Site D/W North

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	TR
Maximum Queue (m)	18.2	10.4	20.7	27.1	4.6	8.3
Average Queue (m)	7.0	4.6	11.2	1.2	0.2	0.6
95th Queue (m)	16.2	11.9	19.1	11.6	2.2	4.1
Link Distance (m)	102.1	102.1		206.3	137.8	137.8
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			15.0			
Storage Blk Time (%)			4			
Queuing Penalty (veh)			10			

Intersection: 31: Bayview Drive & Medical Centre North D/W

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (m)	14.5	12.1
Average Queue (m)	4.1	3.9
95th Queue (m)	11.9	11.6
Link Distance (m)	108.5	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		15.0
Storage Blk Time (%)		0
Queuing Penalty (veh)		1

Intersection: 33: Bayview Drive & Big Bay Point Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	TR	L
Maximum Queue (m)	69.8	115.5	119.5	75.0	92.4	121.2	90.3	73.8	45.4	68.8	59.8	28.7
Average Queue (m)	23.6	54.6	55.5	39.7	53.5	48.1	44.0	18.3	23.4	40.6	20.5	9.9
95th Queue (m)	49.6	86.7	90.6	73.4	86.0	85.4	74.3	43.0	41.9	65.7	48.3	22.2
Link Distance (m)		833.7	833.7			287.9	287.9			92.4	92.4	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	25.0			25.0	40.0			25.0	100.0			40.0
Storage Blk Time (%)	7	37	38	17	22	11	21	1				0
Queuing Penalty (veh)	23	50	154	55	69	42	49	4				0

Intersection: 33: Bayview Drive & Big Bay Point Road

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (m)	48.8	81.4	69.3
Average Queue (m)	26.5	19.8	35.8
95th Queue (m)	43.4	49.0	62.9
Link Distance (m)	101.3	101.3	
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		0	
Storage Bay Dist (m)			50.0
Storage Blk Time (%)	2	0	4
Queuing Penalty (veh)	1	0	5

Intersection: 39: Bryne Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	B38	NB	NB	NB
Directions Served	L	T	T	TR	L	T	T	TR	T	L	T	TR
Maximum Queue (m)	19.2	84.4	88.5	88.7	32.4	88.1	65.5	60.5	16.0	45.6	15.7	20.9
Average Queue (m)	6.5	47.9	58.8	52.4	31.2	51.6	34.2	32.9	0.7	21.7	3.2	5.8
95th Queue (m)	15.0	74.7	83.1	82.7	35.5	87.8	61.4	55.0	7.0	39.8	11.2	14.9
Link Distance (m)		286.7	286.7	286.7		66.0	66.0	66.0	86.5		103.6	103.6
Upstream Blk Time (%)						8	0	0				
Queuing Penalty (veh)						43	2	1				
Storage Bay Dist (m)	60.0				25.0					45.0		
Storage Blk Time (%)		2			43	2				1		
Queuing Penalty (veh)		1			174	9				0		

Intersection: 39: Bryne Drive & Mapleview Drive W

Movement	SB	SB	SB
Directions Served	L	T	TR
Maximum Queue (m)	26.6	40.9	35.0
Average Queue (m)	8.2	14.1	15.0
95th Queue (m)	20.2	29.4	26.8
Link Distance (m)		194.0	194.0
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)	50.0		
Storage Blk Time (%)		0	
Queuing Penalty (veh)		0	

Intersection: 43: Byrne Road/Bryne Road & Harvie Road/Big Bay Point Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	R
Maximum Queue (m)	10.3	67.3	61.4	9.1	36.1	46.5	51.2	28.8	12.9	25.2	12.0	21.0
Average Queue (m)	1.6	40.7	34.6	1.9	16.0	20.5	24.2	12.3	4.1	12.2	3.4	7.4
95th Queue (m)	7.4	63.2	57.6	7.9	31.2	39.3	42.2	23.9	11.1	23.7	10.1	15.9
Link Distance (m)		270.7	270.7			833.7	833.7			277.4	277.4	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	60.0			60.0	60.0			60.0	60.0			60.0
Storage Blk Time (%)		1	0			0	0					
Queuing Penalty (veh)		0	0			0	0					

Intersection: 43: Byrne Road/Bryne Road & Harvie Road/Big Bay Point Road

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (m)	46.6	43.6	41.0	15.3
Average Queue (m)	23.1	25.2	11.8	5.8
95th Queue (m)	40.2	40.1	26.4	13.0
Link Distance (m)		134.8	134.8	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)	60.0			60.0
Storage Blk Time (%)	0			
Queuing Penalty (veh)	0			

Network Summary

Network wide Queuing Penalty: 1174

Queues
210434

9: Highway 400 NB Off-Ramp & Mapleview Drive W
2031 Future Total - AM Peak Hour (Mitigation)

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	299	1790	1622	730	441	231
v/c Ratio	0.67	0.50	0.62	0.50	0.74	0.44
Control Delay	38.4	8.1	5.4	3.1	49.7	29.4
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	38.4	8.4	5.4	3.1	49.7	29.4
Queue Length 50th (m)	21.8	105.2	15.5	1.4	49.0	18.2
Queue Length 95th (m)	33.5	121.1	20.3	m44.1	62.4	29.8
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	499	3556	2601	1468	825	703
Starvation Cap Reductn	0	960	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	0.60	0.69	0.62	0.50	0.53	0.33

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
210434

9: Highway 400 NB Off-Ramp & Mapleview Drive W
2031 Future Total - AM Peak Hour (Mitigation)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	299	1790	0	0	1622	730	441	0	231	0	0	0
Future Volume (vph)	299	1790	0	0	1622	730	441	0	231	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0			6.0	4.0	6.0		6.0			
Lane Util. Factor	0.97	0.91			0.91	1.00	0.97		0.88			
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)	3213	5036			4893	1468	3242		2561			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3213	5036			4893	1468	3242		2561			
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)	299	1790	0	0	1622	730	441	0	231	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	56	0	0	0
Lane Group Flow (vph)	299	1790	0	0	1622	730	441	0	175	0	0	0
Heavy Vehicles (%)	9%	3%	0%	0%	6%	10%	8%	0%	11%	0%	0%	0%
Turn Type	Prot	NA			NA	Free	Prot		Perm			
Protected Phases	5	2			6		8					
Permitted Phases						Free			8			
Actuated Green, G (s)	15.2	77.7			58.5	110.0	20.3		20.3			
Effective Green, g (s)	15.2	77.7			58.5	110.0	20.3		20.3			
Actuated g/C Ratio	0.14	0.71			0.53	1.00	0.18		0.18			
Clearance Time (s)	4.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)	443	3557			2602	1468	598		472			
v/s Ratio Prot	c0.09	0.36			c0.33		c0.14					
v/s Ratio Perm						0.50			0.07			
v/c Ratio	0.67	0.50			0.62	0.50	0.74		0.37			
Uniform Delay, d1	45.1	7.4			18.0	0.0	42.3		39.3			
Progression Factor	0.73	0.98			0.24	1.00	1.00		1.00			
Incremental Delay, d2	3.0	0.4			0.7	0.8	4.7		0.5			
Delay (s)	35.7	7.6			5.1	0.8	47.1		39.7			
Level of Service	D	A			A	A	D		D			
Approach Delay (s)		11.6			3.7			44.6			0.0	
Approach LOS		B			A			D			A	

Intersection Summary

HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	75.9%	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)	321	1501	28	13	2004	90	171	39	27	10	178
v/c Ratio	0.50	0.44	0.03	0.05	0.85	0.12	0.48	0.20	0.22	0.08	0.32
Control Delay	60.1	3.7	0.0	3.8	14.4	0.2	51.0	24.2	52.1	48.5	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.1	3.7	0.0	3.8	14.6	0.2	51.0	24.2	52.1	48.5	5.8
Queue Length 50th (m)	38.6	10.9	0.0	0.4	47.9	0.1	19.2	2.5	5.9	2.2	0.0
Queue Length 95th (m)	54.8	32.1	m0.0	m0.6	m#185.2	m0.0	29.6	12.7	14.9	7.7	15.7
Internal Link Dist (m)		225.6			141.6			127.2		94.6	
Turn Bay Length (m)	160.0		175.0	50.0			50.0		60.0		
Base Capacity (vph)	636	3380	1059	278	2353	782	1103	555	125	132	556
Starvation Cap Reductn	0	0	0	0	44	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	0.50	0.44	0.03	0.05	0.87	0.12	0.16	0.07	0.22	0.08	0.32

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	321	1501	28	13	2004	90	171	12	27	27	10	178
Future Volume (vph)	321	1501	28	13	2004	90	171	12	27	27	10	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90		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)	3367	4893	1476	1805	4848	1475	3467	1687		1805	1900	1599
Flt Permitted	0.95	1.00	1.00	0.16	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3367	4893	1476	308	4848	1475	3467	1687		1805	1900	1599
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)	321	1501	28	13	2004	90	171	12	27	27	10	178
RTOR Reduction (vph)	0	0	10	0	0	48	0	24	0	0	0	136
Lane Group Flow (vph)	321	1501	18	13	2004	42	171	15	0	27	10	42
Confl. Peds. (#/hr)	2		1	1		2			1	1		
Heavy Vehicles (%)	4%	6%	8%	0%	7%	8%	1%	0%	0%	0%	0%	1%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases			2	6		6						4
Actuated Green, G (s)	20.8	70.4	70.4	52.4	51.0	51.0	11.3	11.3		4.9	4.9	25.7
Effective Green, g (s)	20.8	70.4	70.4	52.4	51.0	51.0	11.3	11.3		4.9	4.9	25.7
Actuated g/C Ratio	0.19	0.64	0.64	0.48	0.46	0.46	0.10	0.10		0.04	0.04	0.23
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0
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)	636	3131	944	165	2247	683	356	173		80	84	373
v/s Ratio Prot	c0.10	0.31		0.00	c0.41		c0.05	0.01		c0.01	0.01	0.02
v/s Ratio Perm			0.01	0.04		0.03						0.00
v/c Ratio	0.50	0.48	0.02	0.08	0.89	0.06	0.48	0.09		0.34	0.12	0.11
Uniform Delay, d1	40.0	10.3	7.2	15.2	27.0	16.3	46.6	44.7		51.0	50.5	33.2
Progression Factor	1.41	0.35	1.00	0.49	0.44	0.06	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	0.5	0.0	0.1	2.4	0.1	1.0	0.2		2.5	0.6	0.1
Delay (s)	56.8	4.1	7.2	7.5	14.3	1.1	47.6	44.9		53.5	51.1	33.3
Level of Service	E	A	A	A	B	A	D	D		D	D	C
Approach Delay (s)		13.3			13.7			47.1			36.7	
Approach LOS		B			B			D			D	

Intersection Summary

HCM 2000 Control Delay	16.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	73.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (m)	53.8	82.5	122.6	87.8	77.5	130.4	76.9	56.3	39.6	75.2	74.6	49.2
Average Queue (m)	24.0	25.6	21.9	15.8	18.8	46.3	22.4	25.6	4.3	42.2	38.9	24.4
95th Queue (m)	44.3	53.6	75.3	55.3	59.3	100.0	47.9	44.2	21.3	67.4	63.5	43.5
Link Distance (m)		168.4	168.4	168.4	168.4	218.3	218.3	218.3			335.8	335.8
Upstream Blk Time (%)		0	0									
Queuing Penalty (veh)		0	0									
Storage Bay Dist (m)	130.0								130.0	265.0		
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	NB
Directions Served	R
Maximum Queue (m)	38.2
Average Queue (m)	8.3
95th Queue (m)	22.5
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	265.0
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	L
Maximum Queue (m)	51.5	56.4	50.2	33.9	61.2	13.9	21.1	104.7	119.4	135.9	123.3	32.8
Average Queue (m)	32.8	37.9	24.5	20.1	32.7	2.1	3.1	52.6	55.0	79.6	14.5	10.9
95th Queue (m)	49.0	52.6	43.6	33.1	52.2	8.8	13.1	83.5	98.8	120.3	69.8	24.0
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)								0	0	0	0	
Queuing Penalty (veh)								0	0	2	2	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)								12				0
Queuing Penalty (veh)								2				0

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R
Maximum Queue (m)	49.3	21.7	21.1	9.4	46.2
Average Queue (m)	22.8	7.6	6.1	2.5	22.5
95th Queue (m)	39.5	17.6	14.7	8.0	39.7
Link Distance (m)	128.7	128.7		96.0	96.0
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)			60.0		
Storage Blk Time (%)	0				
Queuing Penalty (veh)	0				

Zone Summary

Zone wide Queuing Penalty: 6

Lane Group	WBT	NET
Lane Group Flow (vph)	1646	1435
v/c Ratio	0.65	0.75
Control Delay	10.7	31.8
Queue Delay	0.2	0.0
Total Delay	10.8	31.8
Queue Length 50th (m)	34.5	95.4
Queue Length 95th (m)	41.1	105.0
Internal Link Dist (m)	43.5	23.7
Turn Bay Length (m)		
Base Capacity (vph)	2535	2134
Starvation Cap Reductn	204	0
Spillback Cap Reductn	126	4
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.71	0.67

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	1646	0	0	1435	0	0	0	0
Future Volume (vph)	0	0	0	0	1646	0	0	1435	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0			6.0				
Lane Util. Factor					0.91			0.91				
Frt					1.00			1.00				
Flt Protected					1.00			1.00				
Satd. Flow (prot)					4995			4995				
Flt Permitted					1.00			1.00				
Satd. Flow (perm)					4995			4995				
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	0	1646	0	0	1435	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1646	0	0	1435	0	0	0	0
Heavy Vehicles (%)	0%	0%	0%	0%	5%	0%	0%	5%	0%	0%	0%	0%
Turn Type					NA			NA				
Protected Phases					6			8				
Permitted Phases												
Actuated Green, G (s)					55.8			42.2				
Effective Green, g (s)					55.8			42.2				
Actuated g/C Ratio					0.51			0.38				
Clearance Time (s)					6.0			6.0				
Vehicle Extension (s)					3.0			3.0				
Lane Grp Cap (vph)					2533			1916				
v/s Ratio Prot					c0.33			c0.29				
v/s Ratio Perm												
v/c Ratio					0.65			0.75				
Uniform Delay, d1					19.9			29.3				
Progression Factor					0.47			1.00				
Incremental Delay, d2					1.0			1.6				
Delay (s)					10.3			31.0				
Level of Service					B			C				
Approach Delay (s)		0.0			10.3			31.0			0.0	
Approach LOS		A			B			C			A	

Intersection Summary

HCM 2000 Control Delay	19.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	SBL
Lane Group Flow (vph)	1435	654
v/c Ratio	0.66	0.41
Control Delay	1.3	20.6
Queue Delay	0.2	0.0
Total Delay	1.5	20.6
Queue Length 50th (m)	0.0	46.7
Queue Length 95th (m)	0.0	61.0
Internal Link Dist (m)	41.3	34.0
Turn Bay Length (m)		
Base Capacity (vph)	2179	1578
Starvation Cap Reductn	180	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.72	0.41

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1435	0	0	654	0
Future Volume (vph)	0	1435	0	0	654	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			6.0	
Lane Util. Factor		0.91			0.97	
Frt		1.00			1.00	
Flt Protected		1.00			0.95	
Satd. Flow (prot)		4995			3404	
Flt Permitted		1.00			0.95	
Satd. Flow (perm)		4995			3404	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1435	0	0	654	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1435	0	0	654	0
Heavy Vehicles (%)	0%	5%	0%	0%	4%	0%
Turn Type		NA			Prot	
Protected Phases		4			6	
Permitted Phases						
Actuated Green, G (s)		48.0			51.0	
Effective Green, g (s)		48.0			51.0	
Actuated g/C Ratio		0.44			0.46	
Clearance Time (s)		5.0			6.0	
Vehicle Extension (s)		3.0			3.0	
Lane Grp Cap (vph)		2179			1578	
v/s Ratio Prot		c0.29			c0.19	
v/s Ratio Perm						
v/c Ratio		0.66			0.41	
Uniform Delay, d1		24.5			19.6	
Progression Factor		0.00			1.00	
Incremental Delay, d2		1.2			0.8	
Delay (s)		1.3			20.4	
Level of Service		A			C	
Approach Delay (s)		1.3	0.0		20.4	
Approach LOS		A	A		C	

Intersection Summary

HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	SWT
Lane Group Flow (vph)	1790	1622
v/c Ratio	0.83	0.71
Control Delay	19.9	26.1
Queue Delay	0.4	0.0
Total Delay	20.3	26.1
Queue Length 50th (m)	64.9	100.6
Queue Length 95th (m)	73.6	122.6
Internal Link Dist (m)	50.1	8.2
Turn Bay Length (m)		
Base Capacity (vph)	2314	2300
Starvation Cap Reductn	154	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.83	0.71

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	1790	0	0	0	0	0	0	0	0	1622	0
Future Volume (vph)	0	1790	0	0	0	0	0	0	0	0	1622	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0									6.0	
Lane Util. Factor		0.91									0.91	
Frt		1.00									1.00	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		5092									4948	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		5092									4948	
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	1790	0	0	0	0	0	0	0	0	1622	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1790	0	0	0	0	0	0	0	0	1622	0
Heavy Vehicles (%)	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	6%	0%
Turn Type		NA									NA	
Protected Phases		4									2	
Permitted Phases												
Actuated Green, G (s)		46.9									51.1	
Effective Green, g (s)		46.9									51.1	
Actuated g/C Ratio		0.43									0.46	
Clearance Time (s)		6.0									6.0	
Vehicle Extension (s)		3.0									3.0	
Lane Grp Cap (vph)		2171									2298	
v/s Ratio Prot		c0.35									c0.33	
v/s Ratio Perm												
v/c Ratio		0.82									0.71	
Uniform Delay, d1		27.9									23.5	
Progression Factor		0.60									1.00	
Incremental Delay, d2		2.2									1.9	
Delay (s)		19.0									25.3	
Level of Service		B									C	
Approach Delay (s)		19.0			0.0			0.0			25.3	
Approach LOS		B			A			A			C	

Intersection Summary

HCM 2000 Control Delay	22.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Traffic Volume (veh/h)	0	0	417	1646	0	0
Future Volume (Veh/h)	0	0	417	1646	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	417	1646	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	67			77		
pX, platoon unblocked					0.73	
vC, conflicting volume			0		1383	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		206	0
tC, single (s)			4.3		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			73		100	100
cM capacity (veh/h)			1558		409	1091

Direction, Lane #	WB 1	WB 2	WB 3
Volume Total	746	658	658
Volume Left	417	0	0
Volume Right	0	0	0
cSH	1558	1700	1700
Volume to Capacity	0.27	0.39	0.39
Queue Length 95th (m)	8.3	0.0	0.0
Control Delay (s)	5.7	0.0	0.0
Lane LOS	A		
Approach Delay (s)	2.1		
Approach LOS			

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1435	188	0	0	0	0
Future Volume (Veh/h)	1435	188	0	0	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1435	188	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				48		
pX, platoon unblocked						
vC, conflicting volume			1623		1435	478
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1623		1435	478
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			406		127	539

Direction, Lane #	EB 1	EB 2	EB 3	EB 4
Volume Total	478	478	478	188
Volume Left	0	0	0	0
Volume Right	0	0	0	188
cSH	1700	1700	1700	1700
Volume to Capacity	0.28	0.28	0.28	0.11
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0			
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	WBT	SBR
Lane Group Flow (vph)	1646	688
v/c Ratio	0.71	0.58
Control Delay	2.6	25.8
Queue Delay	0.0	0.0
Total Delay	2.6	25.8
Queue Length 50th (m)	0.1	61.1
Queue Length 95th (m)	0.2	81.3
Internal Link Dist (m)	10.7	
Turn Bay Length (m)		
Base Capacity (vph)	2315	1188
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.71	0.58

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	1646	0	0	688
Future Volume (vph)	0	0	1646	0	0	688
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			6.0			6.0
Lane Util. Factor			0.91			0.88
Frt			1.00			0.85
Flt Protected			1.00			1.00
Satd. Flow (prot)			4995			2763
Flt Permitted			1.00			1.00
Satd. Flow (perm)			4995			2763
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	1646	0	0	688
RTOR Reduction (vph)	0	0	0	0	0	8
Lane Group Flow (vph)	0	0	1646	0	0	680
Heavy Vehicles (%)	0%	0%	5%	0%	0%	4%
Turn Type			NA			Prot
Protected Phases			2			8
Permitted Phases						
Actuated Green, G (s)			51.0			47.0
Effective Green, g (s)			51.0			47.0
Actuated g/C Ratio			0.46			0.43
Clearance Time (s)			6.0			6.0
Lane Grp Cap (vph)			2315			1180
v/s Ratio Prot			c0.33			c0.25
v/s Ratio Perm						
v/c Ratio			0.71			0.58
Uniform Delay, d1			23.6			23.9
Progression Factor			0.05			1.00
Incremental Delay, d2			1.4			2.1
Delay (s)			2.6			26.0
Level of Service			A			C
Approach Delay (s)		0.0	2.6		26.0	
Approach LOS		A	A		C	

Intersection Summary

HCM 2000 Control Delay	9.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (veh/h)	0	0	1622	730	0	0
Future Volume (Veh/h)	0	0	1622	730	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	1622	730	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		32				
pX, platoon unblocked						
vC, conflicting volume	2352				1622	541
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2352				1622	541
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	212				95	491

Direction, Lane #	WB 1	WB 2	WB 3	WB 4
Volume Total	541	541	541	730
Volume Left	0	0	0	0
Volume Right	0	0	0	730
cSH	1700	1700	1700	1700
Volume to Capacity	0.32	0.32	0.32	0.43
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0			
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBT	NBR
Lane Group Flow (vph)	1790	233
v/c Ratio	0.75	0.20
Control Delay	1.4	18.0
Queue Delay	0.1	0.0
Total Delay	1.5	18.0
Queue Length 50th (m)	0.0	15.9
Queue Length 95th (m)	0.0	24.6
Internal Link Dist (m)	26.5	
Turn Bay Length (m)		
Base Capacity (vph)	2383	1170
Starvation Cap Reductn	87	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.78	0.20

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1790	0	0	0	0	233
Future Volume (vph)	1790	0	0	0	0	233
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5					4.5
Lane Util. Factor	0.91					0.88
Frt	1.00					0.85
Flt Protected	1.00					1.00
Satd. Flow (prot)	5092					2589
Flt Permitted	1.00					1.00
Satd. Flow (perm)	5092					2589
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1790	0	0	0	0	233
RTOR Reduction (vph)	0	0	0	0	0	6
Lane Group Flow (vph)	1790	0	0	0	0	228
Heavy Vehicles (%)	3%	0%	0%	0%	0%	11%
Turn Type	NA					Perm
Protected Phases	4					
Permitted Phases						2
Actuated Green, G (s)	51.5					49.5
Effective Green, g (s)	51.5					49.5
Actuated g/C Ratio	0.47					0.45
Clearance Time (s)	4.5					4.5
Lane Grp Cap (vph)	2383					1165
v/s Ratio Prot	c0.35					
v/s Ratio Perm						c0.09
v/c Ratio	0.75					0.20
Uniform Delay, d1	24.0					18.2
Progression Factor	0.00					1.00
Incremental Delay, d2	1.4					0.4
Delay (s)	1.4					18.6
Level of Service	A					B
Approach Delay (s)	1.4			0.0	18.6	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	3.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Traffic Volume (veh/h)	299	1790	0	0	0	0
Future Volume (Veh/h)	299	1790	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	299	1790	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		75	74			
pX, platoon unblocked					0.78	
vC, conflicting volume	0				1195	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				253	0
tC, single (s)	4.3				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	81				100	100
cM capacity (veh/h)	1572				454	1091

Direction, Lane #	EB 1	EB 2	EB 3
Volume Total	657	716	716
Volume Left	299	0	0
Volume Right	0	0	0
cSH	1572	1700	1700
Volume to Capacity	0.19	0.42	0.42
Queue Length 95th (m)	5.3	0.0	0.0
Control Delay (s)	4.6	0.0	0.0
Lane LOS	A		
Approach Delay (s)	1.4		
Approach LOS			

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	92.5%	ICU Level of Service	F
Analysis Period (min)	15		

Lane Group	WBT	NBL
Lane Group Flow (vph)	1622	441
v/c Ratio	0.75	0.30
Control Delay	4.9	19.6
Queue Delay	0.0	0.0
Total Delay	4.9	19.6
Queue Length 50th (m)	5.0	29.9
Queue Length 95th (m)	5.5	40.9
Internal Link Dist (m)	42.1	32.8
Turn Bay Length (m)		
Base Capacity (vph)	2159	1490
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.75	0.30

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1622	441	0
Future Volume (vph)	0	0	0	1622	441	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.0	6.0	
Lane Util. Factor				0.91	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				4948	3278	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				4948	3278	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	1622	441	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	1622	441	0
Heavy Vehicles (%)	0%	0%	0%	6%	8%	0%
Turn Type				NA	Prot	
Protected Phases				8	2	
Permitted Phases						
Actuated Green, G (s)				48.0	50.0	
Effective Green, g (s)				48.0	50.0	
Actuated g/C Ratio				0.44	0.45	
Clearance Time (s)				6.0	6.0	
Vehicle Extension (s)				3.0	3.0	
Lane Grp Cap (vph)				2159	1490	
v/s Ratio Prot				c0.33	c0.13	
v/s Ratio Perm						
v/c Ratio				0.75	0.30	
Uniform Delay, d1				26.0	18.9	
Progression Factor				0.12	1.00	
Incremental Delay, d2				1.7	0.5	
Delay (s)				4.9	19.4	
Level of Service				A	B	
Approach Delay (s)	0.0			4.9	19.4	
Approach LOS	A			A	B	

Intersection Summary

HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 1: West Terminal-E-S

Movement	WB	WB	WB	NE	NE	NE
Directions Served	T	T	T	T	T	T
Maximum Queue (m)	52.2	49.5	49.9	32.7	30.0	26.7
Average Queue (m)	38.6	39.2	29.1	24.8	23.4	18.3
95th Queue (m)	52.1	52.1	47.6	29.7	26.4	29.6
Link Distance (m)	18.6	18.6	18.6	22.8	22.8	22.8
Upstream Blk Time (%)	36	44	31	51	36	10
Queuing Penalty (veh)	198	242	168	243	172	50
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: W-N & N-E

Movement	EB	EB	EB	SB	SB
Directions Served	T	T	T	L	L
Maximum Queue (m)	19.2	9.3	7.4	66.8	53.1
Average Queue (m)	9.2	1.4	0.3	50.1	33.4
95th Queue (m)	17.9	6.2	3.3	67.5	51.1
Link Distance (m)	22.8	22.8	22.8	37.0	37.0
Upstream Blk Time (%)	1			19	5
Queuing Penalty (veh)	3			61	16
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: East Terminal

Movement	EB	EB	EB	SW	SW	SW
Directions Served	T	T	T	T	T	T
Maximum Queue (m)	65.8	66.4	60.0	46.4	45.3	39.6
Average Queue (m)	58.4	56.1	47.9	36.9	37.3	25.7
95th Queue (m)	62.5	64.0	63.7	41.8	41.7	43.6
Link Distance (m)	27.3	27.3	27.3	19.8	19.8	19.8
Upstream Blk Time (%)	40	43	33	55	42	16
Queuing Penalty (veh)	239	259	200	298	228	87
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: West Terminal-E-S

Movement	WB	WB	WB
Directions Served	LT	T	T
Maximum Queue (m)	52.2	42.0	15.1
Average Queue (m)	17.1	8.1	1.3
95th Queue (m)	43.0	28.9	7.8
Link Distance (m)	59.5	59.5	59.5
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	1		
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: W-S

Movement	EB	EB	EB
Directions Served	T	T	T
Maximum Queue (m)	166.8	142.2	92.2
Average Queue (m)	110.4	92.5	38.0
95th Queue (m)	152.1	136.3	85.8
Link Distance (m)	183.8	183.8	183.8
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: N-W

Movement	WB	WB	WB	SB	SB
Directions Served	T	T	T	R	R
Maximum Queue (m)	8.7	13.7	14.7	65.1	60.5
Average Queue (m)	0.9	4.0	2.9	53.7	37.8
95th Queue (m)	5.4	11.3	10.8	66.6	54.1
Link Distance (m)	7.7	7.7	7.7	37.2	37.2
Upstream Blk Time (%)	3	18	11	24	7
Queuing Penalty (veh)	18	97	59	84	26
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 12: E-N

Movement	WB	WB	WB
Directions Served	T	T	T
Maximum Queue (m)	179.8	151.0	102.5
Average Queue (m)	119.4	100.1	38.2
95th Queue (m)	168.1	147.2	91.8
Link Distance (m)	187.5	187.5	187.5
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 14: S-E

Movement	EB	EB	EB	NB	NB
Directions Served	T	T	T	R	R
Maximum Queue (m)	2.9	8.6	10.1	58.0	47.3
Average Queue (m)	0.1	1.1	1.4	25.8	13.3
95th Queue (m)	1.5	5.4	6.4	46.7	35.9
Link Distance (m)	20.9	20.9	20.9	48.7	48.7
Upstream Blk Time (%)			0	1	0
Queuing Penalty (veh)			0	1	0
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 16: W-N/East Terminal

Movement	EB	EB	EB
Directions Served	LT	T	T
Maximum Queue (m)	53.5	47.5	32.8
Average Queue (m)	27.4	18.7	5.3
95th Queue (m)	48.4	42.6	22.0
Link Distance (m)	54.6	54.6	54.6
Upstream Blk Time (%)	0	0	0
Queuing Penalty (veh)	3	1	0
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 17: S-W

Movement	WB	WB	WB	NB	NB
Directions Served	T	T	T	L	L
Maximum Queue (m)	39.0	38.9	31.4	66.2	44.7
Average Queue (m)	25.1	20.2	11.6	43.9	26.4
95th Queue (m)	35.9	33.7	28.2	64.8	47.8
Link Distance (m)	31.8	31.8	31.8	39.6	39.6
Upstream Blk Time (%)	4	1	0	10	1
Queuing Penalty (veh)	24	7	1	23	2
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 2810

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	49	1543	376	1740	57	90	421	303	40
v/c Ratio	0.29	0.55	0.76	0.64	0.19	0.34	0.89	0.72	0.05
Control Delay	16.0	19.3	75.6	9.8	31.2	50.8	38.0	46.4	19.4
Queue Delay	0.0	0.5	0.0	0.1	0.0	0.0	0.6	0.0	0.0
Total Delay	16.0	19.7	75.6	9.9	31.2	50.8	38.6	46.4	19.4
Queue Length 50th (m)	3.4	49.9	43.4	80.5	10.9	22.2	36.8	67.9	2.0
Queue Length 95th (m)	11.1	66.8	59.8	167.7	18.8	35.3	73.3	84.9	6.3
Internal Link Dist (m)		85.2		118.2		85.0			175.8
Turn Bay Length (m)	70.0		65.0		20.0			40.0	
Base Capacity (vph)	172	2785	543	2722	295	438	586	422	1043
Starvation Cap Reductn	0	0	0	185	0	0	0	0	0
Spillback Cap Reductn	0	675	0	0	0	0	30	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.73	0.69	0.69	0.19	0.21	0.76	0.72	0.04

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	1501	42	376	1492	248	57	90	421	303	18	22
Future Volume (vph)	49	1501	42	376	1492	248	57	90	421	303	18	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0	6.0	4.0	6.0	
Lane Util. Factor	1.00	0.86		0.97	0.91		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.99	1.00	
Frt	1.00	1.00		1.00	0.98		1.00	1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	6319		3502	4951		1805	1900	1575	1777	3312	
Flt Permitted	0.09	1.00		0.95	1.00		0.73	1.00	1.00	0.58	1.00	
Satd. Flow (perm)	179	6319		3502	4951		1386	1900	1575	1082	3312	
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	1501	42	376	1492	248	57	90	421	303	18	22
RTOR Reduction (vph)	0	2	0	0	15	0	0	0	247	0	17	0
Lane Group Flow (vph)	49	1541	0	376	1725	0	57	90	174	303	23	0
Confl. Peds. (#/hr)	7		1	1		7			6	6		
Heavy Vehicles (%)	0%	3%	2%	0%	2%	3%	0%	0%	0%	1%	0%	0%
Turn Type	pm+pt	NA		Prot	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2						8		8	4		
Actuated Green, G (s)	61.8	56.5		18.3	69.5		23.7	19.2	19.2	39.2	30.7	
Effective Green, g (s)	61.8	56.5		18.3	69.5		23.7	19.2	19.2	39.2	30.7	
Actuated g/C Ratio	0.48	0.43		0.14	0.53		0.18	0.15	0.15	0.30	0.24	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0	6.0	4.0	6.0	
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)	151	2746		492	2646		267	280	232	411	782	
v/s Ratio Prot	0.01	0.24		c0.11	c0.35		0.01	0.05		c0.09	0.01	
v/s Ratio Perm	0.14						0.03		0.11	c0.13		
v/c Ratio	0.32	0.56		0.76	0.65		0.21	0.32	0.75	0.74	0.03	
Uniform Delay, d1	19.4	27.5		53.8	21.6		44.9	49.6	53.1	38.9	38.2	
Progression Factor	0.89	0.65		1.24	0.39		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.1	0.8		6.1	1.1		0.4	0.7	12.4	6.8	0.0	
Delay (s)	18.4	18.5		72.5	9.6		45.3	50.2	65.5	45.7	38.2	
Level of Service	B	B		E	A		D	D	E	D	D	
Approach Delay (s)		18.5			20.8			61.1			44.8	
Approach LOS		B			C			E			D	

Intersection Summary

HCM 2000 Control Delay	26.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	2043	180	449	1852	649	264
v/c Ratio	0.80	0.27	0.93	0.53	0.83	0.39
Control Delay	25.8	5.6	42.2	10.8	57.2	33.3
Queue Delay	0.1	0.0	0.0	0.6	0.6	0.0
Total Delay	25.9	5.6	42.2	11.4	57.7	33.3
Queue Length 50th (m)	156.5	4.3	88.0	132.2	85.6	26.1
Queue Length 95th (m)	103.8	m9.5	#167.3	168.3	104.0	39.1
Internal Link Dist (m)	118.2			168.8		
Turn Bay Length (m)		45.0	135.0		300.0	300.0
Base Capacity (vph)	2560	672	500	3469	906	778
Starvation Cap Reductn	65	0	0	1075	0	0
Spillback Cap Reductn	12	0	0	273	60	2
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.27	0.90	0.77	0.77	0.34

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)	0	2043	180	449	1852	0	0	0	0	649	0	264
Future Volume (vph)	0	2043	180	449	1852	0	0	0	0	649	0	264
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	4.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	1.00	0.91					0.97		0.88
Frpb, ped/bikes		1.00	1.00	1.00	1.00					1.00		1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		6408	1553	1736	5136					3367		2733
Flt Permitted		1.00	1.00	0.07	1.00					0.95		1.00
Satd. Flow (perm)		6408	1553	131	5136					3367		2733
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	2043	180	449	1852	0	0	0	0	649	0	264
RTOR Reduction (vph)	0	0	52	0	0	0	0	0	0	0	0	45
Lane Group Flow (vph)	0	2043	128	449	1852	0	0	0	0	649	0	219
Confl. Peds. (#/hr)	4					4						
Heavy Vehicles (%)	0%	2%	4%	4%	1%	0%	0%	0%	0%	4%	0%	4%
Turn Type		NA	Perm	pm+pt	NA					Prot		Perm
Protected Phases		2		1	6					4		
Permitted Phases			2	6								4
Actuated Green, G (s)		51.9	51.9	87.8	87.8					30.2		30.2
Effective Green, g (s)		51.9	51.9	87.8	87.8					30.2		30.2
Actuated g/C Ratio		0.40	0.40	0.68	0.68					0.23		0.23
Clearance Time (s)		6.0	6.0	4.0	6.0					6.0		6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		3.0
Lane Grp Cap (vph)		2558	620	482	3468					782		634
v/s Ratio Prot		0.32		c0.23	0.36					c0.19		
v/s Ratio Perm			0.08	c0.40								0.08
v/c Ratio		0.80	0.21	0.93	0.53					0.83		0.34
Uniform Delay, d1		34.4	25.6	39.5	10.7					47.5		41.6
Progression Factor		0.66	0.32	0.58	0.93					1.00		1.00
Incremental Delay, d2		2.2	0.6	18.5	0.4					7.3		0.3
Delay (s)		24.9	8.9	41.4	10.3					54.8		42.0
Level of Service		C	A	D	B					D		D
Approach Delay (s)		23.6			16.4			0.0			51.1	
Approach LOS		C			B			A			D	

Intersection Summary

HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	108.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	650	2042	1830	1027	471	559
v/c Ratio	0.95	0.58	0.77	0.98	0.66	0.91
Control Delay	52.9	15.4	20.5	20.4	52.2	65.1
Queue Delay	0.0	2.4	0.0	16.7	0.0	0.0
Total Delay	52.9	17.8	20.5	37.2	52.2	65.1
Queue Length 50th (m)	82.2	164.0	73.7	55.7	60.1	75.6
Queue Length 95th (m)	#123.8	180.0	m69.3	m48.8	78.8	#110.6
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	686	3526	2388	1046	739	634
Starvation Cap Reductn	0	1308	0	61	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.92	0.77	1.04	0.64	0.88

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)	650	2042	0	0	1830	1027	471	0	559	0	0	0
Future Volume (vph)	650	2042	0	0	1830	1027	471	0	559	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0			6.0	6.0	6.0		6.0			
Lane Util. Factor	0.97	0.91			0.91	1.00	0.97		0.88			
Frpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00			
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)	3433	5036			5085	1583	3433		2733			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3433	5036			5085	1583	3433		2733			
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)	650	2042	0	0	1830	1027	471	0	559	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	303	0	0	47	0	0	0
Lane Group Flow (vph)	650	2042	0	0	1830	724	471	0	512	0	0	0
Confl. Peds. (#/hr)			3	3								
Heavy Vehicles (%)	2%	3%	0%	0%	2%	2%	2%	0%	4%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Prot		Perm			
Protected Phases	5	2			6		8					
Permitted Phases						6			8			
Actuated Green, G (s)	25.9	91.0			61.1	61.1	27.0		27.0			
Effective Green, g (s)	25.9	91.0			61.1	61.1	27.0		27.0			
Actuated g/C Ratio	0.20	0.70			0.47	0.47	0.21		0.21			
Clearance Time (s)	4.0	6.0			6.0	6.0	6.0		6.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0			
Lane Grp Cap (vph)	683	3525			2389	744	713		567			
v/s Ratio Prot	c0.19	0.41			0.36		0.14					
v/s Ratio Perm						c0.46			c0.19			
v/c Ratio	0.95	0.58			0.77	0.97	0.66		0.90			
Uniform Delay, d1	51.4	9.8			28.5	33.6	47.3		50.2			
Progression Factor	0.68	1.49			0.70	0.97	1.00		1.00			
Incremental Delay, d2	16.4	0.4			0.2	5.4	2.3		17.7			
Delay (s)	51.2	15.1			20.1	38.0	49.6		68.0			
Level of Service	D	B			C	D	D		E			
Approach Delay (s)		23.8			26.5			59.6			0.0	
Approach LOS		C			C			E			A	

Intersection Summary

HCM 2000 Control Delay	30.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
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	SBL	SBT	SBR
Lane Group Flow (vph)	417	1814	67	69	1707	256	659	90	227	50	492
v/c Ratio	1.19	0.98	0.10	0.43	1.07	0.42	0.83	0.21	0.68	0.14	1.19
Control Delay	162.2	34.5	0.4	26.9	71.7	5.6	56.7	33.6	61.8	48.0	138.0
Queue Delay	0.0	0.0	0.0	0.0	10.5	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	162.2	34.5	0.4	26.9	82.2	5.6	56.7	33.6	61.8	48.0	138.0
Queue Length 50th (m)	~68.2	~191.0	0.2	6.4	~181.5	3.7	87.0	16.2	58.1	11.5	~128.5
Queue Length 95th (m)	m#99.2	#218.5	m0.4	m8.0	#212.6	m6.4	104.7	30.1	#105.9	24.6	#211.8
Internal Link Dist (m)		225.6			141.6			127.2		94.6	
Turn Bay Length (m)	160.0		175.0	50.0			50.0		60.0		
Base Capacity (vph)	350	1856	660	163	1588	606	933	492	334	351	415
Starvation Cap Reductn	0	0	0	0	45	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	1.19	0.98	0.10	0.42	1.11	0.42	0.71	0.18	0.68	0.14	1.19

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.
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)	417	1814	67	69	1707	256	659	65	25	227	50	492
Future Volume (vph)	417	1814	67	69	1707	256	659	65	25	227	50	492
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		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)	3502	4940	1578	1787	5036	1529	3467	1788		1805	1900	1615
Flt Permitted	0.95	1.00	1.00	0.10	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	4940	1578	184	5036	1529	3467	1788		1805	1900	1615
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)	417	1814	67	69	1707	256	659	65	25	227	50	492
RTOR Reduction (vph)	0	0	42	0	0	125	0	12	0	0	0	116
Lane Group Flow (vph)	417	1814	25	69	1707	131	659	78	0	227	50	376
Confl. Peds. (#/hr)	3		1	1		3			2	2		
Heavy Vehicles (%)	0%	5%	1%	1%	3%	4%	1%	2%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2	6		6						4
Actuated Green, G (s)	13.0	48.0	48.0	47.0	41.0	41.0	29.9	29.9		24.1	24.1	24.1
Effective Green, g (s)	13.0	48.0	48.0	47.0	41.0	41.0	29.9	29.9		24.1	24.1	24.1
Actuated g/C Ratio	0.10	0.37	0.37	0.36	0.32	0.32	0.23	0.23		0.19	0.19	0.19
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	350	1824	582	140	1588	482	797	411		334	352	299
v/s Ratio Prot	c0.12	0.37		0.02	c0.34		c0.19	0.04		0.13	0.03	
v/s Ratio Perm			0.02	0.16		0.09						c0.23
v/c Ratio	1.19	0.99	0.04	0.49	1.07	0.27	0.83	0.19		0.68	0.14	1.26
Uniform Delay, d1	58.5	40.9	26.3	32.5	44.5	33.3	47.6	40.3		49.4	44.3	53.0
Progression Factor	1.18	0.47	0.18	1.11	0.71	0.43	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	106.0	17.1	0.1	1.3	40.2	0.7	7.0	0.2		5.4	0.2	139.5
Delay (s)	174.9	36.3	4.9	37.6	71.8	15.0	54.6	40.5		54.8	44.5	192.5
Level of Service	F	D	A	D	E	B	D	D		D	D	F
Approach Delay (s)		60.5			63.4			52.9			142.2	
Approach LOS		E			E			D			F	

Intersection Summary

HCM 2000 Control Delay	71.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	22.0
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	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	578	1352	137	52	1454	217	299	345	168	579
v/c Ratio	0.90	0.53	0.18	0.24	0.86	0.87	0.48	0.91	0.20	0.94
Control Delay	76.0	21.1	6.1	18.8	46.6	90.7	40.1	62.5	38.6	45.2
Queue Delay	0.0	0.1	0.0	0.0	11.0	0.0	0.0	0.0	0.0	0.9
Total Delay	76.0	21.3	6.1	18.8	57.5	90.7	40.1	62.5	38.6	46.1
Queue Length 50th (m)	85.5	62.8	6.0	6.3	140.6	30.4	29.9	71.0	18.3	72.5
Queue Length 95th (m)	m88.6	m65.3	m7.0	13.2	#176.3	#53.6	43.5	#114.1	27.5	#141.2
Internal Link Dist (m)		141.6			238.0		219.7		226.0	
Turn Bay Length (m)	70.0		50.0	120.0		95.0		110.0		45.0
Base Capacity (vph)	647	2528	742	219	1683	250	781	380	1017	669
Starvation Cap Reductn	0	303	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	229	0	0	0	0	15
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.61	0.18	0.24	1.00	0.87	0.38	0.91	0.17	0.89

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)	578	1352	137	52	1237	217	217	203	96	345	168	579
Future Volume (vph)	578	1352	137	52	1237	217	217	203	96	345	168	579
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3303	5085	1367	1703	4862		3467	3309		1686	3574	1524
Flt Permitted	0.95	1.00	1.00	0.19	1.00		0.95	1.00		0.39	1.00	1.00
Satd. Flow (perm)	3303	5085	1367	340	4862		3467	3309		700	3574	1524
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)	578	1352	137	52	1237	217	217	203	96	345	168	579
RTOR Reduction (vph)	0	0	64	0	18	0	0	46	0	0	0	252
Lane Group Flow (vph)	578	1352	73	52	1436	0	217	253	0	345	168	327
Confl. Peds. (#/hr)	1		4	4		1			1	1		
Heavy Vehicles (%)	6%	2%	16%	6%	2%	16%	1%	5%	0%	7%	1%	6%
Turn Type	Prot	NA	Perm	pm+pt	NA		Prot	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)	25.2	63.8	63.8	50.4	44.5		9.4	22.9		44.3	30.9	30.9
Effective Green, g (s)	25.2	63.8	63.8	50.4	44.5		9.4	22.9		44.3	30.9	30.9
Actuated g/C Ratio	0.19	0.49	0.49	0.39	0.34		0.07	0.18		0.34	0.24	0.24
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
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)	640	2495	670	193	1664		250	582		370	849	362
v/s Ratio Prot	c0.17	0.27		0.01	c0.30		0.06	0.08		c0.12	0.05	
v/s Ratio Perm			0.05	0.09						c0.19		0.21
v/c Ratio	0.90	0.54	0.11	0.27	0.86		0.87	0.43		0.93	0.20	0.90
Uniform Delay, d1	51.2	23.0	17.8	25.1	39.9		59.7	47.8		38.0	39.6	48.1
Progression Factor	1.35	0.86	1.28	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.7	0.3	0.1	0.8	6.2		25.7	0.5		30.0	0.1	25.0
Delay (s)	75.6	20.0	22.8	25.9	46.1		85.3	48.3		68.0	39.8	73.1
Level of Service	E	B	C	C	D		F	D		E	D	E
Approach Delay (s)		35.7			45.4			63.9			66.4	
Approach LOS		D			D			E			E	

Intersection Summary

HCM 2000 Control Delay	47.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	90.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	278	27	16	103	894	12	1083
v/c Ratio	0.64	0.16	0.05	0.31	0.38	0.02	0.54
Control Delay	30.5	34.0	15.8	8.1	9.3	6.2	14.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.5	34.0	15.8	8.1	9.3	6.2	14.5
Queue Length 50th (m)	16.5	4.7	0.2	6.5	40.4	0.7	72.4
Queue Length 95th (m)	30.8	12.1	5.9	14.2	80.3	2.9	102.8
Internal Link Dist (m)	115.4		50.9		226.0		199.1
Turn Bay Length (m)				70.0		50.0	
Base Capacity (vph)	752	168	412	331	2338	485	2018
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.16	0.04	0.31	0.38	0.02	0.54

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	149	1	128	27	1	15	103	867	27	12	936	147
Future Volume (vph)	149	1	128	27	1	15	103	867	27	12	936	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor		0.95		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.93		1.00	0.86		1.00	1.00		1.00	0.98	
Flt Protected		0.97		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3243		1442	1633		1656	3426		1805	3378	
Flt Permitted		0.81		0.35	1.00		0.19	1.00		0.31	1.00	
Satd. Flow (perm)		2691		534	1633		339	3426		590	3378	
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)	149	1	128	27	1	15	103	867	27	12	936	147
RTOR Reduction (vph)	0	113	0	0	12	0	0	1	0	0	8	0
Lane Group Flow (vph)	0	165	0	27	4	0	103	893	0	12	1075	0
Confl. Peds. (#/hr)			6	6			7		2	2		7
Heavy Vehicles (%)	0%	0%	0%	25%	0%	0%	9%	5%	0%	0%	5%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		12.4		20.4	20.4		75.7	70.4		66.0	64.7	
Effective Green, g (s)		12.4		20.4	20.4		75.7	70.4		66.0	64.7	
Actuated g/C Ratio		0.11		0.19	0.19		0.70	0.65		0.61	0.60	
Clearance Time (s)		6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		308		134	308		322	2231		374	2021	
v/s Ratio Prot				c0.01	0.00		c0.02	0.26		0.00	c0.32	
v/s Ratio Perm		c0.06		0.03			0.20			0.02		
v/c Ratio		0.53		0.20	0.01		0.32	0.40		0.03	0.53	
Uniform Delay, d1		45.1		36.5	35.7		7.1	8.9		8.3	12.8	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.8		0.7	0.0		0.6	0.5		0.0	1.0	
Delay (s)		46.9		37.2	35.7		7.7	9.4		8.3	13.8	
Level of Service		D		D	D		A	A		A	B	
Approach Delay (s)		46.9			36.6			9.3			13.7	
Approach LOS		D			D			A			B	

Intersection Summary

HCM 2000 Control Delay	16.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	108.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	154	1	93	1	89	943	1157
v/c Ratio	0.59	0.00	0.37	0.00	0.24	0.37	0.52
Control Delay	47.1	35.0	11.1	0.0	5.2	5.4	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.1	35.0	11.1	0.0	5.2	5.4	11.3
Queue Length 50th (m)	28.1	0.2	0.0	0.0	2.9	24.3	53.6
Queue Length 95th (m)	48.4	1.6	12.3	0.0	11.3	59.1	109.1
Internal Link Dist (m)		62.1		66.5		199.1	252.7
Turn Bay Length (m)	25.0				70.0		
Base Capacity (vph)	261	480	386	527	394	2562	2235
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.00	0.24	0.00	0.23	0.37	0.52

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	154	1	93	0	0	1	89	942	1	0	1002	155
Future Volume (vph)	154	1	93	0	0	1	89	942	1	0	1002	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0		6.0		4.0	6.0			6.0	
Lane Util. Factor	1.00	1.00	1.00		1.00		1.00	0.95			0.95	
Frpb, ped/bikes	1.00	1.00	1.00		1.00		1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85		0.85		1.00	1.00			0.98	
Flt Protected	0.95	1.00	1.00		1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1770	1900	1233		1615		1805	3471			3467	
Flt Permitted	0.70	1.00	1.00		1.00		0.18	1.00			1.00	
Satd. Flow (perm)	1307	1900	1233		1615		335	3471			3467	
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)	154	1	93	0	0	1	89	942	1	0	1002	155
RTOR Reduction (vph)	0	0	77	0	1	0	0	0	0	0	8	0
Lane Group Flow (vph)	154	1	16	0	0	0	89	943	0	0	1149	0
Confl. Peds. (#/hr)							2		2	2		2
Heavy Vehicles (%)	2%	0%	31%	0%	0%	0%	0%	4%	0%	0%	2%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	17.6	17.6	17.6		1.7		70.7	70.7			60.8	
Effective Green, g (s)	17.6	17.6	17.6		1.7		70.7	70.7			60.8	
Actuated g/C Ratio	0.18	0.18	0.18		0.02		0.70	0.70			0.61	
Clearance Time (s)	4.0	6.0	6.0		6.0		4.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	284	333	216		27		322	2446			2101	
v/s Ratio Prot	c0.06	0.00			0.00		0.02	c0.27			c0.33	
v/s Ratio Perm	c0.03		0.01				0.18					
v/c Ratio	0.54	0.00	0.08		0.00		0.28	0.39			0.55	
Uniform Delay, d1	37.4	34.1	34.6		48.5		6.6	6.0			11.6	
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00			1.00	
Incremental Delay, d2	2.1	0.0	0.1		0.0		0.5	0.5			1.0	
Delay (s)	39.5	34.1	34.7		48.5		7.1	6.5			12.7	
Level of Service	D	C	C		D		A	A			B	
Approach Delay (s)		37.7			48.5			6.5			12.7	
Approach LOS		D			D			A			B	

Intersection Summary

HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	101	23	62	70	32	64	980	87	1139
v/c Ratio	0.24	0.07	0.17	0.18	0.10	0.23	0.57	0.31	0.65
Control Delay	32.3	41.3	3.2	31.4	20.8	10.9	23.1	12.1	24.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.3	41.3	3.2	31.4	20.8	10.9	23.1	12.1	24.1
Queue Length 50th (m)	18.3	4.8	0.0	12.5	1.9	5.8	87.4	8.0	105.3
Queue Length 95th (m)	32.7	12.5	4.1	24.3	11.0	11.4	108.2	14.9	129.1
Internal Link Dist (m)		132.6			203.0		252.7		204.9
Turn Bay Length (m)	50.0		50.0	30.0		70.0		65.0	
Base Capacity (vph)	414	348	373	396	325	282	1706	277	1751
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	0.24	0.07	0.17	0.18	0.10	0.23	0.57	0.31	0.65

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	101	23	62	70	9	23	64	930	50	87	1025	114
Future Volume (vph)	101	23	62	70	9	23	64	930	50	87	1025	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.89		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1900	1593	1717	1671		1805	3465		1455	3488	
Flt Permitted	0.74	1.00	1.00	0.74	1.00		0.15	1.00		0.20	1.00	
Satd. Flow (perm)	1399	1900	1593	1342	1671		290	3465		302	3488	
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)	101	23	62	70	9	23	64	930	50	87	1025	114
RTOR Reduction (vph)	0	0	51	0	19	0	0	3	0	0	7	0
Lane Group Flow (vph)	101	23	11	70	13	0	64	977	0	87	1132	0
Confl. Peds. (#/hr)			1	1			3		3	3		3
Heavy Vehicles (%)	0%	0%	0%	5%	0%	2%	0%	3%	8%	24%	2%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	31.0	22.0	22.0	31.0	22.0		68.0	59.0		70.0	60.0	
Effective Green, g (s)	31.0	22.0	22.0	31.0	22.0		68.0	59.0		70.0	60.0	
Actuated g/C Ratio	0.26	0.18	0.18	0.26	0.18		0.57	0.49		0.58	0.50	
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Grp Cap (vph)	391	348	292	374	306		277	1703		272	1744	
v/s Ratio Prot	c0.02	0.01		0.01	0.01		0.02	0.28		c0.03	c0.32	
v/s Ratio Perm	c0.05		0.01	0.03			0.11			0.16		
v/c Ratio	0.26	0.07	0.04	0.19	0.04		0.23	0.57		0.32	0.65	
Uniform Delay, d1	35.0	40.5	40.3	34.4	40.3		14.2	21.6		13.0	22.2	
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	0.4	0.2	1.1	0.3		1.9	1.4		3.1	1.9	
Delay (s)	36.6	40.9	40.6	35.5	40.6		16.2	23.0		16.1	24.1	
Level of Service	D	D	D	D	D		B	C		B	C	
Approach Delay (s)		38.4			37.1			22.6			23.5	
Approach LOS		D			D			C			C	

Intersection Summary

HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	0	9	78	0	30	7	1048	19	8	981	6
Future Volume (Veh/h)	25	0	9	78	0	30	7	1048	19	8	981	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	25	0	9	78	0	30	7	1048	19	8	981	6
Pedestrians					3						1	
Lane Width (m)					3.6						3.6	
Walking Speed (m/s)					1.2						1.2	
Percent Blockage					0						0	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								229				
pX, platoon unblocked	0.81	0.81		0.81	0.81	0.81				0.81		
vC, conflicting volume	1569	2084	494	1590	2078	538	987			1070		
vC1, stage 1 conf vol	1000	1000		1074	1074							
vC2, stage 2 conf vol	569	1084		516	1003							
vCu, unblocked vol	1226	1864	494	1252	1856	0	987			607		
tC, single (s)	7.5	6.5	6.9	7.6	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.6	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	90	100	98	73	100	97	99			99		
cM capacity (veh/h)	246	240	521	292	239	877	696			789		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	34	108	7	699	368	8	654	333
Volume Left	25	78	7	0	0	8	0	0
Volume Right	9	30	0	0	19	0	0	6
cSH	286	359	696	1700	1700	789	1700	1700
Volume to Capacity	0.12	0.30	0.01	0.41	0.22	0.01	0.38	0.20
Queue Length 95th (m)	3.2	9.9	0.2	0.0	0.0	0.2	0.0	0.0
Control Delay (s)	19.3	19.3	10.2	0.0	0.0	9.6	0.0	0.0
Lane LOS	C	C	B			A		
Approach Delay (s)	19.3	19.3	0.1			0.1		
Approach LOS	C	C						

Intersection Summary				
Average Delay	1.3			
Intersection Capacity Utilization	43.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	110	110	41	1060	886	28
Future Volume (Veh/h)	110	110	41	1060	886	28
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	110	110	41	1060	886	28
Pedestrians	1					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)					276	
pX, platoon unblocked	0.93	0.93	0.93			
vC, conflicting volume	1513	458	915			
vC1, stage 1 conf vol	901					
vC2, stage 2 conf vol	612					
vCu, unblocked vol	1401	266	758			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	66	84	95			
cM capacity (veh/h)	324	686	801			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	110	110	41	530	530	591	323
Volume Left	110	0	41	0	0	0	0
Volume Right	0	110	0	0	0	0	28
cSH	324	686	801	1700	1700	1700	1700
Volume to Capacity	0.34	0.16	0.05	0.31	0.31	0.35	0.19
Queue Length 95th (m)	11.7	4.6	1.3	0.0	0.0	0.0	0.0
Control Delay (s)	21.8	11.3	9.7	0.0	0.0	0.0	0.0
Lane LOS	C	B	A				
Approach Delay (s)	16.5		0.4			0.0	
Approach LOS	C						

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	44.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	35	27	10	1131	854	17
Future Volume (Veh/h)	35	27	10	1131	854	17
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	35	27	10	1131	854	17
Pedestrians	2					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)					122	
pX, platoon unblocked	0.91	0.91	0.91			
vC, conflicting volume	1450	438	873			
vC1, stage 1 conf vol	864					
vC2, stage 2 conf vol	586					
vCu, unblocked vol	1306	199	675			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	96	99			
cM capacity (veh/h)	352	744	845			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	62	10	566	566	569	302
Volume Left	35	10	0	0	0	0
Volume Right	27	0	0	0	0	17
cSH	457	845	1700	1700	1700	1700
Volume to Capacity	0.14	0.01	0.33	0.33	0.33	0.18
Queue Length 95th (m)	3.7	0.3	0.0	0.0	0.0	0.0
Control Delay (s)	14.1	9.3	0.0	0.0	0.0	0.0
Lane LOS	B	A				
Approach Delay (s)	14.1	0.1			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	41.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	208	819	213	288	560	217	422	743	167	361	228
v/c Ratio	0.70	0.80	0.40	0.86	0.51	0.37	0.86	0.70	0.59	0.48	0.48
Control Delay	32.5	45.5	15.1	50.8	36.0	14.6	43.5	38.2	31.1	43.8	8.8
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	32.5	45.5	15.1	50.8	36.0	14.6	43.5	38.2	31.1	43.8	8.8
Queue Length 50th (m)	30.5	99.1	14.3	47.2	60.6	14.8	75.6	80.3	25.0	41.8	0.0
Queue Length 95th (m)	49.1	124.2	36.3	#93.7	78.9	36.5	#108.3	103.5	40.4	57.6	21.9
Internal Link Dist (m)		844.2			279.6			97.5		104.6	
Turn Bay Length (m)	25.0		25.0	40.0		25.0	100.0		40.0		50.0
Base Capacity (vph)	317	1028	532	352	1100	581	497	1059	297	748	475
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	0.80	0.40	0.82	0.51	0.37	0.85	0.70	0.56	0.48	0.48

Intersection Summary

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

HCM Signalized Intersection Capacity Analysis
33: Bayview Drive & Big Bay Point Road

210434
2031 Future Total - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	208	819	213	288	560	217	422	516	227	167	361	228
Future Volume (vph)	208	819	213	288	560	217	422	516	227	167	361	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		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)	1253	3471	1476	1770	3574	1583	1735	3387		1770	3539	1396
Flt Permitted	0.33	1.00	1.00	0.14	1.00	1.00	0.37	1.00		0.28	1.00	1.00
Satd. Flow (perm)	440	3471	1476	260	3574	1583	675	3387		514	3539	1396
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)	208	819	213	288	560	217	422	516	227	167	361	228
RTOR Reduction (vph)	0	0	96	0	0	94	0	41	0	0	0	180
Lane Group Flow (vph)	208	819	117	288	560	123	422	702	0	167	361	48
Confl. Peds. (#/hr)			1	1			2					2
Heavy Vehicles (%)	44%	4%	8%	2%	1%	2%	4%	2%	1%	2%	2%	14%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	50.3	35.0	35.0	53.1	36.4	36.4	50.5	35.6		35.9	25.0	25.0
Effective Green, g (s)	50.3	35.0	35.0	53.1	36.4	36.4	50.5	35.6		35.9	25.0	25.0
Actuated g/C Ratio	0.43	0.30	0.30	0.45	0.31	0.31	0.43	0.30		0.30	0.21	0.21
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	6.0
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)	292	1027	437	330	1100	487	481	1020		271	748	295
v/s Ratio Prot	0.09	0.24		c0.12	0.16		c0.16	0.21		0.06	0.10	
v/s Ratio Perm	0.21		0.08	c0.27		0.08	c0.22			0.13		0.03
v/c Ratio	0.71	0.80	0.27	0.87	0.51	0.25	0.88	0.69		0.62	0.48	0.16
Uniform Delay, d1	23.9	38.3	31.8	27.3	33.6	30.7	26.3	36.4		31.9	40.9	38.1
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	8.0	4.4	0.3	21.5	0.4	0.3	16.4	3.8		4.1	2.2	1.2
Delay (s)	31.8	42.7	32.1	48.9	33.9	31.0	42.7	40.2		36.0	43.1	39.2
Level of Service	C	D	C	D	C	C	D	D		D	D	D
Approach Delay (s)		39.1			37.4			41.1			40.4	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	39.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	118.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	105.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Queues
39: Bryne Drive & Mapleview Drive W

210434
2031 Future Total - PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	109	1342	209	1362	99	418	48	48
v/c Ratio	0.35	0.44	0.57	0.41	0.46	0.73	0.28	0.15
Control Delay	9.0	15.7	34.0	1.9	51.7	22.3	46.4	31.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.0	15.7	34.0	1.9	51.7	22.3	46.4	31.5
Queue Length 50th (m)	6.7	67.7	23.6	7.1	23.3	14.0	11.0	3.1
Queue Length 95th (m)	14.3	101.6	48.5	8.2	38.3	30.7	21.4	9.2
Internal Link Dist (m)		279.3		65.0		101.6		166.7
Turn Bay Length (m)	60.0		50.0		45.0		50.0	
Base Capacity (vph)	356	3019	475	3342	217	903	176	692
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	0.31	0.44	0.44	0.41	0.46	0.46	0.27	0.07

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	109	1229	113	209	1349	13	99	102	316	48	23	25
Future Volume (vph)	109	1229	113	209	1349	13	99	102	316	48	23	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.89		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	4975		1769	5126		1792	3144		1787	3236	
Flt Permitted	0.17	1.00		0.15	1.00		0.57	1.00		0.41	1.00	
Satd. Flow (perm)	329	4975		280	5126		1080	3144		768	3236	
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)	109	1229	113	209	1349	13	99	102	316	48	23	25
RTOR Reduction (vph)	0	6	0	0	0	0	0	286	0	0	23	0
Lane Group Flow (vph)	109	1336	0	209	1362	0	99	132	0	48	25	0
Confl. Peds. (#/hr)	8		7	7		8	10		1	1		10
Heavy Vehicles (%)	0%	3%	0%	2%	1%	4%	0%	0%	1%	1%	3%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	85.5	77.6		95.4	83.5		21.2	12.4		16.0	9.8	
Effective Green, g (s)	85.5	77.6		95.4	83.5		21.2	12.4		16.0	9.8	
Actuated g/C Ratio	0.66	0.60		0.73	0.64		0.16	0.10		0.12	0.08	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	306	2969		363	3292		224	299		143	243	
v/s Ratio Prot	0.02	0.27		c0.06	0.27		c0.03	0.04		0.02	0.01	
v/s Ratio Perm	0.21			c0.36			c0.04			0.03		
v/c Ratio	0.36	0.45		0.58	0.41		0.44	0.44		0.34	0.10	
Uniform Delay, d1	8.3	14.4		8.1	11.3		48.2	55.5		51.5	56.0	
Progression Factor	1.00	1.00		4.64	0.14		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	0.5		1.7	0.3		1.4	1.0		1.4	0.2	
Delay (s)	9.0	14.9		39.5	1.9		49.6	56.6		52.9	56.2	
Level of Service	A	B		D	A		D	E		D	E	
Approach Delay (s)		14.5			6.9			55.2			54.5	
Approach LOS		B			A			E			D	

Intersection Summary			
HCM 2000 Control Delay	18.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
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	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	5	689	4	106	691	47	58	367	176	340	345	95
v/c Ratio	0.03	0.51	0.01	0.53	0.51	0.07	0.11	0.20	0.20	0.67	0.19	0.11
Control Delay	23.8	30.0	0.0	40.2	30.0	7.0	15.7	16.0	7.4	29.7	15.9	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	23.8	30.0	0.0	40.2	30.0	7.0	15.7	16.0	7.4	29.7	15.9	3.2
Queue Length 50th (m)	0.8	68.0	0.0	20.1	68.3	0.0	7.1	24.8	9.1	60.3	23.2	0.0
Queue Length 95th (m)	3.6	86.6	0.0	41.1	86.9	8.0	14.9	34.3	21.3	98.3	32.2	8.5
Internal Link Dist (m)		259.3			844.2			279.0			144.9	
Turn Bay Length (m)	60.0		60.0	60.0		60.0	60.0		60.0	60.0		60.0
Base Capacity (vph)	200	1356	623	201	1356	635	519	1828	866	505	1828	863
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	0.03	0.51	0.01	0.53	0.51	0.07	0.11	0.20	0.20	0.67	0.19	0.11

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	689	4	106	691	47	58	367	176	340	345	95
Future Volume (vph)	5	689	4	106	691	47	58	367	176	340	345	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	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)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.28	1.00	1.00	0.28	1.00	1.00	0.54	1.00	1.00	0.52	1.00	1.00
Satd. Flow (perm)	524	3539	1583	526	3539	1583	1006	3539	1583	978	3539	1583
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	689	4	106	691	47	58	367	176	340	345	95
RTOR Reduction (vph)	0	0	2	0	0	29	0	0	49	0	0	46
Lane Group Flow (vph)	5	689	2	106	691	18	58	367	127	340	345	49
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	46.0	46.0	46.0	46.0	46.0	46.0	62.0	62.0	62.0	62.0	62.0	62.0
Effective Green, g (s)	46.0	46.0	46.0	46.0	46.0	46.0	62.0	62.0	62.0	62.0	62.0	62.0
Actuated g/C Ratio	0.38	0.38	0.38	0.38	0.38	0.38	0.52	0.52	0.52	0.52	0.52	0.52
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Grp Cap (vph)	200	1356	606	201	1356	606	519	1828	817	505	1828	817
v/s Ratio Prot		0.19			0.20			0.10			0.10	
v/s Ratio Perm	0.01		0.00	c0.20		0.01	0.06		0.08	c0.35		0.03
v/c Ratio	0.03	0.51	0.00	0.53	0.51	0.03	0.11	0.20	0.16	0.67	0.19	0.06
Uniform Delay, d1	23.0	28.3	22.8	28.6	28.4	23.1	14.9	15.6	15.2	21.5	15.5	14.5
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	0.2	1.4	0.0	9.6	1.4	0.1	0.4	0.2	0.4	7.0	0.2	0.1
Delay (s)	23.3	29.7	22.8	38.2	29.7	23.2	15.3	15.9	15.6	28.5	15.8	14.6
Level of Service	C	C	C	D	C	C	B	B	B	C	B	B
Approach Delay (s)		29.6			30.4			15.8			21.2	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	24.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	B38	B38	B38	WB	WB	WB	WB
Directions Served	L	T	T	T	TR	T	T	T	L	L	T	T
Maximum Queue (m)	56.3	99.0	96.6	80.2	78.7	11.2	13.2	8.8	55.0	63.2	62.3	76.9
Average Queue (m)	14.0	55.9	56.7	45.9	40.5	1.0	1.1	0.3	31.5	37.7	19.0	26.1
95th Queue (m)	39.6	89.0	89.0	75.8	68.5	10.9	11.0	6.2	50.7	56.0	42.5	53.4
Link Distance (m)		86.8	86.8	86.8	86.8	65.4	65.4	65.4			114.0	114.0
Upstream Blk Time (%)		2	2	0	0							
Queuing Penalty (veh)		7	6	1	1							
Storage Bay Dist (m)	70.0								65.0	65.0		
Storage Blk Time (%)		4							0	0	0	
Queuing Penalty (veh)		2							0	2	0	

Intersection: 3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

Movement	WB	NB	NB	NB	SB	SB	SB
Directions Served	TR	L	T	R	L	T	TR
Maximum Queue (m)	95.8	31.3	40.0	90.7	47.4	169.7	105.2
Average Queue (m)	36.3	11.5	18.6	69.7	45.7	103.1	17.1
95th Queue (m)	68.8	24.7	33.1	103.9	52.7	203.8	71.3
Link Distance (m)	114.0		86.1	86.1		180.4	180.4
Upstream Blk Time (%)	0			19		12	
Queuing Penalty (veh)	0			0		0	
Storage Bay Dist (m)		20.0			40.0		
Storage Blk Time (%)		4	15		66	1	
Queuing Penalty (veh)		4	8		6	4	

Intersection: 6: Mapleview Drive W & Highway 400 SB Off-Ramp

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	T	R	L	T	T	T	L	L	R
Maximum Queue (m)	118.3	122.6	118.6	112.2	84.4	128.9	68.0	60.0	79.3	307.5	354.8	347.5
Average Queue (m)	70.8	73.5	61.0	53.1	12.4	63.8	38.1	37.7	48.5	269.9	293.5	171.8
95th Queue (m)	121.3	122.4	111.9	94.0	49.6	109.9	58.1	52.2	66.3	350.0	397.3	397.9
Link Distance (m)	114.0	114.0	114.0	114.0			168.4	168.4	168.4		326.9	326.9
Upstream Blk Time (%)	1	1	0	0							37	14
Queuing Penalty (veh)	5	5	1	1							0	0
Storage Bay Dist (m)					45.0	135.0				300.0		
Storage Blk Time (%)				12		0				8	42	19
Queuing Penalty (veh)				21		1				27	137	25

Intersection: 6: Mapleview Drive W & Highway 400 SB Off-Ramp

Movement	SB	B36	B36
Directions Served	R	T	T
Maximum Queue (m)	295.6	142.4	136.4
Average Queue (m)	130.9	51.1	46.1
95th Queue (m)	344.8	162.8	156.3
Link Distance (m)		176.9	176.9
Upstream Blk Time (%)		10	9
Queuing Penalty (veh)		0	0
Storage Bay Dist (m)	300.0		
Storage Blk Time (%)	0		
Queuing Penalty (veh)	0		

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (m)	121.6	121.9	134.0	116.4	102.5	97.4	68.4	98.7	160.6	86.7	85.2	100.5
Average Queue (m)	68.4	70.6	47.4	36.8	40.7	66.5	43.8	53.7	107.7	49.9	48.8	63.3
95th Queue (m)	114.5	117.8	110.2	87.0	86.4	93.2	61.8	107.1	162.0	74.2	73.7	89.5
Link Distance (m)		168.4	168.4	168.4	168.4	218.3	218.3	218.3			335.8	335.8
Upstream Blk Time (%)		0	0									
Queuing Penalty (veh)		0	0									
Storage Bay Dist (m)	130.0								130.0	265.0		
Storage Blk Time (%)	1	1							7			
Queuing Penalty (veh)	2	2							45			

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	NB
Directions Served	R
Maximum Queue (m)	87.9
Average Queue (m)	47.9
95th Queue (m)	77.1
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	265.0
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	L
Maximum Queue (m)	118.2	120.0	146.0	140.7	142.0	12.7	57.3	125.9	128.4	143.1	168.1	57.4
Average Queue (m)	71.9	77.0	78.5	66.8	73.4	4.5	15.3	65.9	99.9	123.7	106.0	55.3
95th Queue (m)	115.1	119.1	129.2	110.9	115.8	11.8	41.8	112.3	144.3	155.5	215.0	66.4
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)								0	0	8	11	
Queuing Penalty (veh)								0	0	40	56	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)			0		0		0	15				11
Queuing Penalty (veh)			1		0		0	10				37

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R
Maximum Queue (m)	141.4	133.3	67.3	100.6	100.6
Average Queue (m)	131.1	75.3	43.2	51.6	100.6
95th Queue (m)	151.1	171.2	71.5	124.5	100.6
Link Distance (m)	128.7	128.7		96.0	96.0
Upstream Blk Time (%)	58	13		10	91
Queuing Penalty (veh)	0	0		0	0
Storage Bay Dist (m)			60.0		
Storage Blk Time (%)	62		13		
Queuing Penalty (veh)	204		6		

Intersection: 15: Bayview Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	T	R	L	T	T	TR	L	L
Maximum Queue (m)	82.3	93.4	96.8	62.3	60.7	30.8	25.8	248.6	257.8	262.9	79.2	87.9
Average Queue (m)	63.2	68.8	40.7	37.7	38.3	13.2	5.9	133.0	242.8	251.8	31.8	49.0
95th Queue (m)	85.0	91.9	88.5	59.9	58.9	27.1	17.6	283.7	289.5	258.8	69.6	86.6
Link Distance (m)			131.2	131.2	131.2			244.4	244.4	244.4		
Upstream Blk Time (%)			0					2	46	95		
Queuing Penalty (veh)			2					0	0	0		
Storage Bay Dist (m)	70.0	70.0				50.0	120.0				95.0	95.0
Storage Blk Time (%)	9	19			5			1			0	1
Queuing Penalty (veh)	41	85			6			0			0	1

Intersection: 15: Bayview Drive & Mapleview Drive W

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	TR	L	T	T	R
Maximum Queue (m)	64.7	57.2	120.6	218.9	217.4	80.0
Average Queue (m)	30.7	28.9	110.3	144.6	94.7	58.7
95th Queue (m)	55.5	51.6	137.6	283.2	227.0	100.2
Link Distance (m)	218.2	218.2		214.5	214.5	
Upstream Blk Time (%)				14	0	
Queuing Penalty (veh)				74	2	
Storage Bay Dist (m)			110.0			45.0
Storage Blk Time (%)	0		57	1	0	26
Queuing Penalty (veh)	0		48	4	2	21

Intersection: 18: Bayview Drive & South Village Way/Barrie Molson Centre D/W

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	61.4	50.2	27.7	13.0	70.9	90.1	97.0	37.7	117.1	153.2
Average Queue (m)	28.8	19.0	8.3	3.4	18.2	33.5	35.8	4.8	49.5	77.4
95th Queue (m)	48.3	37.9	21.1	10.8	42.1	73.8	78.9	24.6	101.0	147.2
Link Distance (m)	126.0	126.0	60.2	60.2		214.5	214.5		195.2	195.2
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)					70.0			50.0		
Storage Blk Time (%)					0	1			14	
Queuing Penalty (veh)					0	1			2	

Intersection: 21: Bayview Drive & North Village Way/Private D/W

Movement	EB	EB	EB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	R	TR	L	T	TR	T	TR
Maximum Queue (m)	43.7	41.4	38.2	4.8	28.5	59.5	64.7	111.0	129.8
Average Queue (m)	24.1	2.0	17.9	0.2	10.3	19.1	20.2	33.5	54.9
95th Queue (m)	39.6	16.8	33.4	2.5	20.6	45.3	48.9	79.2	107.4
Link Distance (m)		71.5	71.5	75.9		195.2	195.2	247.7	247.7
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (m)	25.0				70.0				
Storage Blk Time (%)	12	0				0		1	
Queuing Penalty (veh)	0	0				0		0	

Intersection: 24: Bayview Drive & Concert Way/Churchill Drive

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	40.6	20.9	21.7	32.5	17.7	77.2	99.1	95.6	57.0	102.5	110.7
Average Queue (m)	17.0	5.6	8.6	12.6	4.7	12.2	56.0	55.9	15.6	55.1	72.5
95th Queue (m)	32.3	16.1	18.0	26.8	13.2	39.9	87.6	88.0	37.6	82.1	102.2
Link Distance (m)		140.4			212.1		247.7	247.7		206.2	206.2
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (m)	50.0		50.0	30.0		70.0			65.0		
Storage Blk Time (%)	0			1	0		3		0	1	
Queuing Penalty (veh)	0			0	0		2		0	1	

Intersection: 28: Bayview Drive & Industrial Site D/W South/Coca-Cola D/W

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	T	L	TR
Maximum Queue (m)	24.5	58.0	8.2	4.3	7.8	5.3
Average Queue (m)	8.9	21.8	1.0	0.2	0.8	0.2
95th Queue (m)	18.9	44.2	5.4	2.4	4.6	2.7
Link Distance (m)	196.9	182.1		206.2		206.3
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			15.0		15.0	
Storage Blk Time (%)				0		
Queuing Penalty (veh)				0		

Intersection: 29: Bayview Drive & Medical Centre South D/W

Movement	EB	EB	NB	NB	NB	SB
Directions Served	L	R	L	T	T	TR
Maximum Queue (m)	82.1	40.5	19.0	49.6	34.6	3.2
Average Queue (m)	30.3	13.7	5.4	6.2	2.5	0.1
95th Queue (m)	68.6	35.9	14.9	38.5	22.8	2.2
Link Distance (m)	102.1	102.1		206.3	206.3	137.8
Upstream Blk Time (%)	2	1				
Queuing Penalty (veh)	0	0				
Storage Bay Dist (m)			15.0			
Storage Blk Time (%)			1	2		
Queuing Penalty (veh)			4	1		

Intersection: 31: Bayview Drive & Medical Centre North D/W

Movement	EB	NB	NB	NB	SB
Directions Served	LR	L	T	T	T
Maximum Queue (m)	100.0	12.6	142.5	139.1	1.8
Average Queue (m)	56.1	1.9	60.4	41.5	0.1
95th Queue (m)	127.2	9.4	147.6	122.5	1.2
Link Distance (m)	108.5		137.8	137.8	92.4
Upstream Blk Time (%)	30		2	0	
Queuing Penalty (veh)	0		11	2	
Storage Bay Dist (m)		15.0			
Storage Blk Time (%)		0	35		
Queuing Penalty (veh)		0	4		

Intersection: 33: Bayview Drive & Big Bay Point Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	TR	L
Maximum Queue (m)	75.0	200.9	184.5	75.0	93.4	118.2	93.4	56.7	92.3	112.5	98.1	62.0
Average Queue (m)	64.8	115.6	107.2	47.6	55.5	61.3	50.5	17.4	84.1	91.6	65.2	32.9
95th Queue (m)	91.8	190.9	176.1	94.4	90.8	107.2	88.8	35.5	107.8	127.3	110.8	55.8
Link Distance (m)		835.5	835.5			287.9	287.9			92.4	92.4	
Upstream Blk Time (%)									16	35	7	
Queuing Penalty (veh)									0	201	38	
Storage Bay Dist (m)	25.0			25.0	40.0			25.0	100.0			40.0
Storage Blk Time (%)	52	59	63	6	35	22	29	1	16	35		9
Queuing Penalty (veh)	212	124	134	25	98	63	63	2	42	146		17

Intersection: 33: Bayview Drive & Big Bay Point Road

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (m)	65.3	65.3	59.0
Average Queue (m)	37.4	33.1	22.2
95th Queue (m)	56.8	54.2	43.0
Link Distance (m)	101.3	101.3	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			50.0
Storage Blk Time (%)	8	2	0
Queuing Penalty (veh)	14	4	0

Intersection: 37: Bend

Movement	NB
Directions Served	T
Maximum Queue (m)	22.4
Average Queue (m)	1.5
95th Queue (m)	22.5
Link Distance (m)	101.3
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 39: Bryne Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	B38	NB	NB	NB
Directions Served	L	T	T	TR	L	T	T	TR	T	L	T	TR
Maximum Queue (m)	61.4	86.0	98.2	91.0	55.6	55.4	31.5	21.1	1.4	40.6	44.3	81.6
Average Queue (m)	16.8	46.7	57.5	45.7	31.5	8.9	8.1	6.1	0.0	17.8	19.5	39.1
95th Queue (m)	35.1	75.0	86.3	78.6	52.0	31.0	20.2	16.5	1.0	33.1	36.8	73.4
Link Distance (m)		286.6	286.6	286.6		65.4	65.4	65.4	86.8		97.4	97.4
Upstream Blk Time (%)						0						0
Queuing Penalty (veh)						2						0
Storage Bay Dist (m)	60.0				50.0					45.0		
Storage Blk Time (%)		3			2	0				0	0	
Queuing Penalty (veh)		3			9	1				0	0	

Intersection: 39: Bryne Drive & Mapleview Drive W

Movement	SB	SB	SB
Directions Served	L	T	TR
Maximum Queue (m)	32.3	23.7	11.3
Average Queue (m)	12.1	6.6	3.9
95th Queue (m)	25.6	17.6	10.2
Link Distance (m)		172.2	172.2
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)	50.0		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 43: Bryne Road & Harvie Road/Big Bay Point Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	R
Maximum Queue (m)	11.4	95.4	83.8	8.9	69.7	69.7	71.0	15.9	28.8	48.2	39.0	33.0
Average Queue (m)	0.8	56.8	49.2	0.8	31.8	38.4	43.5	5.2	11.3	28.0	17.4	11.9
95th Queue (m)	5.5	82.2	73.8	4.8	63.7	60.0	63.9	13.7	23.0	44.7	34.9	24.9
Link Distance (m)		266.9	266.9			835.5	835.5			283.7	283.7	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	60.0			60.0	60.0			60.0	60.0			60.0
Storage Blk Time (%)		6	2		6	0	1			0		
Queuing Penalty (veh)		0	0		20	0	0			0		

Intersection: 43: Bryne Road & Harvie Road/Big Bay Point Road

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (m)	80.0	159.1	140.8	19.3
Average Queue (m)	65.4	73.5	54.1	6.8
95th Queue (m)	91.5	169.8	137.2	15.9
Link Distance (m)		149.6	149.6	
Upstream Blk Time (%)		9	0	
Queuing Penalty (veh)		0	0	
Storage Bay Dist (m)	60.0			60.0
Storage Blk Time (%)	41	0	0	
Queuing Penalty (veh)	70	0	0	

Network Summary

Network wide Queuing Penalty: 2271

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	650	2042	1830	1027	471	559
v/c Ratio	0.87	0.58	0.80	0.65	0.65	0.90
Control Delay	41.0	11.8	20.0	5.3	51.3	62.6
Queue Delay	0.0	1.5	0.0	0.0	0.2	0.0
Total Delay	41.0	13.3	20.0	5.3	51.5	62.6
Queue Length 50th (m)	69.5	164.0	76.4	36.4	59.4	74.8
Queue Length 95th (m)	94.0	175.8	m75.6	m38.9	78.0	#107.3
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	792	3507	2284	1583	765	655
Starvation Cap Reductn	0	1193	0	0	0	0
Spillback Cap Reductn	0	0	0	0	37	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.88	0.80	0.65	0.65	0.85

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)	650	2042	0	0	1830	1027	471	0	559	0	0	0
Future Volume (vph)	650	2042	0	0	1830	1027	471	0	559	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0			6.0	4.0	6.0		6.0			
Lane Util. Factor	0.97	0.91			0.91	1.00	0.97		0.88			
Frpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00			
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)	3433	5036			5085	1583	3433		2733			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3433	5036			5085	1583	3433		2733			
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)	650	2042	0	0	1830	1027	471	0	559	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	47	0	0	0
Lane Group Flow (vph)	650	2042	0	0	1830	1027	471	0	512	0	0	0
Confl. Peds. (#/hr)			3	3								
Heavy Vehicles (%)	2%	3%	0%	0%	2%	2%	2%	0%	4%	0%	0%	0%
Turn Type	Prot	NA			NA	Free	Prot		Perm			
Protected Phases	5	2			6		8					
Permitted Phases						Free			8			
Actuated Green, G (s)	28.1	90.5			58.4	130.0	27.5		27.5			
Effective Green, g (s)	28.1	90.5			58.4	130.0	27.5		27.5			
Actuated g/C Ratio	0.22	0.70			0.45	1.00	0.21		0.21			
Clearance Time (s)	4.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)	742	3505			2284	1583	726		578			
v/s Ratio Prot	c0.19	0.41			c0.36		0.14					
v/s Ratio Perm						0.65			c0.19			
v/c Ratio	0.88	0.58			0.80	0.65	0.65		0.89			
Uniform Delay, d1	49.3	10.1			30.8	0.0	46.8		49.7			
Progression Factor	0.65	1.10			0.60	1.00	1.00		1.00			
Incremental Delay, d2	7.2	0.4			1.0	0.7	2.0		15.2			
Delay (s)	39.2	11.5			19.4	0.7	48.8		64.9			
Level of Service	D	B			B	A	D		E			
Approach Delay (s)		18.2			12.7			57.6			0.0	
Approach LOS		B			B			E			A	

Intersection Summary

HCM 2000 Control Delay	22.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	86.3%	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)	417	1814	67	69	1707	256	659	90	227	50	492
v/c Ratio	0.90	0.90	0.09	0.43	1.08	0.42	0.83	0.21	0.82	0.17	0.84
Control Delay	80.5	26.4	0.4	25.9	72.8	5.7	56.7	33.6	76.7	50.8	48.6
Queue Delay	0.0	0.0	0.0	0.0	9.4	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.5	26.4	0.4	25.9	82.2	5.7	56.7	33.6	76.7	50.8	48.6
Queue Length 50th (m)	54.6	175.0	0.2	6.4	~181.9	3.7	87.0	16.2	59.6	11.8	107.1
Queue Length 95th (m)	m#89.7	#213.9	m0.7	m8.0	#213.0	m6.5	104.7	30.1	#115.7	25.2	#182.7
Internal Link Dist (m)		225.6			141.6			127.2		94.6	
Turn Bay Length (m)	160.0		175.0	50.0			50.0		60.0		
Base Capacity (vph)	461	2010	706	163	1584	605	933	492	277	292	587
Starvation Cap Reductn	0	0	0	0	44	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	0.90	0.90	0.09	0.42	1.11	0.42	0.71	0.18	0.82	0.17	0.84

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)	417	1814	67	69	1707	256	659	65	25	227	50	492
Future Volume (vph)	417	1814	67	69	1707	256	659	65	25	227	50	492
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		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)	3502	4940	1578	1787	5036	1529	3467	1788		1805	1900	1615
Flt Permitted	0.95	1.00	1.00	0.10	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	4940	1578	184	5036	1529	3467	1788		1805	1900	1615
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)	417	1814	67	69	1707	256	659	65	25	227	50	492
RTOR Reduction (vph)	0	0	40	0	0	125	0	12	0	0	0	54
Lane Group Flow (vph)	417	1814	27	69	1707	131	659	78	0	227	50	438
Confl. Peds. (#/hr)	3		1	1		3			2	2		
Heavy Vehicles (%)	0%	5%	1%	1%	3%	4%	1%	2%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases			2	6		6						4
Actuated Green, G (s)	17.1	52.2	52.2	46.9	41.0	41.0	29.9	29.9		20.0	20.0	37.1
Effective Green, g (s)	17.1	52.2	52.2	46.9	41.0	41.0	29.9	29.9		20.0	20.0	37.1
Actuated g/C Ratio	0.13	0.40	0.40	0.36	0.32	0.32	0.23	0.23		0.15	0.15	0.29
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0
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)	460	1983	633	139	1588	482	797	411		277	292	460
v/s Ratio Prot	0.12	0.37		0.02	c0.34		c0.19	0.04		0.13	0.03	c0.12
v/s Ratio Perm			0.02	0.16		0.09						0.15
v/c Ratio	0.91	0.91	0.04	0.50	1.07	0.27	0.83	0.19		0.82	0.17	0.95
Uniform Delay, d1	55.7	36.8	23.7	31.1	44.5	33.3	47.6	40.3		53.3	47.8	45.6
Progression Factor	1.10	0.53	0.22	1.12	0.71	0.43	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	19.8	6.4	0.1	1.3	40.2	0.7	7.0	0.2		17.0	0.3	29.8
Delay (s)	81.2	26.0	5.2	36.2	71.8	15.2	54.6	40.5		70.2	48.1	75.4
Level of Service	F	C	A	D	E	B	D	D		E	D	E
Approach Delay (s)		35.4			63.5			52.9			72.1	
Approach LOS		D			E			D			E	

Intersection Summary

HCM 2000 Control Delay	52.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	95.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (m)	94.5	90.7	116.8	103.9	97.6	115.0	79.4	77.7	81.6	82.2	86.0	108.8
Average Queue (m)	46.9	43.8	30.5	21.6	25.0	71.9	46.0	47.4	42.8	50.3	47.7	63.8
95th Queue (m)	76.9	74.7	88.0	65.2	66.1	104.4	69.9	67.1	76.0	76.1	75.5	94.1
Link Distance (m)		168.4	168.4	168.4	168.4	218.3	218.3	218.3			335.8	335.8
Upstream Blk Time (%)			0	0								
Queuing Penalty (veh)			0	0								
Storage Bay Dist (m)	130.0								130.0	265.0		
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	NB
Directions Served	R
Maximum Queue (m)	97.8
Average Queue (m)	47.7
95th Queue (m)	83.3
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	265.0
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	L
Maximum Queue (m)	73.5	77.4	140.5	120.0	117.0	14.2	48.9	135.2	132.9	142.1	160.8	57.4
Average Queue (m)	47.8	52.9	79.3	66.9	70.9	4.2	13.8	66.9	93.9	115.3	76.5	55.3
95th Queue (m)	69.4	73.8	124.7	105.3	106.2	11.1	38.4	117.8	146.5	152.9	190.6	64.6
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)								0	0	5	7	
Queuing Penalty (veh)								2	1	26	37	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)			0				0	16				9
Queuing Penalty (veh)			0				0	11				28

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R
Maximum Queue (m)	138.0	133.3	67.3	100.6	100.6
Average Queue (m)	118.1	51.4	58.9	63.2	94.8
95th Queue (m)	157.1	137.5	79.1	132.6	119.4
Link Distance (m)	128.7	128.7		96.0	96.0
Upstream Blk Time (%)	38	5		17	60
Queuing Penalty (veh)	0	0		0	0
Storage Bay Dist (m)			60.0		
Storage Blk Time (%)	54		44		
Queuing Penalty (veh)	178		22		

Zone Summary

Zone wide Queuing Penalty: 305

HCM Signalized Intersection Capacity Analysis
1: West Terminal

07-05-2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	1852	0	0	2043	0	0	0	0
Future Volume (vph)	0	0	0	0	1852	0	0	2043	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0			6.0				
Lane Util. Factor					0.91			0.91				
Frt					1.00			1.00				
Flt Protected					1.00			1.00				
Satd. Flow (prot)					5193			5142				
Flt Permitted					1.00			1.00				
Satd. Flow (perm)					5193			5142				
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	0	1852	0	0	2043	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1852	0	0	2043	0	0	0	0
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	2%	0%	0%	0%	0%
Turn Type					NA			NA				
Protected Phases					6			8				
Permitted Phases												
Actuated Green, G (s)					56.7			61.3				
Effective Green, g (s)					56.7			61.3				
Actuated g/C Ratio					0.44			0.47				
Clearance Time (s)					6.0			6.0				
Vehicle Extension (s)					3.0			3.0				
Lane Grp Cap (vph)					2264			2424				
v/s Ratio Prot					c0.36			c0.40				
v/s Ratio Perm												
v/c Ratio					0.82			0.84				
Uniform Delay, d1					32.1			30.1				
Progression Factor					0.65			1.00				
Incremental Delay, d2					2.4			2.8				
Delay (s)					23.1			33.0				
Level of Service					C			C				
Approach Delay (s)		0.0			23.1			33.0			0.0	
Approach LOS		A			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	28.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	85.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
2: W-N & N-E

07-05-2022

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2043	0	0	649	0
Future Volume (vph)	0	2043	0	0	649	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	
Lane Util. Factor		0.91			0.97	
Frt		1.00			1.00	
Flt Protected		1.00			0.95	
Satd. Flow (prot)		5142			3404	
Flt Permitted		1.00			0.95	
Satd. Flow (perm)		5142			3404	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2043	0	0	649	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	2043	0	0	649	0
Heavy Vehicles (%)	0%	2%	0%	0%	4%	0%
Turn Type		NA			Prot	
Protected Phases		4			6	
Permitted Phases						
Actuated Green, G (s)		62.0			56.0	
Effective Green, g (s)		62.0			56.0	
Actuated g/C Ratio		0.48			0.43	
Clearance Time (s)		6.0			6.0	
Vehicle Extension (s)		3.0			3.0	
Lane Grp Cap (vph)		2452			1466	
v/s Ratio Prot		c0.40			c0.19	
v/s Ratio Perm						
v/c Ratio		0.83			0.44	
Uniform Delay, d1		29.5			26.0	
Progression Factor		0.00			1.00	
Incremental Delay, d2		1.9			1.0	
Delay (s)		2.0			27.0	
Level of Service		A			C	
Approach Delay (s)		2.0	0.0		27.0	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: East Terminal

07-05-2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	2042	0	0	0	0	0	0	0	0	1830	0
Future Volume (vph)	0	2042	0	0	0	0	0	0	0	0	1830	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0									6.0	
Lane Util. Factor		0.91									0.91	
Frt		1.00									1.00	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		5092									5142	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		5092									5142	
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	2042	0	0	0	0	0	0	0	0	1830	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2042	0	0	0	0	0	0	0	0	1830	0
Heavy Vehicles (%)	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%
Turn Type		NA									NA	
Protected Phases		4									2	
Permitted Phases												
Actuated Green, G (s)		59.4									58.6	
Effective Green, g (s)		59.4									58.6	
Actuated g/C Ratio		0.46									0.45	
Clearance Time (s)		6.0									6.0	
Vehicle Extension (s)		3.0									3.0	
Lane Grp Cap (vph)		2326									2317	
v/s Ratio Prot		c0.40									c0.36	
v/s Ratio Perm												
v/c Ratio		0.88									0.79	
Uniform Delay, d1		32.0									30.4	
Progression Factor		0.69									1.00	
Incremental Delay, d2		2.9									2.8	
Delay (s)		25.0									33.3	
Level of Service		C									C	
Approach Delay (s)		25.0			0.0			0.0			33.3	
Approach LOS		C			A			A			C	

Intersection Summary				
HCM 2000 Control Delay	28.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	84.8%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
4: West Terminal/E-S

07-05-2022

Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Traffic Volume (veh/h)	0	0	449	1852	0	0
Future Volume (Veh/h)	0	0	449	1852	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	449	1852	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	67			77		
pX, platoon unblocked					0.69	
vC, conflicting volume			0		1515	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		160	0
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			72		100	100
cM capacity (veh/h)			1607		407	1091

Direction, Lane #	WB 1	WB 2	WB 3
Volume Total	819	741	741
Volume Left	449	0	0
Volume Right	0	0	0
cSH	1607	1700	1700
Volume to Capacity	0.28	0.44	0.44
Queue Length 95th (m)	8.8	0.0	0.0
Control Delay (s)	5.8	0.0	0.0
Lane LOS	A		
Approach Delay (s)	2.0		
Approach LOS			

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	62.7%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: W-S

07-05-2022

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	2043	180	0	0	0	0
Future Volume (Veh/h)	2043	180	0	0	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	2043	180	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				51		
pX, platoon unblocked						
vC, conflicting volume			2223		2043	681
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2223		2043	681
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			238		50	398

Direction, Lane #	EB 1	EB 2	EB 3	EB 4
Volume Total	681	681	681	180
Volume Left	0	0	0	0
Volume Right	0	0	0	180
cSH	1700	1700	1700	1700
Volume to Capacity	0.40	0.40	0.40	0.11
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0			
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	83.6%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
7: N-W

07-05-2022

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	1852	0	0	264
Future Volume (vph)	0	0	1852	0	0	264
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			6.0			6.0
Lane Util. Factor			0.91			0.88
Frt			1.00			0.85
Flt Protected			1.00			1.00
Satd. Flow (prot)			5193			2763
Flt Permitted			1.00			1.00
Satd. Flow (perm)			5193			2763
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	1852	0	0	264
RTOR Reduction (vph)	0	0	0	0	0	3
Lane Group Flow (vph)	0	0	1852	0	0	261
Heavy Vehicles (%)	0%	0%	1%	0%	0%	4%
Turn Type			NA			Prot
Protected Phases			2			8
Permitted Phases						
Actuated Green, G (s)			56.0			62.0
Effective Green, g (s)			56.0			62.0
Actuated g/C Ratio			0.43			0.48
Clearance Time (s)			6.0			6.0
Lane Grp Cap (vph)			2236			1317
v/s Ratio Prot			c0.36			c0.09
v/s Ratio Perm						
v/c Ratio			0.83			0.20
Uniform Delay, d1			32.7			19.6
Progression Factor			0.01			1.00
Incremental Delay, d2			2.1			0.3
Delay (s)			2.4			20.0
Level of Service			A			B
Approach Delay (s)		0.0	2.4		20.0	
Approach LOS		A	A		B	

Intersection Summary			
HCM 2000 Control Delay	4.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	85.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
12: E-N

07-05-2022

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (veh/h)	0	0	1830	1027	0	0
Future Volume (Veh/h)	0	0	1830	1027	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	1830	1027	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		32				
pX, platoon unblocked						
vC, conflicting volume	2857				1830	610
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2857				1830	610
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	134				69	442

Direction, Lane #	WB 1	WB 2	WB 3	WB 4
Volume Total	610	610	610	1027
Volume Left	0	0	0	0
Volume Right	0	0	0	1027
cSH	1700	1700	1700	1700
Volume to Capacity	0.36	0.36	0.36	0.60
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0			
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
14: S-E

07-05-2022

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2042	0	0	0	0	559
Future Volume (vph)	2042	0	0	0	0	559
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0					6.0
Lane Util. Factor	0.91					0.88
Frt	1.00					0.85
Flt Protected	1.00					1.00
Satd. Flow (prot)	5092					2763
Flt Permitted	1.00					1.00
Satd. Flow (perm)	5092					2763
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	2042	0	0	0	0	559
RTOR Reduction (vph)	0	0	0	0	0	2
Lane Group Flow (vph)	2042	0	0	0	0	557
Heavy Vehicles (%)	3%	0%	0%	0%	0%	4%
Turn Type	NA					Perm
Protected Phases	4					
Permitted Phases						2
Actuated Green, G (s)	61.0					57.0
Effective Green, g (s)	61.0					57.0
Actuated g/C Ratio	0.47					0.44
Clearance Time (s)	6.0					6.0
Lane Grp Cap (vph)	2389					1211
v/s Ratio Prot	c0.40					
v/s Ratio Perm						c0.20
v/c Ratio	0.85					0.46
Uniform Delay, d1	30.6					25.7
Progression Factor	0.00					1.00
Incremental Delay, d2	2.1					1.3
Delay (s)	2.1					26.9
Level of Service	A					C
Approach Delay (s)	2.1			0.0	26.9	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
16: W-N/East Terminal

07-05-2022

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Traffic Volume (veh/h)	650	2042	0	0	0	0
Future Volume (Veh/h)	650	2042	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	650	2042	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		75	74			
pX, platoon unblocked					0.66	
vC, conflicting volume	0				1981	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				666	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	60				100	100
cM capacity (veh/h)	1622				156	1091

Direction, Lane #	EB 1	EB 2	EB 3
Volume Total	1058	817	817
Volume Left	650	0	0
Volume Right	0	0	0
cSH	1622	1700	1700
Volume to Capacity	0.40	0.48	0.48
Queue Length 95th (m)	15.0	0.0	0.0
Control Delay (s)	7.1	0.0	0.0
Lane LOS	A		
Approach Delay (s)	2.8		
Approach LOS			

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	122.9%	ICU Level of Service	H
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
17: S-W & E-S

07-05-2022

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1830	471	0
Future Volume (vph)	0	0	0	1830	471	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.0	6.0	
Lane Util. Factor				0.91	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				5142	3471	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				5142	3471	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	1830	471	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	1830	471	0
Heavy Vehicles (%)	0%	0%	0%	2%	2%	0%
Turn Type				NA	Prot	
Protected Phases				8	2	
Permitted Phases						
Actuated Green, G (s)				57.0	61.0	
Effective Green, g (s)				57.0	61.0	
Actuated g/C Ratio				0.44	0.47	
Clearance Time (s)				6.0	6.0	
Vehicle Extension (s)				3.0	3.0	
Lane Grp Cap (vph)				2254	1628	
v/s Ratio Prot				c0.36	c0.14	
v/s Ratio Perm						
v/c Ratio				0.81	0.29	
Uniform Delay, d1				31.8	21.2	
Progression Factor				0.04	1.00	
Incremental Delay, d2				2.0	0.4	
Delay (s)				3.1	21.6	
Level of Service				A	C	
Approach Delay (s)	0.0			3.1	21.6	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	6.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 1: West Terminal

Movement	WB	WB	WB	NE	NE	NE
Directions Served	T	T	T	T	T	T
Maximum Queue (m)	47.7	53.1	48.6	33.1	39.8	41.1
Average Queue (m)	41.7	46.0	45.4	29.8	29.4	30.0
95th Queue (m)	50.1	48.7	48.0	32.2	35.5	35.7
Link Distance (m)	18.6	18.6	18.6	25.6	25.6	25.6
Upstream Blk Time (%)	45	57	56	56	39	48
Queuing Penalty (veh)	279	353	346	383	268	325
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: W-N & N-E

Movement	EB	EB	EB	SB	SB
Directions Served	T	T	T	L	L
Maximum Queue (m)	32.4	29.6	29.7	66.7	59.0
Average Queue (m)	21.0	9.4	13.9	54.9	41.0
95th Queue (m)	33.5	24.8	28.1	65.4	55.5
Link Distance (m)	22.8	22.8	22.8	37.0	37.0
Upstream Blk Time (%)	8	5	11	26	11
Queuing Penalty (veh)	52	36	73	86	35
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: East Terminal

Movement	EB	EB	EB	SW	SW	SW
Directions Served	T	T	T	T	T	T
Maximum Queue (m)	69.8	68.1	61.9	46.6	43.7	42.9
Average Queue (m)	59.4	57.0	55.0	36.6	36.6	34.2
95th Queue (m)	65.5	64.3	65.2	41.4	39.6	44.4
Link Distance (m)	27.3	27.3	27.3	19.8	19.8	19.8
Upstream Blk Time (%)	42	46	50	61	52	35
Queuing Penalty (veh)	283	313	341	370	318	213
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: West Terminal/E-S

Movement	WB	WB	WB
Directions Served	LT	T	T
Maximum Queue (m)	72.8	71.5	70.3
Average Queue (m)	56.3	50.6	42.5
95th Queue (m)	78.2	75.2	72.0
Link Distance (m)	59.5	59.5	59.5
Upstream Blk Time (%)	19	10	8
Queuing Penalty (veh)	146	78	62
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: W-S

Movement	EB	EB	EB	EB
Directions Served	T	T	T	R
Maximum Queue (m)	193.2	193.1	183.7	184.8
Average Queue (m)	182.9	181.8	163.3	64.1
95th Queue (m)	188.6	192.5	207.9	203.8
Link Distance (m)	176.8	176.8	176.8	176.8
Upstream Blk Time (%)	83	63	9	3
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: N-W

Movement	WB	WB	WB	SB	SB
Directions Served	T	T	T	R	R
Maximum Queue (m)	7.8	19.1	22.8	52.4	37.4
Average Queue (m)	1.0	10.3	10.9	28.6	17.3
95th Queue (m)	5.2	19.6	20.9	46.5	39.3
Link Distance (m)	7.7	7.7	7.7	37.4	37.4
Upstream Blk Time (%)	5	41	42	2	0
Queuing Penalty (veh)	33	251	260	3	0
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 12: E-N

Movement	WB	WB	WB	WB
Directions Served	T	T	T	R
Maximum Queue (m)	195.6	190.3	157.7	76.7
Average Queue (m)	155.8	139.4	83.5	5.1
95th Queue (m)	206.6	190.7	148.0	55.6
Link Distance (m)	187.5	187.5	187.5	187.5
Upstream Blk Time (%)	6	1	0	0
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 14: S-E

Movement	EB	EB	EB	NB	NB
Directions Served	T	T	T	R	R
Maximum Queue (m)	5.9	12.4	21.4	71.4	59.0
Average Queue (m)	0.3	1.9	8.9	53.3	40.1
95th Queue (m)	2.8	8.2	18.1	71.5	56.0
Link Distance (m)	20.9	20.9	20.9	48.7	48.7
Upstream Blk Time (%)		0	2	10	2
Queuing Penalty (veh)		3	11	29	4
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 16: W-N/East Terminal

Movement	EB	EB	EB
Directions Served	LT	T	T
Maximum Queue (m)	73.4	77.4	76.0
Average Queue (m)	48.6	38.8	31.2
95th Queue (m)	76.0	76.1	72.3
Link Distance (m)	54.6	54.6	54.6
Upstream Blk Time (%)	6	2	3
Queuing Penalty (veh)	53	21	24
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 17: S-W & E-S

Movement	WB	WB	WB	NB	NB
Directions Served	T	T	T	L	L
Maximum Queue (m)	34.3	36.1	32.4	63.8	57.5
Average Queue (m)	17.5	16.8	11.7	53.9	39.8
95th Queue (m)	32.4	35.0	32.5	70.0	59.8
Link Distance (m)	31.8	31.8	31.8	39.6	39.6
Upstream Blk Time (%)	1	1	1	38	15
Queuing Penalty (veh)	5	5	5	89	35
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 5193

Appendix G

2031 Total Synchro Analysis

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	27	1237	365	1993	5	4	152	250	35
v/c Ratio	0.15	0.43	0.69	0.67	0.03	0.04	0.57	0.75	0.05
Control Delay	6.6	4.6	60.9	6.9	31.8	48.2	11.9	52.3	30.2
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	6.6	4.6	60.9	7.0	31.8	48.2	11.9	52.3	30.2
Queue Length 50th (m)	0.4	7.4	43.3	50.0	0.9	0.9	0.0	50.8	2.5
Queue Length 95th (m)	m0.7	9.0	m58.8	62.3	3.9	4.5	11.5	74.6	7.6
Internal Link Dist (m)		85.3		118.2		85.0			175.8
Turn Bay Length (m)	70.0		65.0		20.0			40.0	
Base Capacity (vph)	175	2905	591	2992	191	310	412	332	838
Starvation Cap Reductn	0	0	0	184	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	0.15	0.43	0.62	0.71	0.03	0.01	0.37	0.75	0.04

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)	27	1230	7	365	1666	327	5	4	152	250	27	8
Future Volume (vph)	27	1230	7	365	1666	327	5	4	152	250	27	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0	6.0	4.0	6.0	
Lane Util. Factor	1.00	0.86		0.97	0.91		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.99	1.00	
Frt	1.00	1.00		1.00	0.98		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	6048		3467	4860		1733	1900	1560	1742	3467	
Flt Permitted	0.08	1.00		0.95	1.00		0.73	1.00	1.00	0.53	1.00	
Satd. Flow (perm)	153	6048		3467	4860		1338	1900	1560	978	3467	
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)	27	1230	7	365	1666	327	5	4	152	250	27	8
RTOR Reduction (vph)	0	1	0	0	22	0	0	0	139	0	6	0
Lane Group Flow (vph)	27	1236	0	365	1971	0	5	4	13	250	29	0
Confl. Peds. (#/hr)	2					2	1		7	7		1
Heavy Vehicles (%)	0%	8%	3%	1%	4%	3%	4%	0%	1%	3%	0%	1%
Turn Type	pm+pt	NA		Prot	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2						8		8	4		
Actuated Green, G (s)	53.5	49.7		16.7	62.6		10.7	9.6	9.6	27.6	22.5	
Effective Green, g (s)	53.5	49.7		16.7	62.6		10.7	9.6	9.6	27.6	22.5	
Actuated g/C Ratio	0.49	0.45		0.15	0.57		0.10	0.09	0.09	0.25	0.20	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0	6.0	4.0	6.0	
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)	131	2732		526	2765		134	165	136	342	709	
v/s Ratio Prot	0.01	0.20		c0.11	c0.41		0.00	0.00		c0.09	0.01	
v/s Ratio Perm	0.09						0.00		0.01	c0.09		
v/c Ratio	0.21	0.45		0.69	0.71		0.04	0.02	0.10	0.73	0.04	
Uniform Delay, d1	15.7	20.8		44.2	17.2		45.0	45.9	46.2	36.1	35.1	
Progression Factor	0.64	0.22		1.26	0.40		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.7	0.5		3.1	1.3		0.1	0.1	0.3	7.8	0.0	
Delay (s)	10.7	5.0		58.7	8.2		45.1	46.0	46.5	43.9	35.1	
Level of Service	B	A		E	A		D	D	D	D	D	
Approach Delay (s)		5.1			16.0			46.5			42.9	
Approach LOS		A			B			D			D	

Intersection Summary

HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	1443	188	428	1670	653	688
v/c Ratio	0.70	0.31	0.94	0.56	0.69	0.84
Control Delay	22.2	3.5	46.9	9.3	38.9	43.1
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	22.2	3.5	46.9	9.5	38.9	43.1
Queue Length 50th (m)	90.5	3.4	65.1	83.2	66.7	74.4
Queue Length 95th (m)	83.7	m4.5	#134.0	112.6	83.5	96.6
Internal Link Dist (m)	118.2			168.8		
Turn Bay Length (m)		45.0	135.0		300.0	300.0
Base Capacity (vph)	2076	600	502	3008	1071	916
Starvation Cap Reductn	0	0	0	560	0	0
Spillback Cap Reductn	0	0	0	53	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.31	0.85	0.68	0.61	0.75

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)	0	1443	188	428	1670	0	0	0	0	653	0	688
Future Volume (vph)	0	1443	188	428	1670	0	0	0	0	653	0	688
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	4.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	1.00	0.91					0.97		0.88
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		6225	1538	1626	4940					3367		2733
Flt Permitted		1.00	1.00	0.10	1.00					0.95		1.00
Satd. Flow (perm)		6225	1538	168	4940					3367		2733
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	1443	188	428	1670	0	0	0	0	653	0	688
RTOR Reduction (vph)	0	0	88	0	0	0	0	0	0	0	0	50
Lane Group Flow (vph)	0	1443	100	428	1670	0	0	0	0	653	0	638
Heavy Vehicles (%)	0%	5%	5%	11%	5%	0%	0%	0%	0%	4%	0%	4%
Turn Type		NA	Perm	pm+pt	NA					Prot		Perm
Protected Phases		2		1	6					4		
Permitted Phases			2	6								4
Actuated Green, G (s)		36.7	36.7	67.0	67.0					31.0		31.0
Effective Green, g (s)		36.7	36.7	67.0	67.0					31.0		31.0
Actuated g/C Ratio		0.33	0.33	0.61	0.61					0.28		0.28
Clearance Time (s)		6.0	6.0	4.0	6.0					6.0		6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		3.0
Lane Grp Cap (vph)		2076	513	450	3008					948		770
v/s Ratio Prot		0.23		c0.23	0.34					0.19		
v/s Ratio Perm			0.07	c0.35								c0.23
v/c Ratio		0.70	0.20	0.95	0.56					0.69		0.83
Uniform Delay, d1		31.8	26.1	31.5	12.7					35.2		37.0
Progression Factor		0.60	0.21	0.67	0.65					1.00		1.00
Incremental Delay, d2		1.8	0.8	25.9	0.6					2.1		7.4
Delay (s)		20.8	6.3	47.1	8.8					37.3		44.4
Level of Service		C	A	D	A					D		D
Approach Delay (s)		19.1			16.6			0.0			40.9	
Approach LOS		B			B			A			D	

Intersection Summary

HCM 2000 Control Delay	23.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	299	1797	1657	741	441	233
v/c Ratio	0.67	0.51	0.64	0.67	0.74	0.44
Control Delay	38.2	8.2	5.2	6.2	49.7	29.5
Queue Delay	0.0	0.3	0.0	1.3	0.0	0.0
Total Delay	38.2	8.5	5.2	7.5	49.7	29.5
Queue Length 50th (m)	22.0	106.7	16.5	1.6	49.0	18.5
Queue Length 95th (m)	33.0	121.8	m20.4	m31.3	62.4	30.0
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	499	3556	2601	1114	825	703
Starvation Cap Reductn	0	975	0	185	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.70	0.64	0.80	0.53	0.33

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)	299	1797	0	0	1657	741	441	0	233	0	0	0
Future Volume (vph)	299	1797	0	0	1657	741	441	0	233	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0			6.0	6.0	6.0		6.0			
Lane Util. Factor	0.97	0.91			0.91	1.00	0.97		0.88			
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)	3213	5036			4893	1468	3242		2561			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3213	5036			4893	1468	3242		2561			
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)	299	1797	0	0	1657	741	441	0	233	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	334	0	0	56	0	0	0
Lane Group Flow (vph)	299	1797	0	0	1657	407	441	0	177	0	0	0
Heavy Vehicles (%)	9%	3%	0%	0%	6%	10%	8%	0%	11%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Prot		Perm			
Protected Phases	5	2			6		8					
Permitted Phases						6			8			
Actuated Green, G (s)	15.2	77.7			58.5	58.5	20.3		20.3			
Effective Green, g (s)	15.2	77.7			58.5	58.5	20.3		20.3			
Actuated g/C Ratio	0.14	0.71			0.53	0.53	0.18		0.18			
Clearance Time (s)	4.0	6.0			6.0	6.0	6.0		6.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0			
Lane Grp Cap (vph)	443	3557			2602	780	598		472			
v/s Ratio Prot	c0.09	0.36			c0.34		c0.14					
v/s Ratio Perm						0.28			0.07			
v/c Ratio	0.67	0.51			0.64	0.52	0.74		0.37			
Uniform Delay, d1	45.1	7.4			18.2	16.7	42.3		39.3			
Progression Factor	0.72	0.99			0.24	2.40	1.00		1.00			
Incremental Delay, d2	3.0	0.4			0.5	1.1	4.7		0.5			
Delay (s)	35.6	7.7			4.9	41.1	47.1		39.8			
Level of Service	D	A			A	D	D		D			
Approach Delay (s)		11.7			16.1			44.6			0.0	
Approach LOS		B			B			D			A	

Intersection Summary

HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
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	SBL	SBT	SBR
Lane Group Flow (vph)	327	1503	28	13	2013	96	171	39	43	10	215
v/c Ratio	0.50	0.49	0.03	0.05	0.98	0.14	0.48	0.20	0.29	0.06	0.66
Control Delay	63.7	4.0	0.0	4.5	25.1	0.2	51.0	24.2	51.6	45.6	16.4
Queue Delay	0.0	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.7	4.0	0.0	4.5	28.5	0.2	51.0	24.2	51.6	45.6	16.4
Queue Length 50th (m)	39.8	9.9	0.0	0.4	49.3	0.2	19.2	2.5	9.4	2.2	0.0
Queue Length 95th (m)	55.7	31.9	m0.0	m0.6	m#204.8	m0.0	29.6	12.7	20.1	7.4	22.2
Internal Link Dist (m)		225.6			141.6			127.2		94.6	
Turn Bay Length (m)	160.0		175.0	50.0			50.0		60.0		
Base Capacity (vph)	651	3090	979	258	2045	696	1103	555	147	155	328
Starvation Cap Reductn	0	0	0	0	34	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	0.50	0.49	0.03	0.05	1.00	0.14	0.16	0.07	0.29	0.06	0.66

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)	327	1503	28	13	2013	96	171	12	27	43	10	215
Future Volume (vph)	327	1503	28	13	2013	96	171	12	27	43	10	215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90		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)	3367	4893	1476	1805	4848	1475	3467	1687		1805	1900	1599
Flt Permitted	0.95	1.00	1.00	0.16	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3367	4893	1476	307	4848	1475	3467	1687		1805	1900	1599
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)	327	1503	28	13	2013	96	171	12	27	43	10	215
RTOR Reduction (vph)	0	0	11	0	0	56	0	24	0	0	0	197
Lane Group Flow (vph)	327	1503	17	13	2013	40	171	15	0	43	10	18
Confl. Peds. (#/hr)	2		1	1		2			1	1		
Heavy Vehicles (%)	4%	6%	8%	0%	7%	8%	1%	0%	0%	0%	0%	1%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2	6		6						4
Actuated Green, G (s)	21.3	66.3	66.3	47.8	46.4	46.4	11.3	11.3		9.0	9.0	9.0
Effective Green, g (s)	21.3	66.3	66.3	47.8	46.4	46.4	11.3	11.3		9.0	9.0	9.0
Actuated g/C Ratio	0.19	0.60	0.60	0.43	0.42	0.42	0.10	0.10		0.08	0.08	0.08
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	651	2949	889	152	2044	622	356	173		147	155	130
v/s Ratio Prot	c0.10	0.31		0.00	c0.42		c0.05	0.01		c0.02	0.01	
v/s Ratio Perm			0.01	0.04		0.03						0.01
v/c Ratio	0.50	0.51	0.02	0.09	0.98	0.07	0.48	0.09		0.29	0.06	0.14
Uniform Delay, d1	39.6	12.5	8.8	17.7	31.5	18.9	46.6	44.7		47.5	46.6	46.9
Progression Factor	1.51	0.29	1.00	0.49	0.44	0.05	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	0.6	0.0	0.1	9.0	0.1	1.0	0.2		1.1	0.2	0.5
Delay (s)	60.3	4.2	8.8	8.8	22.9	1.1	47.6	44.9		48.6	46.8	47.4
Level of Service	E	A	A	A	C	A	D	D		D	D	D
Approach Delay (s)		14.2			21.9			47.1			47.5	
Approach LOS		B			C			D			D	

Intersection Summary

HCM 2000 Control Delay	21.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	22.0
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	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	406	876	290	59	1682	104	64	358	176	479
v/c Ratio	0.92	0.39	0.36	0.18	0.96	0.58	0.08	0.83	0.20	0.94
Control Delay	85.2	16.3	3.4	14.9	49.5	64.1	13.2	48.6	30.9	52.5
Queue Delay	0.0	0.0	0.0	0.0	20.4	0.0	0.0	0.0	0.0	0.4
Total Delay	85.2	16.3	3.4	14.9	69.8	64.1	13.2	48.6	30.9	52.9
Queue Length 50th (m)	~58.0	31.0	3.0	6.4	134.3	12.0	1.8	60.2	15.5	68.7
Queue Length 95th (m)	#90.9	30.9	17.7	13.3	#170.0	#21.5	7.1	#107.4	24.7	#132.6
Internal Link Dist (m)		141.6			238.0		219.7		226.0	
Turn Bay Length (m)	70.0		50.0	120.0		95.0		110.0		45.0
Base Capacity (vph)	441	2236	813	319	1745	178	944	432	960	544
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	136	0	0	0	0	4
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.39	0.36	0.18	1.05	0.58	0.07	0.83	0.18	0.89

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)	406	876	290	59	1539	143	104	22	42	358	176	479
Future Volume (vph)	406	876	290	59	1539	143	104	22	42	358	176	479
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3213	4988	1458	1719	4898		3019	3095		1626	3252	1417
Flt Permitted	0.95	1.00	1.00	0.31	1.00		0.95	1.00		0.62	1.00	1.00
Satd. Flow (perm)	3213	4988	1458	564	4898		3019	3095		1054	3252	1417
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)	406	876	290	59	1539	143	104	22	42	358	176	479
RTOR Reduction (vph)	0	0	165	0	10	0	0	32	0	0	0	128
Lane Group Flow (vph)	406	876	125	59	1672	0	104	32	0	358	176	351
Confl. Peds. (#/hr)	1		3	3		1						
Heavy Vehicles (%)	9%	4%	9%	5%	4%	9%	16%	15%	0%	11%	11%	14%
Turn Type	Prot	NA	Perm	pm+pt	NA		Prot	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)	15.1	47.3	47.3	43.4	37.8		6.5	25.3		41.1	30.6	30.6
Effective Green, g (s)	15.1	47.3	47.3	43.4	37.8		6.5	25.3		41.1	30.6	30.6
Actuated g/C Ratio	0.14	0.43	0.43	0.39	0.34		0.06	0.23		0.37	0.28	0.28
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
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)	441	2144	626	281	1683		178	711		455	904	394
v/s Ratio Prot	c0.13	0.18		0.01	c0.34		0.03	0.01		c0.08	0.05	
v/s Ratio Perm			0.09	0.07						0.21		c0.25
v/c Ratio	0.92	0.41	0.20	0.21	0.99		0.58	0.04		0.79	0.19	0.89
Uniform Delay, d1	46.9	21.7	19.5	20.9	36.0		50.4	32.9		29.6	30.3	38.1
Progression Factor	1.30	0.73	0.86	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	25.0	0.5	0.6	0.4	20.5		4.8	0.0		8.7	0.1	20.9
Delay (s)	86.1	16.3	17.4	21.3	56.4		55.3	33.0		38.3	30.4	59.0
Level of Service	F	B	B	C	E		E	C		D	C	E
Approach Delay (s)		34.5			55.3			46.8			46.7	
Approach LOS		C			E			D			D	

Intersection Summary

HCM 2000 Control Delay	45.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	89.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	88	14	6	62	509	7	1007
v/c Ratio	0.26	0.11	0.01	0.16	0.19	0.01	0.45
Control Delay	18.6	36.8	0.0	4.2	5.0	3.6	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.6	36.8	0.0	4.2	5.0	3.6	9.4
Queue Length 50th (m)	2.2	2.4	0.0	2.0	11.1	0.3	46.0
Queue Length 95th (m)	10.4	8.0	0.0	7.5	35.7	1.7	82.8
Internal Link Dist (m)	115.4		50.9		226.0		199.1
Turn Bay Length (m)				70.0		50.0	
Base Capacity (vph)	737	126	737	384	2638	750	2253
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.11	0.01	0.16	0.19	0.01	0.45

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	0	42	14	0	6	62	491	18	7	956	51
Future Volume (vph)	46	0	42	14	0	6	62	491	18	7	956	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor		0.95		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.93		1.00	0.85		1.00	0.99		1.00	0.99	
Flt Protected		0.97		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3130		1203	1615		1517	3394		1805	3186	
Flt Permitted		0.82		0.46	1.00		0.24	1.00		0.46	1.00	
Satd. Flow (perm)		2643		584	1615		376	3394		883	3186	
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	0	42	14	0	6	62	491	18	7	956	51
RTOR Reduction (vph)	0	59	0	0	5	0	0	1	0	0	2	0
Lane Group Flow (vph)	0	29	0	14	1	0	62	508	0	7	1005	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	1%	0%	8%	50%	0%	0%	19%	6%	0%	0%	13%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		7.8		13.1	13.1		77.2	71.9		69.1	67.8	
Effective Green, g (s)		7.8		13.1	13.1		77.2	71.9		69.1	67.8	
Actuated g/C Ratio		0.08		0.13	0.13		0.75	0.70		0.68	0.66	
Clearance Time (s)		6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		201		82	206		343	2385		608	2111	
v/s Ratio Prot				c0.00	0.00		c0.01	0.15		0.00	c0.32	
v/s Ratio Perm		0.01		c0.02			0.13			0.01		
v/c Ratio		0.14		0.17	0.00		0.18	0.21		0.01	0.48	
Uniform Delay, d1		44.1		39.4	38.9		4.1	5.3		5.4	8.5	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3		1.0	0.0		0.3	0.2		0.0	0.8	
Delay (s)		44.5		40.4	38.9		4.3	5.5		5.4	9.3	
Level of Service		D		D	D		A	A		A	A	
Approach Delay (s)		44.5			40.0			5.4			9.2	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	102.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	WBL	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	49	29	5	51	491	5	1034
v/c Ratio	0.23	0.08	0.04	0.11	0.17	0.01	0.43
Control Delay	38.6	0.5	45.0	3.5	4.5	3.6	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.6	0.5	45.0	3.5	4.5	3.6	8.3
Queue Length 50th (m)	8.6	0.0	0.9	1.7	10.7	0.2	47.4
Queue Length 95th (m)	19.2	0.0	4.9	6.3	34.5	1.3	85.1
Internal Link Dist (m)					199.1		252.7
Turn Bay Length (m)	25.0			70.0		70.0	
Base Capacity (vph)	232	427	158	501	2810	809	2406
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.07	0.03	0.10	0.17	0.01	0.43

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	0	29	5	0	0	51	491	0	5	980	54
Future Volume (vph)	49	0	29	5	0	0	51	491	0	5	980	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		6.0	4.0			4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00		1.00	1.00			1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Frt	1.00		0.85	1.00			1.00	1.00		1.00	0.99	
Flt Protected	0.95		1.00	0.95			0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1687		961	1805			1805	3406		1805	3272	
Flt Permitted	0.95		1.00	0.00			0.23	1.00		0.47	1.00	
Satd. Flow (perm)	1687		961	0			439	3406		898	3272	
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	0	29	5	0	0	51	491	0	5	980	54
RTOR Reduction (vph)	0	0	27	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	49	0	2	5	0	0	51	491	0	5	1032	0
Confl. Peds. (#/hr)	1											
Heavy Vehicles (%)	7%	0%	68%	0%	0%	0%	0%	6%	0%	0%	10%	0%
Turn Type	pm+pt		Perm	pm+pt			pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	12.8		5.6	1.2			78.4	73.2		70.0	68.8	
Effective Green, g (s)	12.8		5.6	1.2			78.4	73.2		70.0	68.8	
Actuated g/C Ratio	0.13		0.06	0.01			0.77	0.72		0.69	0.68	
Clearance Time (s)	4.0		6.0	4.0			4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0			3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	213		53	21			415	2463		631	2224	
v/s Ratio Prot	c0.03			0.00			c0.01	0.14		0.00	c0.32	
v/s Ratio Perm			0.00				0.09			0.01		
v/c Ratio	0.23		0.03	0.24			0.12	0.20		0.01	0.46	
Uniform Delay, d1	39.8		45.2	49.5			3.4	4.5		4.8	7.6	
Progression Factor	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6		0.2	5.8			0.1	0.2		0.0	0.7	
Delay (s)	40.3		45.5	55.3			3.6	4.7		4.8	8.3	
Level of Service	D		D	E			A	A		A	A	
Approach Delay (s)		42.2			55.3			4.6			8.3	
Approach LOS		D			E			A			A	

Intersection Summary

HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	101.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	46	27	36	189	31	440	74	1017
v/c Ratio	0.22	0.06	0.13	0.34	0.14	0.21	0.12	0.49
Control Delay	35.2	0.3	33.7	1.7	6.6	10.8	5.7	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	0.3	33.7	1.7	6.6	10.8	5.7	12.8
Queue Length 50th (m)	7.9	0.0	6.1	0.0	1.8	22.8	4.4	66.0
Queue Length 95th (m)	18.0	0.0	15.0	0.0	4.9	33.5	9.2	88.5
Internal Link Dist (m)				203.0		252.7		204.9
Turn Bay Length (m)	50.0	50.0	30.0		70.0		65.0	
Base Capacity (vph)	226	583	278	663	246	2047	645	2062
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	0.05	0.13	0.29	0.13	0.21	0.11	0.49

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	0	27	36	0	189	31	439	1	74	976	41
Future Volume (vph)	46	0	27	36	0	189	31	439	1	74	976	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00		1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00		0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00		0.85	1.00	0.85		1.00	1.00		1.00	0.99	
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805		1593	1734	1346		1031	3404		1624	3301	
Flt Permitted	0.32		1.00	0.76	1.00		0.24	1.00		0.48	1.00	
Satd. Flow (perm)	603		1593	1382	1346		256	3404		825	3301	
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	0	27	36	0	189	31	439	1	74	976	41
RTOR Reduction (vph)	0	0	24	0	169	0	0	0	0	0	2	0
Lane Group Flow (vph)	46	0	3	36	20	0	31	440	0	74	1015	0
Confl. Peds. (#/hr)			1	1			5		4	4		5
Heavy Vehicles (%)	0%	0%	0%	4%	0%	20%	75%	6%	4%	11%	9%	0%
Turn Type	pm+pt		Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	18.7		12.6	15.3	10.9		65.7	61.5		68.7	63.0	
Effective Green, g (s)	18.7		12.6	15.3	10.9		65.7	61.5		68.7	63.0	
Actuated g/C Ratio	0.18		0.12	0.15	0.10		0.63	0.59		0.66	0.60	
Clearance Time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	178		192	217	140		192	2009		587	1995	
v/s Ratio Prot	c0.02			0.01	0.01		0.01	0.13		c0.01	c0.31	
v/s Ratio Perm	c0.03		0.00	0.02			0.09			0.08		
v/c Ratio	0.26		0.02	0.17	0.14		0.16	0.22		0.13	0.51	
Uniform Delay, d1	36.2		40.3	38.7	42.4		7.9	10.0		6.4	11.8	
Progression Factor	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8		0.0	0.4	0.5		0.4	0.3		0.1	0.9	
Delay (s)	37.0		40.4	39.1	42.9		8.3	10.3		6.5	12.7	
Level of Service	D		D	D	D		A	B		A	B	
Approach Delay (s)		38.2			42.3			10.2			12.3	
Approach LOS		D			D			B			B	

Intersection Summary

HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	104.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	0	3	14	0	6	9	595	54	14	911	26
Future Volume (Veh/h)	6	0	3	14	0	6	9	595	54	14	911	26
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	6	0	3	14	0	6	9	595	54	14	911	26
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								229				
pX, platoon unblocked	0.97	0.97		0.97	0.97	0.97				0.97		
vC, conflicting volume	1274	1619	468	1126	1605	324	937			649		
vC1, stage 1 conf vol	952	952		640	640							
vC2, stage 2 conf vol	322	667		486	965							
vCu, unblocked vol	1224	1579	468	1072	1565	247	937			581		
tC, single (s)	7.5	6.5	6.9	8.3	6.5	6.9	4.1			4.2		
tC, 2 stage (s)	6.5	5.5		7.3	5.5							
tF (s)	3.5	4.0	3.3	3.9	4.0	3.3	2.2			2.3		
p0 queue free %	98	100	99	95	100	99	99			99		
cM capacity (veh/h)	261	278	541	298	275	738	727			935		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	9	20	9	397	252	14	607	330
Volume Left	6	14	9	0	0	14	0	0
Volume Right	3	6	0	0	54	0	0	26
cSH	315	363	727	1700	1700	935	1700	1700
Volume to Capacity	0.03	0.06	0.01	0.23	0.15	0.01	0.36	0.19
Queue Length 95th (m)	0.7	1.4	0.3	0.0	0.0	0.4	0.0	0.0
Control Delay (s)	16.8	15.5	10.0	0.0	0.0	8.9	0.0	0.0
Lane LOS	C	C	B			A		
Approach Delay (s)	16.8	15.5	0.1			0.1		
Approach LOS	C	C						

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	36.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	27	25	102	503	926	113
Future Volume (Veh/h)	27	25	102	503	926	113
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	27	25	102	503	926	113
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)					276	
pX, platoon unblocked	0.98	0.98	0.98			
vC, conflicting volume	1438	520	1039			
vC1, stage 1 conf vol	982					
vC2, stage 2 conf vol	456					
vCu, unblocked vol	1413	480	1008			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	91	95	85			
cM capacity (veh/h)	292	529	685			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	27	25	102	252	252	617	422
Volume Left	27	0	102	0	0	0	0
Volume Right	0	25	0	0	0	0	113
cSH	292	529	685	1700	1700	1700	1700
Volume to Capacity	0.09	0.05	0.15	0.15	0.15	0.36	0.25
Queue Length 95th (m)	2.4	1.2	4.2	0.0	0.0	0.0	0.0
Control Delay (s)	18.6	12.1	11.2	0.0	0.0	0.0	0.0
Lane LOS	C	B	B				
Approach Delay (s)	15.5		1.9			0.0	
Approach LOS	C						

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	48.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	6	25	494	1020	26
Future Volume (Veh/h)	9	6	25	494	1020	26
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	9	6	25	494	1020	26
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)					122	
pX, platoon unblocked	0.95	0.95	0.95			
vC, conflicting volume	1330	523	1046			
vC1, stage 1 conf vol	1033					
vC2, stage 2 conf vol	297					
vCu, unblocked vol	1249	403	952			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	99	96			
cM capacity (veh/h)	310	575	696			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	15	25	247	247	680	366
Volume Left	9	25	0	0	0	0
Volume Right	6	0	0	0	0	26
cSH	380	696	1700	1700	1700	1700
Volume to Capacity	0.04	0.04	0.15	0.15	0.40	0.22
Queue Length 95th (m)	1.0	0.9	0.0	0.0	0.0	0.0
Control Delay (s)	14.9	10.4	0.0	0.0	0.0	0.0
Lane LOS	B	B				
Approach Delay (s)	14.9	0.5			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	39.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	136	636	408	395	634	232	111	384	51	241	288
v/c Ratio	0.38	0.60	0.65	0.81	0.45	0.31	0.30	0.41	0.16	0.28	0.56
Control Delay	17.2	36.0	21.5	29.8	24.1	8.0	27.7	35.1	25.7	35.1	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
Total Delay	17.2	36.0	21.5	29.8	24.1	8.0	27.7	35.1	25.7	35.1	9.0
Queue Length 50th (m)	14.5	64.1	37.6	50.0	54.0	10.1	16.8	37.4	7.4	23.1	0.0
Queue Length 95th (m)	24.5	93.0	80.9	81.0	69.6	26.3	33.5	57.6	17.8	37.9	25.6
Internal Link Dist (m)		842.4			279.6			97.5		104.6	
Turn Bay Length (m)	25.0		25.0	40.0		25.0	100.0		40.0		50.0
Base Capacity (vph)	367	1066	628	581	1644	837	371	936	324	875	512
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	0.37	0.60	0.65	0.68	0.39	0.28	0.30	0.41	0.16	0.28	0.56

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	136	636	408	395	634	232	111	337	47	51	241	288
Future Volume (vph)	136	636	408	395	634	232	111	337	47	51	241	288
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
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)	1641	3406	1538	1736	3343	1538	1595	3310		1610	3374	1151
Flt Permitted	0.41	1.00	1.00	0.25	1.00	1.00	0.57	1.00		0.48	1.00	1.00
Satd. Flow (perm)	710	3406	1538	448	3343	1538	953	3310		806	3374	1151
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)	136	636	408	395	634	232	111	337	47	51	241	288
RTOR Reduction (vph)	0	0	147	0	0	92	0	9	0	0	0	212
Lane Group Flow (vph)	136	636	261	395	634	140	111	375	0	51	241	76
Confl. Peds. (#/hr)							3		2	2		3
Heavy Vehicles (%)	10%	6%	5%	4%	8%	5%	13%	7%	6%	12%	7%	38%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	43.7	35.1	35.1	59.9	47.3	47.3	38.4	31.4		35.4	29.9	29.9
Effective Green, g (s)	43.7	35.1	35.1	59.9	47.3	47.3	38.4	31.4		35.4	29.9	29.9
Actuated g/C Ratio	0.39	0.31	0.31	0.53	0.42	0.42	0.34	0.28		0.31	0.27	0.27
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	6.0
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)	346	1059	478	475	1401	644	364	921		292	894	305
v/s Ratio Prot	0.03	0.19		c0.15	0.19		c0.02	c0.11		0.01	0.07	
v/s Ratio Perm	0.12		0.17	c0.29		0.09	0.08			0.05		0.07
v/c Ratio	0.39	0.60	0.55	0.83	0.45	0.22	0.30	0.41		0.17	0.27	0.25
Uniform Delay, d1	23.1	32.9	32.2	18.4	23.5	20.9	26.4	33.1		27.5	32.8	32.6
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	0.7	1.0	1.3	11.8	0.2	0.2	0.5	1.3		0.3	0.7	2.0
Delay (s)	23.8	33.9	33.5	30.2	23.7	21.1	26.9	34.5		27.7	33.5	34.6
Level of Service	C	C	C	C	C	C	C	C		C	C	C
Approach Delay (s)		32.6			25.2			32.8			33.6	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	112.8	Sum of lost time (s)	20.0
Intersection Capacity Utilization	93.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	41	1323	373	1307	94	52	29	172
v/c Ratio	0.14	0.59	0.75	0.41	0.44	0.14	0.13	0.43
Control Delay	9.1	24.6	50.8	5.9	43.5	22.4	36.1	20.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.1	24.6	50.8	5.9	43.5	22.4	36.1	20.3
Queue Length 50th (m)	2.4	82.1	67.6	16.7	17.8	1.7	5.3	6.0
Queue Length 95th (m)	5.6	109.4	101.0	30.8	32.9	8.0	13.4	16.9
Internal Link Dist (m)		279.4		63.9		107.8		187.7
Turn Bay Length (m)	60.0		25.0		45.0		50.0	
Base Capacity (vph)	305	2251	513	3178	216	751	223	871
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	0.13	0.59	0.73	0.41	0.44	0.07	0.13	0.20

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	1198	125	373	1225	82	94	16	36	29	54	118
Future Volume (vph)	41	1198	125	373	1225	82	94	16	36	29	54	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.90		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	4875		1752	4850		1656	2953		1570	3188	
Flt Permitted	0.20	1.00		0.12	1.00		0.56	1.00		0.72	1.00	
Satd. Flow (perm)	378	4875		221	4850		979	2953		1192	3188	
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)	41	1198	125	373	1225	82	94	16	36	29	54	118
RTOR Reduction (vph)	0	9	0	0	5	0	0	32	0	0	106	0
Lane Group Flow (vph)	41	1314	0	373	1302	0	94	20	0	29	66	0
Confl. Peds. (#/hr)			5	5								
Heavy Vehicles (%)	0%	5%	2%	3%	6%	5%	9%	4%	12%	15%	5%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	53.1	48.9		76.9	68.7		18.7	12.6		15.5	11.0	
Effective Green, g (s)	53.1	48.9		76.9	68.7		18.7	12.6		15.5	11.0	
Actuated g/C Ratio	0.48	0.44		0.70	0.62		0.17	0.11		0.14	0.10	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	236	2167		488	3029		203	338		183	318	
v/s Ratio Prot	0.01	0.27		c0.17	0.27		c0.03	0.01		0.01	0.02	
v/s Ratio Perm	0.08			c0.37			c0.05			0.02		
v/c Ratio	0.17	0.61		0.76	0.43		0.46	0.06		0.16	0.21	
Uniform Delay, d1	15.1	23.2		23.3	10.6		40.2	43.4		41.4	45.5	
Progression Factor	1.00	1.00		2.24	0.55		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	1.3		5.3	0.3		1.7	0.1		0.4	0.3	
Delay (s)	15.4	24.5		57.4	6.2		41.9	43.5		41.8	45.8	
Level of Service	B	C		E	A		D	D		D	D	
Approach Delay (s)		24.2			17.6			42.4			45.2	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	23.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	77.5%	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)	9	570	11	78	367	159	15	110	105	136	270	87
v/c Ratio	0.02	0.35	0.02	0.24	0.23	0.20	0.03	0.07	0.14	0.24	0.17	0.12
Control Delay	18.3	22.1	1.9	22.7	20.4	3.5	19.1	19.2	4.1	22.1	20.3	4.4
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	18.3	22.1	1.9	22.7	20.4	3.5	19.1	19.2	4.1	22.1	20.3	4.4
Queue Length 50th (m)	1.2	47.3	0.0	11.6	28.4	0.0	2.0	8.0	0.0	20.5	20.6	0.0
Queue Length 95th (m)	4.4	61.4	1.4	23.5	39.2	12.2	6.3	13.7	10.2	35.2	29.7	9.4
Internal Link Dist (m)		263.0			842.4			272.7			130.1	
Turn Bay Length (m)	60.0		60.0	60.0		60.0	60.0		60.0	60.0		60.0
Base Capacity (vph)	435	1607	733	322	1607	805	485	1577	763	566	1577	753
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	0.02	0.35	0.02	0.24	0.23	0.20	0.03	0.07	0.14	0.24	0.17	0.12

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	570	11	78	367	159	15	110	105	136	270	87
Future Volume (vph)	9	570	11	78	367	159	15	110	105	136	270	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	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)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.51	1.00	1.00	0.38	1.00	1.00	0.59	1.00	1.00	0.68	1.00	1.00
Satd. Flow (perm)	959	3539	1583	709	3539	1583	1091	3539	1583	1271	3539	1583
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)	9	570	11	78	367	159	15	110	105	136	270	87
RTOR Reduction (vph)	0	0	6	0	0	87	0	0	58	0	0	48
Lane Group Flow (vph)	9	570	5	78	367	72	15	110	47	136	270	39
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	54.5	54.5	54.5	54.5	54.5	54.5	53.5	53.5	53.5	53.5	53.5	53.5
Effective Green, g (s)	54.5	54.5	54.5	54.5	54.5	54.5	53.5	53.5	53.5	53.5	53.5	53.5
Actuated g/C Ratio	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Grp Cap (vph)	435	1607	718	322	1607	718	486	1577	705	566	1577	705
v/s Ratio Prot		c0.16			0.10			0.03			0.08	
v/s Ratio Perm	0.01		0.00	0.11		0.05	0.01		0.03	c0.11		0.02
v/c Ratio	0.02	0.35	0.01	0.24	0.23	0.10	0.03	0.07	0.07	0.24	0.17	0.06
Uniform Delay, d1	18.0	21.3	17.9	20.1	19.9	18.7	18.7	19.0	19.0	20.6	19.9	18.9
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	0.1	0.6	0.0	1.8	0.3	0.3	0.1	0.1	0.2	1.0	0.2	0.1
Delay (s)	18.1	21.9	18.0	21.9	20.3	19.0	18.8	19.1	19.2	21.6	20.2	19.0
Level of Service	B	C	B	C	C	B	B	B	B	C	C	B
Approach Delay (s)		21.8			20.1			19.1			20.4	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	B38	B38	B38	WB	WB	WB	WB
Directions Served	L	T	T	T	TR	T	T	T	L	L	T	T
Maximum Queue (m)	28.7	67.9	72.2	56.2	47.9	10.1	10.5	9.7	48.8	60.5	63.6	76.4
Average Queue (m)	7.5	23.3	29.2	18.7	17.5	0.3	0.3	0.3	30.6	38.5	29.4	36.6
95th Queue (m)	23.3	60.3	66.4	52.1	39.9	7.1	7.4	6.8	46.1	53.3	53.7	65.1
Link Distance (m)		86.5	86.5	86.5	86.5	66.0	66.0	66.0			114.0	114.0
Upstream Blk Time (%)		1	1	0								
Queuing Penalty (veh)		2	2	0								
Storage Bay Dist (m)	70.0								65.0	65.0		
Storage Blk Time (%)		1								0	0	
Queuing Penalty (veh)		0								1	1	

Intersection: 3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

Movement	WB	NB	NB	NB	SB	SB	SB
Directions Served	TR	L	T	R	L	T	TR
Maximum Queue (m)	82.2	8.8	11.2	42.1	47.4	101.6	48.9
Average Queue (m)	47.6	1.7	1.4	18.8	39.8	29.0	6.0
95th Queue (m)	75.1	7.1	6.7	33.5	54.1	90.5	27.5
Link Distance (m)	114.0		85.8	85.8		180.4	180.4
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)		20.0			40.0		
Storage Blk Time (%)			0		27	0	
Queuing Penalty (veh)			0		4	1	

Intersection: 6: Mapleview Drive W & Highway 400 SB Off-Ramp

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	T	R	L	T	T	T	L	L	R
Maximum Queue (m)	119.6	119.2	106.4	95.0	63.4	124.2	106.6	89.2	73.6	233.3	239.8	182.4
Average Queue (m)	67.0	75.3	56.6	46.0	16.3	57.2	37.1	31.7	42.0	138.8	157.7	67.4
95th Queue (m)	124.1	123.4	103.3	87.7	53.9	108.1	71.8	60.7	66.5	262.0	269.7	159.9
Link Distance (m)	114.0	114.0	114.0	114.0			168.4	168.4	168.4		326.9	326.9
Upstream Blk Time (%)	2	3	1	0			0	0				
Queuing Penalty (veh)	9	11	2	1			1	0				
Storage Bay Dist (m)					45.0	135.0				300.0		
Storage Blk Time (%)				10	0	1	0				0	
Queuing Penalty (veh)				19	0	5	0				0	

Intersection: 6: Mapleview Drive W & Highway 400 SB Off-Ramp

Movement	SB
Directions Served	R
Maximum Queue (m)	170.0
Average Queue (m)	53.7
95th Queue (m)	133.8
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	300.0
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (m)	64.5	62.2	112.8	67.1	80.8	104.0	48.2	48.9	87.4	80.0	75.5	52.5
Average Queue (m)	24.6	26.2	24.9	18.7	21.7	43.5	19.3	24.4	42.5	44.6	40.0	24.2
95th Queue (m)	48.5	51.5	80.7	58.2	65.6	89.6	38.4	41.9	70.5	70.5	65.7	42.9
Link Distance (m)		168.4	168.4	168.4	168.4	218.3	218.3	218.3			335.8	335.8
Upstream Blk Time (%)			0									
Queuing Penalty (veh)			0									
Storage Bay Dist (m)	130.0								130.0	265.0		
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	NB
Directions Served	R
Maximum Queue (m)	39.1
Average Queue (m)	9.6
95th Queue (m)	27.8
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	265.0
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	L
Maximum Queue (m)	58.3	63.2	71.0	46.0	57.6	9.4	21.6	125.0	126.9	141.1	159.6	44.2
Average Queue (m)	32.9	37.9	33.0	24.8	35.5	1.3	2.7	55.4	68.1	89.5	28.5	11.6
95th Queue (m)	51.2	55.7	57.8	40.0	53.3	6.3	12.5	95.2	124.3	137.7	109.4	28.1
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)								0	0	2	1	
Queuing Penalty (veh)								0	0	9	7	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)								16				
Queuing Penalty (veh)								2				

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R
Maximum Queue (m)	53.5	24.6	30.1	10.5	55.0
Average Queue (m)	23.7	6.3	10.7	2.3	25.9
95th Queue (m)	43.2	15.5	24.0	8.4	46.2
Link Distance (m)	128.7	128.7		96.0	96.0
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)			60.0		
Storage Blk Time (%)	0				
Queuing Penalty (veh)	0				

Intersection: 15: Bayview Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	T	R	L	T	T	TR	L	L
Maximum Queue (m)	70.3	72.0	26.2	34.1	37.9	47.0	121.8	251.2	257.4	261.6	41.4	51.4
Average Queue (m)	41.6	42.8	8.4	14.8	18.6	17.6	12.3	200.6	248.1	252.3	10.5	22.2
95th Queue (m)	61.7	64.0	21.5	28.9	33.6	37.3	50.0	305.5	261.2	258.6	29.3	44.8
Link Distance (m)			131.2	131.2	131.2			244.4	244.4	244.4		
Upstream Blk Time (%)								6	40	88		
Queuing Penalty (veh)								0	0	0		
Storage Bay Dist (m)	70.0	70.0				50.0	120.0				95.0	95.0
Storage Blk Time (%)	1	1			0	0		6				
Queuing Penalty (veh)	2	3			0	1		4				

Intersection: 15: Bayview Drive & Mapleview Drive W

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	TR	L	T	T	R
Maximum Queue (m)	18.9	22.4	117.5	219.4	201.4	80.0
Average Queue (m)	4.6	6.1	113.7	180.5	63.1	41.3
95th Queue (m)	13.6	15.4	135.4	284.7	171.8	91.2
Link Distance (m)	218.2	218.2		214.5	214.5	
Upstream Blk Time (%)				29	0	
Queuing Penalty (veh)				147	0	
Storage Bay Dist (m)			110.0			45.0
Storage Blk Time (%)			75	3	1	12
Queuing Penalty (veh)			66	11	5	11

Intersection: 18: Bayview Drive & South Village Way/Barrie Molson Centre D/W

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	27.0	35.6	31.5	9.1	31.2	43.3	45.8	29.2	148.9	164.4
Average Queue (m)	11.6	11.5	10.1	1.2	11.6	12.3	13.3	3.2	83.0	82.3
95th Queue (m)	24.0	33.3	35.1	6.3	26.4	34.1	34.6	20.5	196.0	188.8
Link Distance (m)	126.0	126.0	60.2	60.2		214.5	214.5		195.2	195.2
Upstream Blk Time (%)			4						12	6
Queuing Penalty (veh)			0						62	29
Storage Bay Dist (m)					70.0			50.0		
Storage Blk Time (%)									36	
Queuing Penalty (veh)									3	

Intersection: 21: Bayview Drive & North Village Way/Private D/W

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	L	T	TR	L	T	TR
Maximum Queue (m)	25.2	38.2	12.8	20.5	32.8	38.6	47.9	147.9	156.9
Average Queue (m)	9.9	11.6	2.2	7.3	7.9	9.7	4.0	63.1	68.9
95th Queue (m)	20.8	30.7	8.9	15.9	23.8	27.2	30.9	204.8	207.8
Link Distance (m)		71.5	75.9		195.2	195.2		247.7	247.7
Upstream Blk Time (%)								6	7
Queuing Penalty (veh)								29	35
Storage Bay Dist (m)	25.0			70.0			70.0		
Storage Blk Time (%)	1							18	
Queuing Penalty (veh)	0							1	

Intersection: 24: Bayview Drive & Concert Way/Churchill Drive

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	23.0	15.6	27.3	46.3	37.5	40.5	50.5	54.1	133.8	143.8
Average Queue (m)	10.2	5.0	7.8	20.5	9.3	11.9	12.1	15.8	50.8	58.6
95th Queue (m)	20.4	12.9	19.9	35.4	25.5	31.6	33.5	50.8	148.6	153.1
Link Distance (m)				212.1		247.7	247.7		206.7	206.7
Upstream Blk Time (%)									4	5
Queuing Penalty (veh)									20	22
Storage Bay Dist (m)	50.0	50.0	30.0		70.0			65.0		
Storage Blk Time (%)			0	1					11	
Queuing Penalty (veh)			0	1					8	

Intersection: 28: Bayview Drive & Industrial Site D/W South/Coca-Cola D/W

Movement	EB	WB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	TR	L	T	TR
Maximum Queue (m)	9.1	25.4	8.3	1.0	13.7	67.3	71.1
Average Queue (m)	2.7	6.2	1.1	0.0	1.5	9.2	9.9
95th Queue (m)	9.2	19.2	5.7	0.7	7.6	62.9	66.1
Link Distance (m)	149.4	182.1		206.7		206.3	206.3
Upstream Blk Time (%)						0	0
Queuing Penalty (veh)						1	1
Storage Bay Dist (m)			15.0		15.0		
Storage Blk Time (%)					0	7	
Queuing Penalty (veh)					0	1	

Intersection: 29: Bayview Drive & Medical Centre South D/W - Industrial Site D/W North

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	TR
Maximum Queue (m)	20.6	14.4	21.6	35.7	10.1	15.3
Average Queue (m)	8.1	5.1	11.3	2.2	0.3	1.2
95th Queue (m)	17.6	13.0	20.0	17.3	6.0	8.2
Link Distance (m)	102.1	102.1		206.3	137.8	137.8
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			15.0			
Storage Blk Time (%)			5	0		
Queuing Penalty (veh)			13	0		

Intersection: 31: Bayview Drive & Medical Centre North D/W

Movement	EB	NB	NB
Directions Served	LR	L	T
Maximum Queue (m)	14.3	11.6	1.8
Average Queue (m)	4.1	4.1	0.1
95th Queue (m)	12.1	11.7	1.3
Link Distance (m)	108.5		137.8
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)		15.0	
Storage Blk Time (%)		0	
Queuing Penalty (veh)		0	

Intersection: 33: Bayview Drive & Big Bay Point Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	TR	L
Maximum Queue (m)	74.9	117.7	120.9	75.0	94.0	101.6	81.7	42.1	66.1	84.9	77.5	30.2
Average Queue (m)	28.8	57.2	60.4	46.7	59.8	47.1	41.7	14.6	22.2	48.2	29.9	10.9
95th Queue (m)	62.1	92.0	97.5	83.4	93.1	78.9	67.3	28.2	45.2	76.4	67.6	23.9
Link Distance (m)		833.7	833.7			287.9	287.9			92.4	92.4	
Upstream Blk Time (%)									0	0	0	
Queuing Penalty (veh)									0	0	0	
Storage Bay Dist (m)	25.0			25.0	40.0			25.0	100.0			40.0
Storage Blk Time (%)	7	39	39	22	27	9	20	1	0	0		0
Queuing Penalty (veh)	24	53	160	69	86	34	46	2	0	0		0

Intersection: 33: Bayview Drive & Big Bay Point Road

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (m)	56.3	76.4	68.7
Average Queue (m)	27.9	21.7	36.4
95th Queue (m)	47.5	51.4	62.6
Link Distance (m)	101.3	101.3	
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		0	
Storage Bay Dist (m)			50.0
Storage Blk Time (%)	3	0	4
Queuing Penalty (veh)	2	0	5

Intersection: 39: Bryne Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	B38	B38	B38	NB
Directions Served	L	T	T	TR	L	T	T	TR	T	T	T	L
Maximum Queue (m)	27.8	92.2	103.2	101.0	32.3	88.4	65.8	48.3	30.3	1.1	3.2	39.6
Average Queue (m)	9.0	48.9	60.5	55.7	31.2	54.3	33.4	29.6	1.7	0.0	0.1	20.0
95th Queue (m)	25.2	80.9	92.7	91.8	35.6	96.8	60.9	46.5	12.1	0.8	2.2	34.7
Link Distance (m)		286.7	286.7	286.7		66.0	66.0	66.0	86.5	86.5	86.5	
Upstream Blk Time (%)						10	0					
Queuing Penalty (veh)						58	1					
Storage Bay Dist (m)	60.0				25.0							45.0
Storage Blk Time (%)		3			45	1						0
Queuing Penalty (veh)		1			183	5						0

Intersection: 39: Bryne Drive & Mapleview Drive W

Movement	NB	NB	SB	SB	SB
Directions Served	T	TR	L	T	TR
Maximum Queue (m)	14.1	18.4	22.3	34.3	36.9
Average Queue (m)	3.7	5.0	7.7	15.6	14.3
95th Queue (m)	11.1	12.6	18.7	29.4	28.7
Link Distance (m)	103.6	103.6		194.0	194.0
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)			50.0		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 43: Byrne Road/Bryne Road & Harvie Road/Big Bay Point Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	R
Maximum Queue (m)	12.9	66.2	61.0	10.2	40.7	48.6	50.9	29.9	15.5	23.1	10.7	20.2
Average Queue (m)	2.0	39.8	34.2	2.0	15.8	21.6	25.9	12.1	4.2	12.2	2.7	7.8
95th Queue (m)	8.5	59.5	57.2	8.2	33.4	39.5	43.9	22.5	12.3	21.8	8.9	15.6
Link Distance (m)		270.7	270.7			833.7	833.7			277.4	277.4	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	60.0			60.0	60.0			60.0	60.0			60.0
Storage Blk Time (%)		1	0			0	0					
Queuing Penalty (veh)		0	0			0	0					

Intersection: 43: Byrne Road/Bryne Road & Harvie Road/Big Bay Point Road

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (m)	44.8	51.4	42.8	15.5
Average Queue (m)	23.0	28.4	13.6	5.9
95th Queue (m)	38.1	46.8	30.4	12.7
Link Distance (m)		134.8	134.8	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)	60.0			60.0
Storage Blk Time (%)		0		
Queuing Penalty (veh)		0		

Network Summary

Network wide Queuing Penalty: 1284

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	299	1797	1657	741	441	233
v/c Ratio	0.67	0.51	0.64	0.50	0.74	0.44
Control Delay	38.5	8.1	5.3	3.4	49.7	29.5
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	38.5	8.4	5.3	3.4	49.7	29.5
Queue Length 50th (m)	21.9	105.6	16.5	1.5	49.0	18.5
Queue Length 95th (m)	33.6	121.6	m21.5	m39.1	62.4	30.0
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	499	3556	2601	1468	825	703
Starvation Cap Reductn	0	958	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	0.60	0.69	0.64	0.50	0.53	0.33

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)	299	1797	0	0	1657	741	441	0	233	0	0	0
Future Volume (vph)	299	1797	0	0	1657	741	441	0	233	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0			6.0	4.0	6.0		6.0			
Lane Util. Factor	0.97	0.91			0.91	1.00	0.97		0.88			
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)	3213	5036			4893	1468	3242		2561			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3213	5036			4893	1468	3242		2561			
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)	299	1797	0	0	1657	741	441	0	233	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	56	0	0	0
Lane Group Flow (vph)	299	1797	0	0	1657	741	441	0	177	0	0	0
Heavy Vehicles (%)	9%	3%	0%	0%	6%	10%	8%	0%	11%	0%	0%	0%
Turn Type	Prot	NA			NA	Free	Prot		Perm			
Protected Phases	5	2			6		8					
Permitted Phases						Free			8			
Actuated Green, G (s)	15.2	77.7			58.5	110.0	20.3		20.3			
Effective Green, g (s)	15.2	77.7			58.5	110.0	20.3		20.3			
Actuated g/C Ratio	0.14	0.71			0.53	1.00	0.18		0.18			
Clearance Time (s)	4.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)	443	3557			2602	1468	598		472			
v/s Ratio Prot	c0.09	0.36			c0.34		c0.14					
v/s Ratio Perm						0.50			0.07			
v/c Ratio	0.67	0.51			0.64	0.50	0.74		0.37			
Uniform Delay, d1	45.1	7.4			18.2	0.0	42.3		39.3			
Progression Factor	0.73	0.98			0.24	1.00	1.00		1.00			
Incremental Delay, d2	3.0	0.4			0.7	0.7	4.7		0.5			
Delay (s)	35.8	7.6			5.0	0.7	47.1		39.8			
Level of Service	D	A			A	A	D		D			
Approach Delay (s)		11.6			3.7			44.6			0.0	
Approach LOS		B			A			D			A	

Intersection Summary

HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	75.9%	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)	327	1503	28	13	2013	96	171	39	43	10	215
v/c Ratio	0.50	0.46	0.03	0.05	0.92	0.13	0.48	0.20	0.31	0.07	0.34
Control Delay	62.6	4.0	0.0	4.2	18.0	0.2	51.0	24.2	53.6	47.1	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.6	4.0	0.0	4.2	18.7	0.2	51.0	24.2	53.6	47.1	5.2
Queue Length 50th (m)	39.8	11.0	0.0	0.4	48.7	0.2	19.2	2.5	9.4	2.2	0.0
Queue Length 95th (m)	55.6	32.6	m0.0	m0.6	m#193.9	m0.0	29.6	12.7	20.8	7.6	16.5
Internal Link Dist (m)		225.6			141.6			127.2		94.6	
Turn Bay Length (m)	160.0		175.0	50.0			50.0		60.0		
Base Capacity (vph)	651	3233	1018	267	2186	735	1103	555	137	144	631
Starvation Cap Reductn	0	0	0	0	38	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	0.50	0.46	0.03	0.05	0.94	0.13	0.16	0.07	0.31	0.07	0.34

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)	327	1503	28	13	2013	96	171	12	27	43	10	215
Future Volume (vph)	327	1503	28	13	2013	96	171	12	27	43	10	215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90		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)	3367	4893	1476	1805	4848	1475	3467	1687		1805	1900	1599
Flt Permitted	0.95	1.00	1.00	0.16	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3367	4893	1476	307	4848	1475	3467	1687		1805	1900	1599
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)	327	1503	28	13	2013	96	171	12	27	43	10	215
RTOR Reduction (vph)	0	0	11	0	0	54	0	24	0	0	0	160
Lane Group Flow (vph)	327	1503	17	13	2013	42	171	15	0	43	10	55
Confl. Peds. (#/hr)	2		1	1		2			1	1		
Heavy Vehicles (%)	4%	6%	8%	0%	7%	8%	1%	0%	0%	0%	0%	1%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases			2	6		6						4
Actuated Green, G (s)	21.3	68.3	68.3	49.8	48.4	48.4	11.3	11.3		7.0	7.0	28.3
Effective Green, g (s)	21.3	68.3	68.3	49.8	48.4	48.4	11.3	11.3		7.0	7.0	28.3
Actuated g/C Ratio	0.19	0.62	0.62	0.45	0.44	0.44	0.10	0.10		0.06	0.06	0.26
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0
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)	651	3038	916	158	2133	649	356	173		114	120	411
v/s Ratio Prot	c0.10	0.31		0.00	c0.42		c0.05	0.01		c0.02	0.01	0.03
v/s Ratio Perm			0.01	0.04		0.03						0.01
v/c Ratio	0.50	0.49	0.02	0.08	0.94	0.07	0.48	0.09		0.38	0.08	0.13
Uniform Delay, d1	39.6	11.4	8.0	16.6	29.5	17.8	46.6	44.7		49.4	48.5	31.4
Progression Factor	1.48	0.33	1.00	0.49	0.44	0.06	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	0.5	0.0	0.1	4.7	0.1	1.0	0.2		2.1	0.3	0.1
Delay (s)	59.2	4.3	8.0	8.2	17.7	1.1	47.6	44.9		51.5	48.8	31.6
Level of Service	E	A	A	A	B	A	D	D		D	D	C
Approach Delay (s)		14.0			16.9			47.1			35.4	
Approach LOS		B			B			D			D	

Intersection Summary

HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (m)	50.1	81.1	139.0	83.5	78.9	98.0	62.9	65.5	36.4	73.5	76.4	58.6
Average Queue (m)	22.4	26.5	27.2	17.1	20.4	38.6	20.6	25.7	3.8	42.1	41.8	25.0
95th Queue (m)	42.2	63.2	93.1	55.7	60.3	73.7	42.6	46.1	19.5	67.7	69.0	46.1
Link Distance (m)		168.4	168.4	168.4	168.4	218.3	218.3	218.3			335.8	335.8
Upstream Blk Time (%)		0	0									
Queuing Penalty (veh)		0	1									
Storage Bay Dist (m)	130.0								130.0	265.0		
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	NB
Directions Served	R
Maximum Queue (m)	49.6
Average Queue (m)	10.9
95th Queue (m)	31.9
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	265.0
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	L
Maximum Queue (m)	55.3	59.0	62.6	44.6	52.5	15.7	20.3	94.9	121.8	140.2	102.4	36.9
Average Queue (m)	32.9	37.4	27.9	22.0	31.7	2.3	2.7	48.4	54.0	76.3	14.4	10.3
95th Queue (m)	51.4	52.9	50.8	37.8	47.3	9.4	12.4	77.6	99.0	118.0	60.6	25.3
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)									0	1	1	
Queuing Penalty (veh)									0	3	4	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)								10				
Queuing Penalty (veh)								1				

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R
Maximum Queue (m)	51.7	17.0	23.8	10.5	48.5
Average Queue (m)	23.3	6.1	9.5	2.1	25.4
95th Queue (m)	41.6	14.0	20.4	7.8	44.6
Link Distance (m)	128.7	128.7		96.0	96.0
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)			60.0		
Storage Blk Time (%)	0				
Queuing Penalty (veh)	0				

Zone Summary

Zone wide Queuing Penalty: 10

Lane Group	WBT	NET
Lane Group Flow (vph)	1670	1443
v/c Ratio	0.66	0.75
Control Delay	10.9	31.8
Queue Delay	0.2	0.0
Total Delay	11.0	31.8
Queue Length 50th (m)	34.6	95.8
Queue Length 95th (m)	43.4	105.7
Internal Link Dist (m)	43.5	23.7
Turn Bay Length (m)		
Base Capacity (vph)	2530	2134
Starvation Cap Reductn	205	0
Spillback Cap Reductn	120	4
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.72	0.68

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	1670	0	0	1443	0	0	0	0
Future Volume (vph)	0	0	0	0	1670	0	0	1443	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0			6.0				
Lane Util. Factor					0.91			0.91				
Frt					1.00			1.00				
Flt Protected					1.00			1.00				
Satd. Flow (prot)					4995			4995				
Flt Permitted					1.00			1.00				
Satd. Flow (perm)					4995			4995				
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	0	1670	0	0	1443	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1670	0	0	1443	0	0	0	0
Heavy Vehicles (%)	0%	0%	0%	0%	5%	0%	0%	5%	0%	0%	0%	0%
Turn Type					NA			NA				
Protected Phases					6			8				
Permitted Phases												
Actuated Green, G (s)					55.7			42.3				
Effective Green, g (s)					55.7			42.3				
Actuated g/C Ratio					0.51			0.38				
Clearance Time (s)					6.0			6.0				
Vehicle Extension (s)					3.0			3.0				
Lane Grp Cap (vph)					2529			1920				
v/s Ratio Prot					c0.33			c0.29				
v/s Ratio Perm												
v/c Ratio					0.66			0.75				
Uniform Delay, d1					20.1			29.3				
Progression Factor					0.47			1.00				
Incremental Delay, d2					1.0			1.7				
Delay (s)					10.4			31.0				
Level of Service					B			C				
Approach Delay (s)		0.0			10.4			31.0			0.0	
Approach LOS		A			B			C			A	

Intersection Summary

HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	SBL
Lane Group Flow (vph)	1443	653
v/c Ratio	0.66	0.41
Control Delay	1.3	20.6
Queue Delay	0.2	0.0
Total Delay	1.5	20.6
Queue Length 50th (m)	0.0	46.6
Queue Length 95th (m)	0.0	60.7
Internal Link Dist (m)	41.3	34.0
Turn Bay Length (m)		
Base Capacity (vph)	2179	1578
Starvation Cap Reductn	174	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.72	0.41

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1443	0	0	653	0
Future Volume (vph)	0	1443	0	0	653	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			6.0	
Lane Util. Factor		0.91			0.97	
Frt		1.00			1.00	
Flt Protected		1.00			0.95	
Satd. Flow (prot)		4995			3404	
Flt Permitted		1.00			0.95	
Satd. Flow (perm)		4995			3404	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1443	0	0	653	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1443	0	0	653	0
Heavy Vehicles (%)	0%	5%	0%	0%	4%	0%
Turn Type		NA			Prot	
Protected Phases		4			6	
Permitted Phases						
Actuated Green, G (s)		48.0			51.0	
Effective Green, g (s)		48.0			51.0	
Actuated g/C Ratio		0.44			0.46	
Clearance Time (s)		5.0			6.0	
Vehicle Extension (s)		3.0			3.0	
Lane Grp Cap (vph)		2179			1578	
v/s Ratio Prot		c0.29			c0.19	
v/s Ratio Perm						
v/c Ratio		0.66			0.41	
Uniform Delay, d1		24.6			19.6	
Progression Factor		0.00			1.00	
Incremental Delay, d2		1.2			0.8	
Delay (s)		1.3			20.4	
Level of Service		A			C	
Approach Delay (s)		1.3	0.0		20.4	
Approach LOS		A	A		C	

Intersection Summary

HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	SWT
Lane Group Flow (vph)	1797	1657
v/c Ratio	0.83	0.72
Control Delay	19.9	26.5
Queue Delay	0.4	0.0
Total Delay	20.3	26.5
Queue Length 50th (m)	65.0	104.1
Queue Length 95th (m)	73.5	126.4
Internal Link Dist (m)	50.1	8.2
Turn Bay Length (m)		
Base Capacity (vph)	2314	2297
Starvation Cap Reductn	154	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.83	0.72

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	1797	0	0	0	0	0	0	0	0	1657	0
Future Volume (vph)	0	1797	0	0	0	0	0	0	0	0	1657	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0									6.0	
Lane Util. Factor		0.91									0.91	
Frt		1.00									1.00	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		5092									4948	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		5092									4948	
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	1797	0	0	0	0	0	0	0	0	1657	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1797	0	0	0	0	0	0	0	0	1657	0
Heavy Vehicles (%)	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	6%	0%
Turn Type		NA									NA	
Protected Phases		4									2	
Permitted Phases												
Actuated Green, G (s)		46.9									51.1	
Effective Green, g (s)		46.9									51.1	
Actuated g/C Ratio		0.43									0.46	
Clearance Time (s)		6.0									6.0	
Vehicle Extension (s)		3.0									3.0	
Lane Grp Cap (vph)		2171									2298	
v/s Ratio Prot		c0.35									c0.33	
v/s Ratio Perm												
v/c Ratio		0.83									0.72	
Uniform Delay, d1		28.0									23.7	
Progression Factor		0.60									1.00	
Incremental Delay, d2		2.3									2.0	
Delay (s)		19.1									25.7	
Level of Service		B									C	
Approach Delay (s)		19.1			0.0			0.0			25.7	
Approach LOS		B			A			A			C	

Intersection Summary

HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Traffic Volume (veh/h)	0	0	428	1670	0	0
Future Volume (Veh/h)	0	0	428	1670	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	428	1670	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	67			77		
pX, platoon unblocked					0.72	
vC, conflicting volume			0		1413	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		193	0
tC, single (s)			4.3		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			73		100	100
cM capacity (veh/h)			1558		408	1091

Direction, Lane #	WB 1	WB 2	WB 3
Volume Total	762	668	668
Volume Left	428	0	0
Volume Right	0	0	0
cSH	1558	1700	1700
Volume to Capacity	0.27	0.39	0.39
Queue Length 95th (m)	8.6	0.0	0.0
Control Delay (s)	5.8	0.0	0.0
Lane LOS	A		
Approach Delay (s)	2.1		
Approach LOS			

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1443	188	0	0	0	0
Future Volume (Veh/h)	1443	188	0	0	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1443	188	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				48		
pX, platoon unblocked						
vC, conflicting volume			1631		1443	481
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1631		1443	481
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			403		125	537

Direction, Lane #	EB 1	EB 2	EB 3	EB 4
Volume Total	481	481	481	188
Volume Left	0	0	0	0
Volume Right	0	0	0	188
cSH	1700	1700	1700	1700
Volume to Capacity	0.28	0.28	0.28	0.11
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0			
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	68.5%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	WBT	SBR
Lane Group Flow (vph)	1670	688
v/c Ratio	0.72	0.58
Control Delay	2.6	25.9
Queue Delay	0.0	0.0
Total Delay	2.6	25.9
Queue Length 50th (m)	0.1	61.3
Queue Length 95th (m)	0.2	81.3
Internal Link Dist (m)	10.7	
Turn Bay Length (m)		
Base Capacity (vph)	2315	1188
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.72	0.58

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	1670	0	0	688
Future Volume (vph)	0	0	1670	0	0	688
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			6.0			6.0
Lane Util. Factor			0.91			0.88
Frt			1.00			0.85
Flt Protected			1.00			1.00
Satd. Flow (prot)			4995			2763
Flt Permitted			1.00			1.00
Satd. Flow (perm)			4995			2763
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	1670	0	0	688
RTOR Reduction (vph)	0	0	0	0	0	7
Lane Group Flow (vph)	0	0	1670	0	0	681
Heavy Vehicles (%)	0%	0%	5%	0%	0%	4%
Turn Type			NA			Prot
Protected Phases			2			8
Permitted Phases						
Actuated Green, G (s)			51.0			47.0
Effective Green, g (s)			51.0			47.0
Actuated g/C Ratio			0.46			0.43
Clearance Time (s)			6.0			6.0
Lane Grp Cap (vph)			2315			1180
v/s Ratio Prot			c0.33			c0.25
v/s Ratio Perm						
v/c Ratio			0.72			0.58
Uniform Delay, d1			23.8			23.9
Progression Factor			0.05			1.00
Incremental Delay, d2			1.5			2.1
Delay (s)			2.6			26.0
Level of Service			A			C
Approach Delay (s)		0.0	2.6		26.0	
Approach LOS		A	A		C	

Intersection Summary

HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (veh/h)	0	0	1657	741	0	0
Future Volume (Veh/h)	0	0	1657	741	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	1657	741	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		32				
pX, platoon unblocked						
vC, conflicting volume	2398				1657	552
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2398				1657	552
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	203				91	482

Direction, Lane #	WB 1	WB 2	WB 3	WB 4
Volume Total	552	552	552	741
Volume Left	0	0	0	0
Volume Right	0	0	0	741
cSH	1700	1700	1700	1700
Volume to Capacity	0.32	0.32	0.32	0.44
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0			
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBT	NBR
Lane Group Flow (vph)	1797	233
v/c Ratio	0.75	0.20
Control Delay	1.4	18.1
Queue Delay	0.1	0.0
Total Delay	1.5	18.1
Queue Length 50th (m)	0.0	16.0
Queue Length 95th (m)	0.0	24.7
Internal Link Dist (m)	26.5	
Turn Bay Length (m)		
Base Capacity (vph)	2383	1170
Starvation Cap Reductn	85	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.78	0.20

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1797	0	0	0	0	233
Future Volume (vph)	1797	0	0	0	0	233
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5					4.5
Lane Util. Factor	0.91					0.88
Frt	1.00					0.85
Flt Protected	1.00					1.00
Satd. Flow (prot)	5092					2589
Flt Permitted	1.00					1.00
Satd. Flow (perm)	5092					2589
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1797	0	0	0	0	233
RTOR Reduction (vph)	0	0	0	0	0	5
Lane Group Flow (vph)	1797	0	0	0	0	228
Heavy Vehicles (%)	3%	0%	0%	0%	0%	11%
Turn Type	NA					Perm
Protected Phases	4					
Permitted Phases						2
Actuated Green, G (s)	51.5					49.5
Effective Green, g (s)	51.5					49.5
Actuated g/C Ratio	0.47					0.45
Clearance Time (s)	4.5					4.5
Lane Grp Cap (vph)	2383					1165
v/s Ratio Prot	c0.35					
v/s Ratio Perm						c0.09
v/c Ratio	0.75					0.20
Uniform Delay, d1	24.0					18.2
Progression Factor	0.00					1.00
Incremental Delay, d2	1.4					0.4
Delay (s)	1.4					18.6
Level of Service	A					B
Approach Delay (s)	1.4			0.0	18.6	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	3.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Traffic Volume (veh/h)	299	1797	0	0	0	0
Future Volume (Veh/h)	299	1797	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	299	1797	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		75	74			
pX, platoon unblocked					0.78	
vC, conflicting volume	0				1197	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				246	0
tC, single (s)	4.3				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	81				100	100
cM capacity (veh/h)	1572				457	1091

Direction, Lane #	EB 1	EB 2	EB 3
Volume Total	658	719	719
Volume Left	299	0	0
Volume Right	0	0	0
cSH	1572	1700	1700
Volume to Capacity	0.19	0.42	0.42
Queue Length 95th (m)	5.3	0.0	0.0
Control Delay (s)	4.6	0.0	0.0
Lane LOS	A		
Approach Delay (s)	1.4		
Approach LOS			

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	93.3%	ICU Level of Service	F
Analysis Period (min)	15		

Lane Group	WBT	NBL
Lane Group Flow (vph)	1657	441
v/c Ratio	0.77	0.30
Control Delay	5.0	19.6
Queue Delay	0.0	0.0
Total Delay	5.0	19.6
Queue Length 50th (m)	5.1	29.9
Queue Length 95th (m)	5.6	40.9
Internal Link Dist (m)	42.1	32.8
Turn Bay Length (m)		
Base Capacity (vph)	2159	1490
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.77	0.30

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1657	441	0
Future Volume (vph)	0	0	0	1657	441	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.0	6.0	
Lane Util. Factor				0.91	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				4948	3278	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				4948	3278	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	1657	441	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	1657	441	0
Heavy Vehicles (%)	0%	0%	0%	6%	8%	0%
Turn Type				NA	Prot	
Protected Phases				8	2	
Permitted Phases						
Actuated Green, G (s)				48.0	50.0	
Effective Green, g (s)				48.0	50.0	
Actuated g/C Ratio				0.44	0.45	
Clearance Time (s)				6.0	6.0	
Vehicle Extension (s)				3.0	3.0	
Lane Grp Cap (vph)				2159	1490	
v/s Ratio Prot				c0.33	c0.13	
v/s Ratio Perm						
v/c Ratio				0.77	0.30	
Uniform Delay, d1				26.3	18.9	
Progression Factor				0.12	1.00	
Incremental Delay, d2				1.8	0.5	
Delay (s)				5.0	19.4	
Level of Service				A	B	
Approach Delay (s)	0.0			5.0	19.4	
Approach LOS	A			A	B	

Intersection Summary

HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 1: West Terminal-E-S

Movement	WB	WB	WB	NE	NE	NE
Directions Served	T	T	T	T	T	T
Maximum Queue (m)	52.3	53.3	46.0	33.6	31.1	25.2
Average Queue (m)	38.9	40.1	30.2	24.4	23.3	18.4
95th Queue (m)	53.4	52.6	47.1	29.5	26.7	29.2
Link Distance (m)	18.6	18.6	18.6	22.8	22.8	22.8
Upstream Blk Time (%)	35	47	35	50	34	10
Queuing Penalty (veh)	193	260	194	242	164	48
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: W-N & N-E

Movement	EB	EB	EB	SB	SB
Directions Served	T	T	T	L	L
Maximum Queue (m)	20.2	14.8	1.5	64.9	56.8
Average Queue (m)	8.5	1.9	0.1	49.5	36.7
95th Queue (m)	17.1	8.8	1.1	66.4	52.3
Link Distance (m)	22.8	22.8	22.8	37.0	37.0
Upstream Blk Time (%)	1			19	6
Queuing Penalty (veh)	6			61	20
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: East Terminal

Movement	EB	EB	EB	SW	SW	SW
Directions Served	T	T	T	T	T	T
Maximum Queue (m)	67.1	63.4	64.0	45.7	45.4	42.7
Average Queue (m)	58.2	56.0	48.2	37.2	37.2	26.9
95th Queue (m)	62.4	63.4	64.2	42.5	43.1	43.8
Link Distance (m)	27.3	27.3	27.3	19.8	19.8	19.8
Upstream Blk Time (%)	39	44	35	56	44	18
Queuing Penalty (veh)	235	264	211	308	244	101
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: West Terminal-E-S

Movement	WB	WB	WB
Directions Served	LT	T	T
Maximum Queue (m)	55.5	52.2	28.6
Average Queue (m)	17.7	8.7	1.5
95th Queue (m)	45.2	33.0	11.8
Link Distance (m)	59.5	59.5	59.5
Upstream Blk Time (%)	0	0	0
Queuing Penalty (veh)	1	0	0
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: W-S

Movement	EB	EB	EB
Directions Served	T	T	T
Maximum Queue (m)	170.6	153.9	84.7
Average Queue (m)	110.2	88.9	31.2
95th Queue (m)	153.8	138.5	75.1
Link Distance (m)	183.8	183.8	183.8
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: N-W

Movement	WB	WB	WB	SB	SB
Directions Served	T	T	T	R	R
Maximum Queue (m)	6.2	13.6	17.3	67.8	56.3
Average Queue (m)	0.7	4.2	3.8	53.9	38.5
95th Queue (m)	4.3	11.2	12.3	66.9	52.2
Link Distance (m)	7.7	7.7	7.7	37.2	37.2
Upstream Blk Time (%)	2	19	14	24	7
Queuing Penalty (veh)	13	103	75	84	24
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 12: E-N

Movement	WB	WB	WB
Directions Served	T	T	T
Maximum Queue (m)	190.2	164.9	123.1
Average Queue (m)	129.4	107.1	49.1
95th Queue (m)	181.5	155.2	106.6
Link Distance (m)	187.5	187.5	187.5
Upstream Blk Time (%)	1		
Queuing Penalty (veh)	0		
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 14: S-E

Movement	EB	EB	EB	NB	NB
Directions Served	T	T	T	R	R
Maximum Queue (m)	4.4	10.0	15.3	52.0	41.2
Average Queue (m)	0.2	1.1	1.6	25.7	12.8
95th Queue (m)	2.0	5.9	8.5	45.5	34.6
Link Distance (m)	20.9	20.9	20.9	48.7	48.7
Upstream Blk Time (%)		0	0	0	0
Queuing Penalty (veh)		0	0	1	0
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 16: W-N/East Terminal

Movement	EB	EB	EB
Directions Served	LT	T	T
Maximum Queue (m)	58.9	49.7	34.1
Average Queue (m)	29.8	19.6	6.9
95th Queue (m)	52.4	45.1	23.8
Link Distance (m)	54.6	54.6	54.6
Upstream Blk Time (%)	0	0	0
Queuing Penalty (veh)	3	0	0
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 17: S-W

Movement	WB	WB	WB	NB	NB
Directions Served	T	T	T	L	L
Maximum Queue (m)	39.0	36.5	34.6	64.5	42.3
Average Queue (m)	26.1	22.1	13.4	45.2	28.0
95th Queue (m)	36.9	34.7	30.8	67.0	48.0
Link Distance (m)	31.8	31.8	31.8	39.6	39.6
Upstream Blk Time (%)	4	1	0	13	1
Queuing Penalty (veh)	24	6	1	28	2
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 2918

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	49	1582	376	1773	57	90	422	304	40
v/c Ratio	0.30	0.58	0.76	0.66	0.19	0.34	0.89	0.70	0.05
Control Delay	18.7	19.5	74.3	10.6	30.9	51.1	37.2	44.8	19.1
Queue Delay	0.0	0.6	0.0	0.1	0.0	0.0	0.6	0.0	0.0
Total Delay	18.7	20.1	74.3	10.7	30.9	51.1	37.9	44.8	19.1
Queue Length 50th (m)	3.5	54.6	42.7	104.9	10.9	22.3	35.5	67.7	2.0
Queue Length 95th (m)	12.5	73.8	60.2	173.5	18.5	35.3	71.9	84.0	6.3
Internal Link Dist (m)		85.2		118.2		85.0			175.8
Turn Bay Length (m)	70.0		65.0		20.0			40.0	
Base Capacity (vph)	164	2747	543	2692	293	438	590	433	1069
Starvation Cap Reductn	0	0	0	177	0	0	0	0	0
Spillback Cap Reductn	0	688	0	0	0	0	31	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.77	0.69	0.70	0.19	0.21	0.75	0.70	0.04

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	1540	42	376	1525	248	57	90	422	304	18	22
Future Volume (vph)	49	1540	42	376	1525	248	57	90	422	304	18	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0	6.0	4.0	6.0	
Lane Util. Factor	1.00	0.86		0.97	0.91		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.99	1.00	
Frt	1.00	1.00		1.00	0.98		1.00	1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	6320		3502	4953		1805	1900	1575	1777	3312	
Flt Permitted	0.09	1.00		0.95	1.00		0.73	1.00	1.00	0.58	1.00	
Satd. Flow (perm)	166	6320		3502	4953		1386	1900	1575	1080	3312	
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	1540	42	376	1525	248	57	90	422	304	18	22
RTOR Reduction (vph)	0	2	0	0	14	0	0	0	252	0	17	0
Lane Group Flow (vph)	49	1580	0	376	1759	0	57	90	170	304	23	0
Confl. Peds. (#/hr)	7		1	1		7			6	6		
Heavy Vehicles (%)	0%	3%	2%	0%	2%	3%	0%	0%	0%	1%	0%	0%
Turn Type	pm+pt	NA		Prot	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2						8		8	4		
Actuated Green, G (s)	61.0	55.7		18.3	68.7		23.5	19.0	19.0	40.0	31.5	
Effective Green, g (s)	61.0	55.7		18.3	68.7		23.5	19.0	19.0	40.0	31.5	
Actuated g/C Ratio	0.47	0.43		0.14	0.53		0.18	0.15	0.15	0.31	0.24	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0	6.0	4.0	6.0	
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)	144	2707		492	2617		265	277	230	423	802	
v/s Ratio Prot	0.01	0.25		c0.11	c0.36		0.01	0.05		c0.09	0.01	
v/s Ratio Perm	0.15						0.03		0.11	c0.13		
v/c Ratio	0.34	0.58		0.76	0.67		0.22	0.32	0.74	0.72	0.03	
Uniform Delay, d1	20.0	28.3		53.8	22.4		45.0	49.8	53.1	38.0	37.6	
Progression Factor	1.02	0.63		1.21	0.41		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	0.8		6.1	1.2		0.4	0.7	11.8	5.8	0.0	
Delay (s)	21.6	18.8		71.3	10.4		45.5	50.4	64.9	43.8	37.6	
Level of Service	C	B		E	B		D	D	E	D	D	
Approach Delay (s)		18.9			21.1			60.7			43.0	
Approach LOS		B			C			E			D	

Intersection Summary

HCM 2000 Control Delay	26.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	2084	180	456	1885	644	264
v/c Ratio	0.82	0.27	0.93	0.54	0.83	0.39
Control Delay	26.1	5.5	41.3	10.0	57.1	33.4
Queue Delay	0.2	0.0	0.0	0.6	1.2	0.0
Total Delay	26.2	5.5	41.3	10.6	58.3	33.4
Queue Length 50th (m)	161.8	2.8	88.1	132.7	85.0	26.2
Queue Length 95th (m)	106.8	m10.1	#164.2	171.8	103.1	39.1
Internal Link Dist (m)	118.2			168.8		
Turn Bay Length (m)		45.0	135.0		300.0	300.0
Base Capacity (vph)	2542	666	512	3476	906	778
Starvation Cap Reductn	59	0	0	1073	0	0
Spillback Cap Reductn	25	0	0	318	103	3
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.27	0.89	0.78	0.80	0.34

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)	0	2084	180	456	1885	0	0	0	0	644	0	264
Future Volume (vph)	0	2084	180	456	1885	0	0	0	0	644	0	264
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	4.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	1.00	0.91					0.97		0.88
Frpb, ped/bikes		1.00	1.00	1.00	1.00					1.00		1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		6408	1553	1736	5136					3367		2733
Flt Permitted		1.00	1.00	0.07	1.00					0.95		1.00
Satd. Flow (perm)		6408	1553	131	5136					3367		2733
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	2084	180	456	1885	0	0	0	0	644	0	264
RTOR Reduction (vph)	0	0	51	0	0	0	0	0	0	0	0	45
Lane Group Flow (vph)	0	2084	129	456	1885	0	0	0	0	644	0	219
Confl. Peds. (#/hr)	4					4						
Heavy Vehicles (%)	0%	2%	4%	4%	1%	0%	0%	0%	0%	4%	0%	4%
Turn Type		NA	Perm	pm+pt	NA					Prot		Perm
Protected Phases		2		1	6					4		
Permitted Phases			2	6								4
Actuated Green, G (s)		51.6	51.6	88.0	88.0					30.0		30.0
Effective Green, g (s)		51.6	51.6	88.0	88.0					30.0		30.0
Actuated g/C Ratio		0.40	0.40	0.68	0.68					0.23		0.23
Clearance Time (s)		6.0	6.0	4.0	6.0					6.0		6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		3.0
Lane Grp Cap (vph)		2543	616	488	3476					777		630
v/s Ratio Prot		0.33		c0.23	0.37					c0.19		
v/s Ratio Perm			0.08	c0.40								0.08
v/c Ratio		0.82	0.21	0.93	0.54					0.83		0.35
Uniform Delay, d1		35.0	25.8	39.5	10.7					47.6		41.8
Progression Factor		0.64	0.30	0.57	0.85					1.00		1.00
Incremental Delay, d2		2.5	0.6	18.2	0.4					7.3		0.3
Delay (s)		24.9	8.5	40.8	9.5					54.9		42.1
Level of Service		C	A	D	A					D		D
Approach Delay (s)		23.6			15.6			0.0			51.2	
Approach LOS		C			B			A			D	

Intersection Summary

HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	110.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	650	2079	1871	1044	471	588
v/c Ratio	0.95	0.59	0.79	1.00	0.65	0.95
Control Delay	52.9	16.9	21.0	23.7	51.6	70.2
Queue Delay	0.0	4.1	0.0	19.9	0.0	0.0
Total Delay	52.9	21.0	21.0	43.6	51.6	70.2
Queue Length 50th (m)	80.3	170.6	76.3	~60.9	60.1	81.1
Queue Length 95th (m)	#124.3	191.3	m70.2	m44.2	78.8	#120.3
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	682	3508	2375	1045	739	634
Starvation Cap Reductn	0	1332	0	61	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.96	0.79	1.06	0.64	0.93

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)	650	2079	0	0	1871	1044	471	0	588	0	0	0
Future Volume (vph)	650	2079	0	0	1871	1044	471	0	588	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0			6.0	6.0	6.0		6.0			
Lane Util. Factor	0.97	0.91			0.91	1.00	0.97		0.88			
Frpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00			
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)	3433	5036			5085	1583	3433		2733			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3433	5036			5085	1583	3433		2733			
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)	650	2079	0	0	1871	1044	471	0	588	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	306	0	0	47	0	0	0
Lane Group Flow (vph)	650	2079	0	0	1871	738	471	0	541	0	0	0
Confl. Peds. (#/hr)			3	3								
Heavy Vehicles (%)	2%	3%	0%	0%	2%	2%	2%	0%	4%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Prot		Perm			
Protected Phases	5	2			6		8					
Permitted Phases						6			8			
Actuated Green, G (s)	25.8	90.6			60.8	60.8	27.4		27.4			
Effective Green, g (s)	25.8	90.6			60.8	60.8	27.4		27.4			
Actuated g/C Ratio	0.20	0.70			0.47	0.47	0.21		0.21			
Clearance Time (s)	4.0	6.0			6.0	6.0	6.0		6.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0			
Lane Grp Cap (vph)	681	3509			2378	740	723		576			
v/s Ratio Prot	c0.19	0.41			0.37		0.14					
v/s Ratio Perm						c0.47			c0.20			
v/c Ratio	0.95	0.59			0.79	1.00	0.65		0.94			
Uniform Delay, d1	51.5	10.2			29.1	34.5	46.9		50.5			
Progression Factor	0.67	1.59			0.70	0.94	1.00		1.00			
Incremental Delay, d2	16.5	0.4			0.3	9.5	2.1		23.3			
Delay (s)	51.1	16.6			20.6	42.0	49.0		73.8			
Level of Service	D	B			C	D	D		E			
Approach Delay (s)		24.8			28.3			62.8			0.0	
Approach LOS		C			C			E			A	

Intersection Summary

HCM 2000 Control Delay	32.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	110.0%	ICU Level of Service	H
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)	464	1832	67	69	1725	282	659	90	251	50	533
v/c Ratio	1.33	0.99	0.10	0.43	1.09	0.46	0.83	0.21	0.75	0.14	1.28
Control Delay	211.2	35.6	0.5	26.0	75.4	6.0	56.7	33.6	66.1	48.0	176.5
Queue Delay	0.0	0.0	0.0	0.0	5.9	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	211.2	35.6	0.5	26.0	81.2	6.0	56.7	33.6	66.1	48.0	176.5
Queue Length 50th (m)	~81.9	~195.2	0.1	6.7	~185.3	4.3	87.0	16.2	65.2	11.5	~151.9
Queue Length 95th (m)	m#112.5	m#222.3	m0.4	m8.0	#216.8	m7.3	104.7	30.1	#121.6	24.6	#236.8
Internal Link Dist (m)		225.6			141.6			127.2		94.6	
Turn Bay Length (m)	160.0		175.0	50.0			50.0		60.0		
Base Capacity (vph)	350	1856	660	163	1588	618	933	492	334	351	415
Starvation Cap Reductn	0	0	0	0	46	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	1.33	0.99	0.10	0.42	1.12	0.46	0.71	0.18	0.75	0.14	1.28

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	464	1832	67	69	1725	282	659	65	25	251	50	533
Future Volume (vph)	464	1832	67	69	1725	282	659	65	25	251	50	533
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		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)	3502	4940	1578	1787	5036	1529	3467	1788		1805	1900	1615
Flt Permitted	0.95	1.00	1.00	0.10	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	4940	1578	184	5036	1529	3467	1788		1805	1900	1615
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)	464	1832	67	69	1725	282	659	65	25	251	50	533
RTOR Reduction (vph)	0	0	42	0	0	136	0	12	0	0	0	116
Lane Group Flow (vph)	464	1832	25	69	1725	146	659	78	0	251	50	417
Confl. Peds. (#/hr)	3		1	1		3			2	2		
Heavy Vehicles (%)	0%	5%	1%	1%	3%	4%	1%	2%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2	6		6						4
Actuated Green, G (s)	13.0	48.0	48.0	47.0	41.0	41.0	29.9	29.9		24.1	24.1	24.1
Effective Green, g (s)	13.0	48.0	48.0	47.0	41.0	41.0	29.9	29.9		24.1	24.1	24.1
Actuated g/C Ratio	0.10	0.37	0.37	0.36	0.32	0.32	0.23	0.23		0.19	0.19	0.19
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	350	1824	582	140	1588	482	797	411		334	352	299
v/s Ratio Prot	c0.13	0.37		0.02	c0.34		c0.19	0.04		0.14	0.03	
v/s Ratio Perm			0.02	0.16		0.10						c0.26
v/c Ratio	1.33	1.00	0.04	0.49	1.09	0.30	0.83	0.19		0.75	0.14	1.39
Uniform Delay, d1	58.5	41.0	26.3	32.7	44.5	33.7	47.6	40.3		50.1	44.3	53.0
Progression Factor	1.19	0.45	0.25	1.10	0.71	0.46	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	160.7	19.2	0.1	1.1	44.1	0.7	7.0	0.2		9.2	0.2	196.1
Delay (s)	230.2	37.5	6.7	37.1	75.6	16.3	54.6	40.5		59.3	44.5	249.0
Level of Service	F	D	A	D	E	B	D	D		E	D	F
Approach Delay (s)		74.5			66.2			52.9			179.7	
Approach LOS		E			E			D			F	

Intersection Summary

HCM 2000 Control Delay	83.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	100.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	594	1375	140	52	1485	220	301	355	169	594
v/c Ratio	0.92	0.55	0.19	0.25	0.90	0.86	0.44	0.93	0.20	0.96
Control Delay	77.5	20.0	5.5	18.9	49.7	88.9	38.7	67.3	38.6	49.2
Queue Delay	0.0	0.1	0.0	0.0	31.0	0.0	0.0	0.0	0.0	1.9
Total Delay	77.5	20.2	5.5	18.9	80.7	88.9	38.7	67.3	38.6	51.1
Queue Length 50th (m)	88.1	62.1	5.6	6.3	143.2	30.7	29.6	72.9	18.3	78.3
Queue Length 95th (m)	m90.2	m63.9	m6.2	12.9	#178.9	#53.4	44.0	#127.7	28.3	#154.3
Internal Link Dist (m)		141.6			238.0		219.7		226.0	
Turn Bay Length (m)	70.0		50.0	120.0		95.0		110.0		45.0
Base Capacity (vph)	649	2499	735	213	1648	256	780	381	973	654
Starvation Cap Reductn	0	304	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	251	0	0	0	0	16
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.63	0.19	0.24	1.06	0.86	0.39	0.93	0.17	0.93

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)	594	1375	140	52	1261	224	220	205	96	355	169	594
Future Volume (vph)	594	1375	140	52	1261	224	220	205	96	355	169	594
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3303	5085	1367	1703	4860		3467	3310		1686	3574	1524
Flt Permitted	0.95	1.00	1.00	0.18	1.00		0.95	1.00		0.41	1.00	1.00
Satd. Flow (perm)	3303	5085	1367	328	4860		3467	3310		726	3574	1524
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)	594	1375	140	52	1261	224	220	205	96	355	169	594
RTOR Reduction (vph)	0	0	65	0	19	0	0	44	0	0	0	250
Lane Group Flow (vph)	594	1375	75	52	1466	0	220	257	0	355	169	344
Confl. Peds. (#/hr)	1		4	4		1			1	1		
Heavy Vehicles (%)	6%	2%	16%	6%	2%	16%	1%	5%	0%	7%	1%	6%
Turn Type	Prot	NA	Perm	pm+pt	NA		Prot	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)	25.4	63.1	63.1	49.5	43.6		9.6	25.0		45.0	31.4	31.4
Effective Green, g (s)	25.4	63.1	63.1	49.5	43.6		9.6	25.0		45.0	31.4	31.4
Actuated g/C Ratio	0.20	0.49	0.49	0.38	0.34		0.07	0.19		0.35	0.24	0.24
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
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)	645	2468	663	187	1629		256	636		369	863	368
v/s Ratio Prot	c0.18	0.27		0.01	c0.30		0.06	0.08		c0.12	0.05	
v/s Ratio Perm			0.05	0.09						c0.21		0.23
v/c Ratio	0.92	0.56	0.11	0.28	0.90		0.86	0.40		0.96	0.20	0.94
Uniform Delay, d1	51.3	23.6	18.2	25.7	41.1		59.5	46.0		38.7	39.2	48.3
Progression Factor	1.36	0.80	1.11	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.6	0.3	0.1	0.8	8.4		23.7	0.4		36.7	0.1	30.7
Delay (s)	77.3	19.2	20.3	26.5	49.5		83.3	46.4		75.4	39.4	79.1
Level of Service	E	B	C	C	D		F	D		E	D	E
Approach Delay (s)		35.7			48.7			62.0			71.9	
Approach LOS		D			D			E			E	

Intersection Summary

HCM 2000 Control Delay	49.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	91.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	306	27	16	115	907	12	1113
v/c Ratio	0.66	0.16	0.05	0.35	0.39	0.03	0.57
Control Delay	30.5	33.7	15.6	8.7	9.6	6.6	16.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.5	33.7	15.6	8.7	9.6	6.6	16.3
Queue Length 50th (m)	17.9	4.6	0.2	7.5	42.1	0.7	79.3
Queue Length 95th (m)	33.4	12.1	5.9	16.1	83.4	3.0	115.2
Internal Link Dist (m)	115.4		50.9		226.0		199.1
Turn Bay Length (m)				70.0		50.0	
Base Capacity (vph)	758	166	416	356	2320	476	1952
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.16	0.04	0.32	0.39	0.03	0.57

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	1	142	27	1	15	115	880	27	12	948	165
Future Volume (vph)	163	1	142	27	1	15	115	880	27	12	948	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor		0.95		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.93		1.00	0.86		1.00	1.00		1.00	0.98	
Flt Protected		0.97		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3241		1442	1633		1656	3426		1805	3373	
Flt Permitted		0.81		0.32	1.00		0.18	1.00		0.31	1.00	
Satd. Flow (perm)		2689		488	1633		313	3426		590	3373	
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)	163	1	142	27	1	15	115	880	27	12	948	165
RTOR Reduction (vph)	0	125	0	0	12	0	0	1	0	0	10	0
Lane Group Flow (vph)	0	181	0	27	4	0	115	906	0	12	1103	0
Confl. Peds. (#/hr)			6	6			7		2	2		7
Heavy Vehicles (%)	0%	0%	0%	25%	0%	0%	9%	5%	0%	0%	5%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		12.9		20.8	20.8		74.6	69.3		63.6	62.3	
Effective Green, g (s)		12.9		20.8	20.8		74.6	69.3		63.6	62.3	
Actuated g/C Ratio		0.12		0.19	0.19		0.69	0.65		0.59	0.58	
Clearance Time (s)		6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		322		129	316		321	2210		364	1956	
v/s Ratio Prot				c0.01	0.00		c0.03	0.26		0.00	c0.33	
v/s Ratio Perm		c0.07		0.03			0.22			0.02		
v/c Ratio		0.56		0.21	0.01		0.36	0.41		0.03	0.56	
Uniform Delay, d1		44.6		35.8	35.0		7.8	9.2		9.0	14.1	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.2		0.8	0.0		0.7	0.6		0.0	1.2	
Delay (s)		46.8		36.6	35.0		8.5	9.8		9.0	15.3	
Level of Service		D		D	D		A	A		A	B	
Approach Delay (s)		46.8			36.0			9.6			15.2	
Approach LOS		D			D			A			B	

Intersection Summary

HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	107.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	83.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	169	1	102	1	98	962	1196
v/c Ratio	0.65	0.00	0.40	0.00	0.27	0.38	0.54
Control Delay	49.3	35.0	12.4	0.0	5.6	5.5	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.3	35.0	12.4	0.0	5.6	5.5	11.8
Queue Length 50th (m)	30.8	0.2	0.0	0.0	3.2	24.9	56.7
Queue Length 95th (m)	52.7	1.6	14.0	0.0	12.3	60.8	117.1
Internal Link Dist (m)		62.1		66.5		199.1	252.7
Turn Bay Length (m)	25.0				70.0		
Base Capacity (vph)	262	483	389	525	396	2557	2216
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.00	0.26	0.00	0.25	0.38	0.54

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	169	1	102	0	0	1	98	961	1	0	1024	172
Future Volume (vph)	169	1	102	0	0	1	98	961	1	0	1024	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0		6.0		4.0	6.0			6.0	
Lane Util. Factor	1.00	1.00	1.00		1.00		1.00	0.95			0.95	
Frpb, ped/bikes	1.00	1.00	1.00		1.00		1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85		0.85		1.00	1.00			0.98	
Flt Protected	0.95	1.00	1.00		1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1770	1900	1233		1615		1805	3471			3461	
Flt Permitted	0.70	1.00	1.00		1.00		0.16	1.00			1.00	
Satd. Flow (perm)	1307	1900	1233		1615		312	3471			3461	
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)	169	1	102	0	0	1	98	961	1	0	1024	172
RTOR Reduction (vph)	0	0	84	0	1	0	0	0	0	0	9	0
Lane Group Flow (vph)	169	1	18	0	0	0	98	962	0	0	1187	0
Confl. Peds. (#/hr)							2		2	2		2
Heavy Vehicles (%)	2%	0%	31%	0%	0%	0%	0%	4%	0%	0%	2%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	17.6	17.6	17.6		1.7		70.2	70.2			60.0	
Effective Green, g (s)	17.6	17.6	17.6		1.7		70.2	70.2			60.0	
Actuated g/C Ratio	0.18	0.18	0.18		0.02		0.70	0.70			0.60	
Clearance Time (s)	4.0	6.0	6.0		6.0		4.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	285	335	217		27		312	2441			2080	
v/s Ratio Prot	c0.07	0.00			0.00		0.02	c0.28			c0.34	
v/s Ratio Perm	c0.03		0.01				0.20					
v/c Ratio	0.59	0.00	0.08		0.00		0.31	0.39			0.57	
Uniform Delay, d1	37.4	33.9	34.4		48.2		7.1	6.1			12.1	
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00			1.00	
Incremental Delay, d2	3.3	0.0	0.2		0.0		0.6	0.5			1.1	
Delay (s)	40.7	33.9	34.5		48.2		7.6	6.6			13.2	
Level of Service	D	C	C		D		A	A			B	
Approach Delay (s)		38.4			48.2			6.7			13.2	
Approach LOS		D			D			A			B	

Intersection Summary

HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	99.8	Sum of lost time (s)	20.0
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	108	23	63	71	31	66	1012	87	1186
v/c Ratio	0.26	0.07	0.17	0.18	0.10	0.25	0.59	0.32	0.68
Control Delay	32.6	41.3	3.4	31.4	20.4	11.2	23.5	12.4	24.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.6	41.3	3.4	31.4	20.4	11.2	23.5	12.4	24.8
Queue Length 50th (m)	19.7	4.8	0.0	12.7	1.7	6.0	91.3	8.0	111.9
Queue Length 95th (m)	34.6	12.5	4.6	24.5	10.6	11.7	113.0	14.9	136.9
Internal Link Dist (m)		132.6			203.0		252.7		204.9
Turn Bay Length (m)	50.0		50.0	30.0		70.0		65.0	
Base Capacity (vph)	415	348	373	396	323	268	1706	268	1749
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	0.26	0.07	0.17	0.18	0.10	0.25	0.59	0.32	0.68

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	108	23	63	71	8	23	66	960	52	87	1062	124
Future Volume (vph)	108	23	63	71	8	23	66	960	52	87	1062	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.89		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1900	1593	1717	1664		1805	3465		1455	3486	
Flt Permitted	0.74	1.00	1.00	0.74	1.00		0.14	1.00		0.19	1.00	
Satd. Flow (perm)	1400	1900	1593	1342	1664		262	3465		285	3486	
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)	108	23	63	71	8	23	66	960	52	87	1062	124
RTOR Reduction (vph)	0	0	51	0	19	0	0	3	0	0	8	0
Lane Group Flow (vph)	108	23	12	71	12	0	66	1009	0	87	1179	0
Confl. Peds. (#/hr)			1	1			3		3	3		3
Heavy Vehicles (%)	0%	0%	0%	5%	0%	2%	0%	3%	8%	24%	2%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	31.0	22.0	22.0	31.0	22.0		68.0	59.0		70.0	60.0	
Effective Green, g (s)	31.0	22.0	22.0	31.0	22.0		68.0	59.0		70.0	60.0	
Actuated g/C Ratio	0.26	0.18	0.18	0.26	0.18		0.57	0.49		0.58	0.50	
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Grp Cap (vph)	392	348	292	374	305		264	1703		263	1743	
v/s Ratio Prot	c0.02	0.01		0.01	0.01		0.02	0.29		c0.03	c0.34	
v/s Ratio Perm	c0.05		0.01	0.03			0.12			0.17		
v/c Ratio	0.28	0.07	0.04	0.19	0.04		0.25	0.59		0.33	0.68	
Uniform Delay, d1	35.1	40.5	40.3	34.4	40.3		14.7	21.9		13.3	22.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.7	0.4	0.3	1.1	0.2		2.3	1.5		3.3	2.1	
Delay (s)	36.8	40.9	40.6	35.6	40.6		17.0	23.4		16.6	24.8	
Level of Service	D	D	D	D	D		B	C		B	C	
Approach Delay (s)		38.5			37.1			23.0			24.2	
Approach LOS		D			D			C			C	

Intersection Summary

HCM 2000 Control Delay	25.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	0	9	78	0	30	7	1086	19	8	1027	6
Future Volume (Veh/h)	25	0	9	78	0	30	7	1086	19	8	1027	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	25	0	9	78	0	30	7	1086	19	8	1027	6
Pedestrians					3						1	
Lane Width (m)					3.6						3.6	
Walking Speed (m/s)					1.2						1.2	
Percent Blockage					0						0	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								229				
pX, platoon unblocked	0.80	0.80		0.80	0.80	0.80				0.80		
vC, conflicting volume	1634	2168	516	1651	2162	556	1033			1108		
vC1, stage 1 conf vol	1046	1046		1112	1112							
vC2, stage 2 conf vol	588	1122		538	1049							
vCu, unblocked vol	1285	1956	516	1307	1947	0	1033			625		
tC, single (s)	7.5	6.5	6.9	7.6	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.6	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	89	100	98	72	100	97	99			99		
cM capacity (veh/h)	230	228	504	280	227	866	668			768		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	34	108	7	724	381	8	685	348
Volume Left	25	78	7	0	0	8	0	0
Volume Right	9	30	0	0	19	0	0	6
cSH	269	345	668	1700	1700	768	1700	1700
Volume to Capacity	0.13	0.31	0.01	0.43	0.22	0.01	0.40	0.20
Queue Length 95th (m)	3.4	10.5	0.3	0.0	0.0	0.3	0.0	0.0
Control Delay (s)	20.3	20.1	10.4	0.0	0.0	9.7	0.0	0.0
Lane LOS	C	C	B			A		
Approach Delay (s)	20.3	20.1	0.1			0.1		
Approach LOS	C	C						

Intersection Summary				
Average Delay	1.3			
Intersection Capacity Utilization	44.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	110	110	41	1098	932	28
Future Volume (Veh/h)	110	110	41	1098	932	28
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	110	110	41	1098	932	28
Pedestrians	1					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)					276	
pX, platoon unblocked	0.92	0.92	0.92			
vC, conflicting volume	1578	481	961			
vC1, stage 1 conf vol	947					
vC2, stage 2 conf vol	631					
vCu, unblocked vol	1456	265	786			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	65	84	95			
cM capacity (veh/h)	310	681	775			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	110	110	41	549	549	621	339
Volume Left	110	0	41	0	0	0	0
Volume Right	0	110	0	0	0	0	28
cSH	310	681	775	1700	1700	1700	1700
Volume to Capacity	0.35	0.16	0.05	0.32	0.32	0.37	0.20
Queue Length 95th (m)	12.4	4.6	1.3	0.0	0.0	0.0	0.0
Control Delay (s)	22.9	11.3	9.9	0.0	0.0	0.0	0.0
Lane LOS	C	B	A				
Approach Delay (s)	17.1		0.4			0.0	
Approach LOS	C						

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	46.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	35	27	10	1168	900	17
Future Volume (Veh/h)	35	27	10	1168	900	17
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	35	27	10	1168	900	17
Pedestrians	2					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)					122	
pX, platoon unblocked	0.91	0.91	0.91			
vC, conflicting volume	1514	460	919			
vC1, stage 1 conf vol	910					
vC2, stage 2 conf vol	604					
vCu, unblocked vol	1363	202	707			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	96	99			
cM capacity (veh/h)	337	735	816			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	62	10	584	584	600	317
Volume Left	35	10	0	0	0	0
Volume Right	27	0	0	0	0	17
cSH	441	816	1700	1700	1700	1700
Volume to Capacity	0.14	0.01	0.34	0.34	0.35	0.19
Queue Length 95th (m)	3.9	0.3	0.0	0.0	0.0	0.0
Control Delay (s)	14.5	9.5	0.0	0.0	0.0	0.0
Lane LOS	B	A				
Approach Delay (s)	14.5	0.1			0.0	
Approach LOS	B					

Intersection Summary				
Average Delay		0.5		
Intersection Capacity Utilization		42.5%	ICU Level of Service	A
Analysis Period (min)		15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	208	819	220	304	560	217	433	769	167	385	228
v/c Ratio	0.71	0.81	0.42	0.92	0.50	0.37	0.88	0.71	0.61	0.52	0.48
Control Delay	35.3	46.3	15.9	62.1	35.4	14.2	46.0	38.2	31.5	44.9	8.8
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	35.3	46.3	15.9	62.1	35.4	14.2	46.0	38.2	31.5	44.9	8.8
Queue Length 50th (m)	31.1	99.1	15.6	53.4	59.8	14.6	76.9	83.1	24.6	44.9	0.0
Queue Length 95th (m)	#51.9	124.2	38.7	#108.2	77.8	36.0	#116.9	106.5	39.8	61.4	21.9
Internal Link Dist (m)		844.2			279.6			97.5		104.6	
Turn Bay Length (m)	25.0		25.0	40.0		25.0	100.0		40.0		50.0
Base Capacity (vph)	299	1017	528	332	1122	590	495	1080	290	741	472
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	0.70	0.81	0.42	0.92	0.50	0.37	0.87	0.71	0.58	0.52	0.48

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)	208	819	220	304	560	217	433	531	238	167	385	228
Future Volume (vph)	208	819	220	304	560	217	433	531	238	167	385	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		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)	1253	3471	1476	1770	3574	1583	1735	3385		1770	3539	1396
Flt Permitted	0.35	1.00	1.00	0.13	1.00	1.00	0.34	1.00		0.27	1.00	1.00
Satd. Flow (perm)	458	3471	1476	246	3574	1583	628	3385		499	3539	1396
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)	208	819	220	304	560	217	433	531	238	167	385	228
RTOR Reduction (vph)	0	0	96	0	0	93	0	42	0	0	0	180
Lane Group Flow (vph)	208	819	124	304	560	124	433	727	0	167	385	48
Confl. Peds. (#/hr)			1	1			2					2
Heavy Vehicles (%)	44%	4%	8%	2%	1%	2%	4%	2%	1%	2%	2%	14%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	49.3	35.0	35.0	54.3	37.5	37.5	51.6	36.6		36.0	25.0	25.0
Effective Green, g (s)	49.3	35.0	35.0	54.3	37.5	37.5	51.6	36.6		36.0	25.0	25.0
Actuated g/C Ratio	0.41	0.29	0.29	0.45	0.31	0.31	0.43	0.31		0.30	0.21	0.21
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	6.0
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)	284	1017	432	326	1122	497	480	1037		267	740	292
v/s Ratio Prot	0.09	0.24		c0.13	0.16		c0.17	0.21		0.06	0.11	
v/s Ratio Perm	0.21		0.08	c0.29		0.08	c0.22			0.13		0.03
v/c Ratio	0.73	0.81	0.29	0.93	0.50	0.25	0.90	0.70		0.63	0.52	0.16
Uniform Delay, d1	25.0	39.0	32.6	30.3	33.3	30.5	26.4	36.6		32.4	41.9	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
Incremental Delay, d2	9.4	4.7	0.4	32.6	0.4	0.3	20.0	3.9		4.5	2.6	1.2
Delay (s)	34.4	43.8	32.9	62.9	33.7	30.7	46.4	40.5		36.9	44.5	39.8
Level of Service	C	D	C	E	C	C	D	D		D	D	D
Approach Delay (s)		40.3			41.3			42.6			41.5	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	41.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	119.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	106.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	109	1380	209	1395	99	419	48	48
v/c Ratio	0.36	0.46	0.56	0.42	0.46	0.73	0.28	0.15
Control Delay	9.4	16.6	35.7	1.8	51.7	22.3	46.4	31.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.4	16.6	35.7	1.8	51.7	22.3	46.4	31.5
Queue Length 50th (m)	6.7	72.3	24.8	6.9	23.3	14.0	11.0	3.1
Queue Length 95th (m)	14.3	107.4	51.8	8.0	38.3	30.5	21.4	9.2
Internal Link Dist (m)		279.3		65.0		101.6		166.7
Turn Bay Length (m)	60.0		50.0		45.0		50.0	
Base Capacity (vph)	348	2981	466	3342	217	948	176	741
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	0.31	0.46	0.45	0.42	0.46	0.44	0.27	0.06

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	109	1267	113	209	1382	13	99	102	317	48	23	25
Future Volume (vph)	109	1267	113	209	1382	13	99	102	317	48	23	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.89		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	4977		1769	5126		1792	3144		1787	3236	
Flt Permitted	0.17	1.00		0.14	1.00		0.57	1.00		0.41	1.00	
Satd. Flow (perm)	320	4977		262	5126		1080	3144		768	3236	
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)	109	1267	113	209	1382	13	99	102	317	48	23	25
RTOR Reduction (vph)	0	5	0	0	0	0	0	287	0	0	23	0
Lane Group Flow (vph)	109	1375	0	209	1395	0	99	132	0	48	25	0
Confl. Peds. (#/hr)	8		7	7		8	10		1	1		10
Heavy Vehicles (%)	0%	3%	0%	2%	1%	4%	0%	0%	1%	1%	3%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	84.4	76.5		95.4	83.5		21.2	12.4		16.0	9.8	
Effective Green, g (s)	84.4	76.5		95.4	83.5		21.2	12.4		16.0	9.8	
Actuated g/C Ratio	0.65	0.59		0.73	0.64		0.16	0.10		0.12	0.08	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	297	2928		364	3292		224	299		143	243	
v/s Ratio Prot	0.02	0.28		c0.07	0.27		c0.03	0.04		0.02	0.01	
v/s Ratio Perm	0.22			c0.35			c0.04			0.03		
v/c Ratio	0.37	0.47		0.57	0.42		0.44	0.44		0.34	0.10	
Uniform Delay, d1	8.7	15.2		8.7	11.4		48.2	55.5		51.5	56.0	
Progression Factor	1.00	1.00		4.48	0.13		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8	0.5		1.7	0.3		1.4	1.0		1.4	0.2	
Delay (s)	9.4	15.8		40.8	1.8		49.6	56.6		52.9	56.2	
Level of Service	A	B		D	A		D	E		D	E	
Approach Delay (s)		15.3			6.9			55.2			54.5	
Approach LOS		B			A			E			D	

Intersection Summary			
HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
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)	5	698	4	106	705	47	58	367	176	340	345	95
v/c Ratio	0.03	0.51	0.01	0.54	0.52	0.07	0.11	0.20	0.20	0.67	0.19	0.11
Control Delay	23.8	30.1	0.0	40.9	30.2	7.0	15.7	16.0	7.6	29.7	15.9	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	23.8	30.1	0.0	40.9	30.2	7.0	15.7	16.0	7.6	29.7	15.9	3.2
Queue Length 50th (m)	0.8	69.1	0.0	20.2	70.0	0.0	7.1	24.8	9.6	60.3	23.2	0.0
Queue Length 95th (m)	3.6	87.8	0.0	41.5	88.9	8.0	14.9	34.3	21.9	98.3	32.2	8.5
Internal Link Dist (m)		259.3			844.2			279.0			144.9	
Turn Bay Length (m)	60.0		60.0	60.0		60.0	60.0		60.0	60.0		60.0
Base Capacity (vph)	195	1356	623	197	1356	635	519	1828	864	505	1828	863
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	0.03	0.51	0.01	0.54	0.52	0.07	0.11	0.20	0.20	0.67	0.19	0.11

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	698	4	106	705	47	58	367	176	340	345	95
Future Volume (vph)	5	698	4	106	705	47	58	367	176	340	345	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	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)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.27	1.00	1.00	0.28	1.00	1.00	0.54	1.00	1.00	0.52	1.00	1.00
Satd. Flow (perm)	509	3539	1583	516	3539	1583	1006	3539	1583	978	3539	1583
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	698	4	106	705	47	58	367	176	340	345	95
RTOR Reduction (vph)	0	0	2	0	0	29	0	0	47	0	0	46
Lane Group Flow (vph)	5	698	2	106	705	18	58	367	129	340	345	49
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	46.0	46.0	46.0	46.0	46.0	46.0	62.0	62.0	62.0	62.0	62.0	62.0
Effective Green, g (s)	46.0	46.0	46.0	46.0	46.0	46.0	62.0	62.0	62.0	62.0	62.0	62.0
Actuated g/C Ratio	0.38	0.38	0.38	0.38	0.38	0.38	0.52	0.52	0.52	0.52	0.52	0.52
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Grp Cap (vph)	195	1356	606	197	1356	606	519	1828	817	505	1828	817
v/s Ratio Prot		0.20			0.20			0.10			0.10	
v/s Ratio Perm	0.01		0.00	c0.21		0.01	0.06		0.08	c0.35		0.03
v/c Ratio	0.03	0.51	0.00	0.54	0.52	0.03	0.11	0.20	0.16	0.67	0.19	0.06
Uniform Delay, d1	23.0	28.4	22.8	28.7	28.5	23.1	14.9	15.6	15.3	21.5	15.5	14.5
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	0.2	1.4	0.0	10.1	1.4	0.1	0.4	0.2	0.4	7.0	0.2	0.1
Delay (s)	23.3	29.8	22.8	38.9	29.9	23.2	15.3	15.9	15.7	28.5	15.8	14.6
Level of Service	C	C	C	D	C	C	B	B	B	C	B	B
Approach Delay (s)		29.7			30.7			15.8			21.2	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	24.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	B38	B38	B38	WB	WB	WB	WB
Directions Served	L	T	T	T	TR	T	T	T	L	L	T	T
Maximum Queue (m)	77.4	110.6	115.9	100.8	92.1	56.6	62.7	45.7	56.6	60.1	62.0	85.5
Average Queue (m)	20.4	72.5	74.4	60.2	51.1	10.1	11.0	7.0	32.1	38.2	17.4	29.7
95th Queue (m)	62.2	115.1	117.0	99.0	83.5	45.8	50.5	38.6	51.7	54.9	43.2	63.7
Link Distance (m)		86.8	86.8	86.8	86.8	65.4	65.4	65.4			114.0	114.0
Upstream Blk Time (%)		14	14	2	1	1	1	0				
Queuing Penalty (veh)		57	57	7	2	3	4	1				
Storage Bay Dist (m)	70.0								65.0	65.0		
Storage Blk Time (%)	0	20							0	0	0	
Queuing Penalty (veh)	0	10							0	0	0	

Intersection: 3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

Movement	WB	NB	NB	NB	SB	SB	SB
Directions Served	TR	L	T	R	L	T	TR
Maximum Queue (m)	91.7	34.8	44.0	90.7	47.4	160.0	109.0
Average Queue (m)	38.9	12.0	21.2	67.0	45.6	87.3	12.9
95th Queue (m)	75.2	27.1	39.4	102.0	52.4	178.6	56.3
Link Distance (m)	114.0		86.1	86.1		180.4	180.4
Upstream Blk Time (%)				14		8	
Queuing Penalty (veh)				0		0	
Storage Bay Dist (m)		20.0			40.0		
Storage Blk Time (%)		4	18		59	1	
Queuing Penalty (veh)		3	10		5	2	

Intersection: 6: Mapleview Drive W & Highway 400 SB Off-Ramp

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	T	R	L	T	T	T	L	L	R
Maximum Queue (m)	128.4	122.5	122.0	116.0	73.9	139.7	102.4	55.6	63.8	307.5	358.8	352.9
Average Queue (m)	81.8	88.3	71.0	64.7	13.6	67.3	37.5	35.2	44.9	270.7	299.1	190.0
95th Queue (m)	135.5	134.0	124.2	111.7	52.0	124.0	67.6	51.8	60.5	359.9	410.6	421.4
Link Distance (m)	114.0	114.0	114.0	114.0			168.4	168.4	168.4		326.9	326.9
Upstream Blk Time (%)	2	3	1	0			0				46	16
Queuing Penalty (veh)	11	15	3	1			1				0	0
Storage Bay Dist (m)					45.0	135.0				300.0		
Storage Blk Time (%)				18		1				8	49	20
Queuing Penalty (veh)				32		7				26	159	27

Intersection: 6: Mapleview Drive W & Highway 400 SB Off-Ramp

Movement	SB	B36	B36
Directions Served	R	T	T
Maximum Queue (m)	307.5	173.4	170.6
Average Queue (m)	123.5	67.3	61.4
95th Queue (m)	335.7	192.7	186.5
Link Distance (m)		176.9	176.9
Upstream Blk Time (%)		18	15
Queuing Penalty (veh)		0	0
Storage Bay Dist (m)	300.0		
Storage Blk Time (%)	0		
Queuing Penalty (veh)	0		

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (m)	117.4	145.6	160.3	155.3	131.7	106.4	71.5	95.8	140.5	121.4	128.9	184.5
Average Queue (m)	58.7	65.6	78.9	58.2	53.4	66.6	43.6	46.4	93.7	60.7	73.7	98.3
95th Queue (m)	106.9	121.3	171.0	137.8	111.3	93.9	63.4	71.5	133.4	143.2	206.6	230.0
Link Distance (m)		168.4	168.4	168.4	168.4	218.3	218.3	218.3			335.8	335.8
Upstream Blk Time (%)		0	2	0							6	7
Queuing Penalty (veh)		1	11	1							0	0
Storage Bay Dist (m)	130.0								130.0	265.0		
Storage Blk Time (%)	0	0						0	1	0	2	8
Queuing Penalty (veh)	1	1						0	9	1	4	23

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	NB
Directions Served	R
Maximum Queue (m)	158.0
Average Queue (m)	72.7
95th Queue (m)	174.3
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	265.0
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	L
Maximum Queue (m)	177.3	194.3	217.8	206.7	181.8	17.7	57.2	134.7	130.9	143.1	164.4	57.4
Average Queue (m)	131.7	139.5	127.8	72.7	77.7	4.7	16.0	68.6	94.7	116.4	83.2	55.5
95th Queue (m)	204.4	219.3	242.7	138.0	131.2	12.3	43.3	115.9	144.9	154.9	194.7	66.7
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)			9	1	0			0	0	5	6	
Queuing Penalty (veh)			81	12	0			2	2	26	33	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)	24	32	0					17				6
Queuing Penalty (veh)	146	193	0					12				18

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R
Maximum Queue (m)	141.3	134.0	67.1	100.6	100.6
Average Queue (m)	125.9	58.8	43.2	50.1	100.6
95th Queue (m)	154.2	148.9	68.9	123.3	100.6
Link Distance (m)	128.7	128.7		96.0	96.0
Upstream Blk Time (%)	41	6		10	92
Queuing Penalty (veh)	0	0		0	0
Storage Bay Dist (m)			60.0		
Storage Blk Time (%)	56		10		
Queuing Penalty (veh)	185		5		

Intersection: 15: Bayview Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	T	R	L	T	T	TR	L	L
Maximum Queue (m)	82.4	94.6	104.6	62.9	61.2	34.0	24.0	249.4	257.9	261.4	69.7	79.8
Average Queue (m)	65.1	70.5	36.5	36.1	36.6	12.6	6.4	139.7	243.5	251.8	29.0	46.9
95th Queue (m)	89.1	96.2	78.0	57.8	56.3	26.5	17.4	279.7	284.4	258.1	61.8	74.6
Link Distance (m)			131.2	131.2	131.2			244.4	244.4	244.4		
Upstream Blk Time (%)			1					3	43	93		
Queuing Penalty (veh)			4					0	0	0		
Storage Bay Dist (m)	70.0	70.0				50.0	120.0				95.0	95.0
Storage Blk Time (%)	11	21	1		3			0			0	0
Queuing Penalty (veh)	50	98	4		4			0			0	0

Intersection: 15: Bayview Drive & Mapleview Drive W

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	TR	L	T	T	R
Maximum Queue (m)	59.5	58.0	117.5	206.4	205.2	80.0
Average Queue (m)	31.3	28.7	108.3	131.9	92.1	59.5
95th Queue (m)	51.3	50.8	136.6	271.4	208.8	101.8
Link Distance (m)	218.2	218.2		214.5	214.5	
Upstream Blk Time (%)				10	0	
Queuing Penalty (veh)				56	1	
Storage Bay Dist (m)			110.0			45.0
Storage Blk Time (%)			54	1	1	24
Queuing Penalty (veh)			45	3	4	20

Intersection: 18: Bayview Drive & South Village Way/Barrie Molson Centre D/W

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	58.9	40.5	28.2	10.6	42.4	93.1	86.1	46.6	125.2	162.1
Average Queue (m)	33.1	18.1	7.2	3.0	16.0	32.8	34.3	4.6	55.1	93.5
95th Queue (m)	52.4	34.1	19.9	10.1	30.6	71.7	72.8	23.1	143.6	180.1
Link Distance (m)	126.0	126.0	60.2	60.2		214.5	214.5		195.2	195.2
Upstream Blk Time (%)									1	2
Queuing Penalty (veh)									6	12
Storage Bay Dist (m)					70.0			50.0		
Storage Blk Time (%)						1			16	
Queuing Penalty (veh)						1			2	

Intersection: 21: Bayview Drive & North Village Way/Private D/W

Movement	EB	EB	EB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	R	TR	L	T	TR	T	TR
Maximum Queue (m)	43.6	36.4	50.5	6.4	26.3	68.6	74.6	139.9	164.0
Average Queue (m)	25.3	2.9	19.4	0.3	11.1	22.0	23.1	49.4	74.2
95th Queue (m)	41.1	24.0	42.1	2.6	22.6	52.8	55.6	136.8	159.6
Link Distance (m)		71.5	71.5	75.9		195.2	195.2	247.7	247.7
Upstream Blk Time (%)		1	0					0	0
Queuing Penalty (veh)		0	0					0	1
Storage Bay Dist (m)	25.0				70.0				
Storage Blk Time (%)	14					0		3	
Queuing Penalty (veh)	0					0		0	

Intersection: 24: Bayview Drive & Concert Way/Churchill Drive

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	39.2	21.7	20.6	33.4	26.5	65.1	105.4	104.3	72.2	121.1	126.0
Average Queue (m)	15.4	5.8	8.5	12.8	6.0	11.9	59.6	61.0	18.5	65.7	82.5
95th Queue (m)	31.3	16.1	17.3	26.5	17.5	34.3	95.3	96.4	45.5	100.7	117.8
Link Distance (m)		140.4			212.1		247.7	247.7		206.2	206.2
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (m)	50.0		50.0	30.0		70.0			65.0		
Storage Blk Time (%)	0			1	0		3		0	3	
Queuing Penalty (veh)	0			0	0		2		0	3	

Intersection: 28: Bayview Drive & Industrial Site D/W South/Coca-Cola D/W

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (m)	29.1	100.9	8.2	1.5	7.7	0.9
Average Queue (m)	8.5	36.4	1.0	0.1	0.7	0.0
95th Queue (m)	20.4	85.2	5.3	1.5	4.1	0.6
Link Distance (m)	196.9	182.1		206.2		206.3
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			15.0		15.0	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 29: Bayview Drive & Medical Centre South D/W

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (m)	89.5	72.2	19.2	107.7	107.2	5.2	4.5
Average Queue (m)	46.2	20.9	7.0	30.6	20.6	0.2	0.3
95th Queue (m)	95.4	66.2	19.4	108.5	87.5	2.7	3.3
Link Distance (m)	102.1	102.1		206.3	206.3	137.8	137.8
Upstream Blk Time (%)	11	7					
Queuing Penalty (veh)	0	0					
Storage Bay Dist (m)			15.0				
Storage Blk Time (%)			1	15			
Queuing Penalty (veh)			4	6			

Intersection: 31: Bayview Drive & Medical Centre North D/W

Movement	EB	NB	NB	NB
Directions Served	LR	L	T	T
Maximum Queue (m)	107.8	19.6	143.3	144.6
Average Queue (m)	62.8	2.3	87.0	72.3
95th Queue (m)	131.8	11.0	180.9	169.9
Link Distance (m)	108.5		137.8	137.8
Upstream Blk Time (%)	37		10	2
Queuing Penalty (veh)	0		61	12
Storage Bay Dist (m)		15.0		
Storage Blk Time (%)		0	46	
Queuing Penalty (veh)		1	5	

Intersection: 33: Bayview Drive & Big Bay Point Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	TR	L
Maximum Queue (m)	75.0	352.7	363.9	75.0	94.4	199.4	182.5	65.1	92.3	112.1	104.5	93.8
Average Queue (m)	63.0	198.8	196.0	53.6	67.3	88.0	75.3	20.4	86.2	94.9	74.9	48.8
95th Queue (m)	94.0	433.1	437.4	98.0	105.6	192.7	175.7	48.8	105.6	122.9	114.6	96.3
Link Distance (m)		835.5	835.5			287.9	287.9			92.4	92.4	
Upstream Blk Time (%)						1	0		16	40	16	6
Queuing Penalty (veh)						0	0		0	243	99	0
Storage Bay Dist (m)	25.0			25.0	40.0			25.0	100.0			40.0
Storage Blk Time (%)	54	62	66	11	52	21	33	1	16	40		36
Queuing Penalty (veh)	219	129	145	45	145	63	73	3	42	175		69

Intersection: 33: Bayview Drive & Big Bay Point Road

Movement	SB	SB	SB	B37
Directions Served	T	T	R	T
Maximum Queue (m)	102.3	88.0	56.7	19.9
Average Queue (m)	51.4	41.5	22.9	4.3
95th Queue (m)	98.3	76.8	43.2	26.5
Link Distance (m)	101.3	101.3		41.5
Upstream Blk Time (%)	6	0		4
Queuing Penalty (veh)	0	0		0
Storage Bay Dist (m)			50.0	
Storage Blk Time (%)	9	3	0	
Queuing Penalty (veh)	16	7	0	

Intersection: 39: Bryne Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	B38	NB	NB	NB
Directions Served	L	T	T	TR	L	T	T	TR	T	L	T	TR
Maximum Queue (m)	67.2	98.9	102.5	95.8	54.4	44.6	32.0	22.0	1.5	40.6	39.7	79.9
Average Queue (m)	19.0	49.6	59.4	48.6	34.1	8.1	7.8	6.5	0.1	19.0	18.4	38.9
95th Queue (m)	42.6	86.2	92.1	80.8	52.7	28.3	20.4	17.8	1.1	33.9	34.7	67.7
Link Distance (m)		286.6	286.6	286.6		65.4	65.4	65.4	86.8		97.4	97.4
Upstream Blk Time (%)						0						
Queuing Penalty (veh)						2						
Storage Bay Dist (m)	60.0				50.0					45.0		
Storage Blk Time (%)	0	3			2	0				0	0	
Queuing Penalty (veh)	0	3			10	0				0	0	

Intersection: 39: Bryne Drive & Mapleview Drive W

Movement	SB	SB	SB
Directions Served	L	T	TR
Maximum Queue (m)	31.4	20.6	8.9
Average Queue (m)	11.5	6.0	3.7
95th Queue (m)	25.3	15.8	9.7
Link Distance (m)		172.2	172.2
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)	50.0		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 43: Bryne Road & Harvie Road/Big Bay Point Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	R
Maximum Queue (m)	24.5	88.2	79.2	7.2	67.0	89.3	91.1	42.7	21.8	48.8	41.4	29.1
Average Queue (m)	1.9	57.8	50.3	0.8	30.9	41.6	46.3	6.3	9.6	30.0	16.1	12.5
95th Queue (m)	13.9	82.4	74.9	5.0	61.6	71.0	73.6	23.0	19.6	46.1	34.1	25.0
Link Distance (m)		266.9	266.9			835.5	835.5			283.7	283.7	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	60.0			60.0	60.0			60.0	60.0			60.0
Storage Blk Time (%)		7	3		4	1	2					
Queuing Penalty (veh)		0	0		14	1	1					

Intersection: 43: Bryne Road & Harvie Road/Big Bay Point Road

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (m)	80.0	147.5	121.4	24.8
Average Queue (m)	65.7	65.4	36.4	7.5
95th Queue (m)	91.9	153.2	104.7	18.2
Link Distance (m)		149.6	149.6	
Upstream Blk Time (%)		8	0	
Queuing Penalty (veh)		0	0	
Storage Bay Dist (m)	60.0			60.0
Storage Blk Time (%)	36	0	0	
Queuing Penalty (veh)	62	0	0	

Network Summary

Network wide Queuing Penalty: 3186

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	650	2079	1871	1044	471	588
v/c Ratio	0.87	0.60	0.83	0.66	0.64	0.92
Control Delay	41.6	12.6	21.4	5.0	50.5	66.0
Queue Delay	0.0	1.9	0.0	0.0	0.3	0.0
Total Delay	41.6	14.4	21.4	5.0	50.8	66.0
Queue Length 50th (m)	69.7	166.4	82.1	33.4	59.4	80.3
Queue Length 95th (m)	94.4	178.3	m81.9	m35.7	78.0	#116.9
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	792	3482	2259	1583	765	655
Starvation Cap Reductn	0	1181	0	0	0	0
Spillback Cap Reductn	0	0	0	0	41	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.90	0.83	0.66	0.65	0.90

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)	650	2079	0	0	1871	1044	471	0	588	0	0	0
Future Volume (vph)	650	2079	0	0	1871	1044	471	0	588	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0			6.0	4.0	6.0		6.0			
Lane Util. Factor	0.97	0.91			0.91	1.00	0.97		0.88			
Frpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00			
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)	3433	5036			5085	1583	3433		2733			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3433	5036			5085	1583	3433		2733			
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)	650	2079	0	0	1871	1044	471	0	588	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	46	0	0	0
Lane Group Flow (vph)	650	2079	0	0	1871	1044	471	0	542	0	0	0
Confl. Peds. (#/hr)			3	3								
Heavy Vehicles (%)	2%	3%	0%	0%	2%	2%	2%	0%	4%	0%	0%	0%
Turn Type	Prot	NA			NA	Free	Prot		Perm			
Protected Phases	5	2			6		8					
Permitted Phases						Free			8			
Actuated Green, G (s)	28.1	89.9			57.8	130.0	28.1		28.1			
Effective Green, g (s)	28.1	89.9			57.8	130.0	28.1		28.1			
Actuated g/C Ratio	0.22	0.69			0.44	1.00	0.22		0.22			
Clearance Time (s)	4.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)	742	3482			2260	1583	742		590			
v/s Ratio Prot	c0.19	0.41			c0.37		0.14					
v/s Ratio Perm						0.66			c0.20			
v/c Ratio	0.88	0.60			0.83	0.66	0.63		0.92			
Uniform Delay, d1	49.3	10.5			31.7	0.0	46.3		49.8			
Progression Factor	0.66	1.12			0.62	1.00	1.00		1.00			
Incremental Delay, d2	7.4	0.5			1.2	0.7	1.8		19.3			
Delay (s)	39.8	12.3			20.8	0.7	48.1		69.1			
Level of Service	D	B			C	A	D		E			
Approach Delay (s)		18.8			13.6			59.7			0.0	
Approach LOS		B			B			E			A	

Intersection Summary

HCM 2000 Control Delay	23.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	86.3%	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)	464	1832	67	69	1725	282	659	90	251	50	533
v/c Ratio	1.08	0.91	0.09	0.43	1.06	0.45	0.83	0.21	0.90	0.17	0.93
Control Delay	117.6	26.4	0.4	25.7	65.6	5.1	56.7	33.6	88.4	52.0	61.0
Queue Delay	0.0	0.0	0.0	0.0	15.6	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	117.6	26.4	0.4	25.7	81.2	5.1	56.7	33.6	88.4	52.0	61.0
Queue Length 50th (m)	~70.0	174.6	0.2	6.3	~181.3	4.0	87.0	16.2	67.9	12.0	123.9
Queue Length 95th (m)	m#101.2	#211.6	m0.5	m7.7	#212.5	m6.4	104.7	30.1	#137.2	25.6	#211.4
Internal Link Dist (m)		225.6			141.6			127.2		94.6	
Turn Bay Length (m)	160.0		175.0	50.0			50.0		60.0		
Base Capacity (vph)	431	2009	706	163	1627	630	933	492	278	293	573
Starvation Cap Reductn	0	0	0	0	56	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	1.08	0.91	0.09	0.42	1.10	0.45	0.71	0.18	0.90	0.17	0.93

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)	464	1832	67	69	1725	282	659	65	25	251	50	533
Future Volume (vph)	464	1832	67	69	1725	282	659	65	25	251	50	533
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		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)	3502	4940	1578	1787	5036	1529	3467	1788		1805	1900	1615
Flt Permitted	0.95	1.00	1.00	0.10	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	4940	1578	179	5036	1529	3467	1788		1805	1900	1615
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)	464	1832	67	69	1725	282	659	65	25	251	50	533
RTOR Reduction (vph)	0	0	40	0	0	136	0	12	0	0	0	55
Lane Group Flow (vph)	464	1832	27	69	1725	146	659	78	0	251	50	478
Confl. Peds. (#/hr)	3		1	1		3			2	2		
Heavy Vehicles (%)	0%	5%	1%	1%	3%	4%	1%	2%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases			2	6		6						4
Actuated Green, G (s)	16.0	52.1	52.1	47.9	42.0	42.0	29.9	29.9		20.1	20.1	36.1
Effective Green, g (s)	16.0	52.1	52.1	47.9	42.0	42.0	29.9	29.9		20.1	20.1	36.1
Actuated g/C Ratio	0.12	0.40	0.40	0.37	0.32	0.32	0.23	0.23		0.15	0.15	0.28
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0
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)	431	1979	632	138	1627	493	797	411		279	293	448
v/s Ratio Prot	c0.13	0.37		0.02	c0.34		c0.19	0.04		0.14	0.03	c0.13
v/s Ratio Perm			0.02	0.16		0.10						0.16
v/c Ratio	1.08	0.93	0.04	0.50	1.06	0.30	0.83	0.19		0.90	0.17	1.07
Uniform Delay, d1	57.0	37.1	23.7	30.9	44.0	32.9	47.6	40.3		54.0	47.7	47.0
Progression Factor	1.11	0.53	0.23	1.13	0.70	0.38	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	59.6	7.0	0.1	1.4	34.8	0.8	7.0	0.2		29.0	0.3	61.6
Delay (s)	122.9	26.7	5.4	36.3	65.4	13.4	54.6	40.5		83.0	48.0	108.5
Level of Service	F	C	A	D	E	B	D	D		F	D	F
Approach Delay (s)		44.9			57.4			52.9			97.2	
Approach LOS		D			E			D			F	

Intersection Summary

HCM 2000 Control Delay	57.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	98.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (m)	79.0	82.1	158.9	132.6	95.6	149.0	106.1	79.0	81.8	82.3	78.2	106.2
Average Queue (m)	45.2	43.2	30.5	21.8	24.4	82.4	51.0	49.3	42.9	47.4	46.5	67.3
95th Queue (m)	71.4	71.8	96.2	73.6	69.0	127.0	81.2	68.8	77.4	71.9	70.4	97.4
Link Distance (m)		168.4	168.4	168.4	168.4	218.3	218.3	218.3			335.8	335.8
Upstream Blk Time (%)			0									
Queuing Penalty (veh)			1									
Storage Bay Dist (m)	130.0								130.0	265.0		
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	NB
Directions Served	R
Maximum Queue (m)	90.0
Average Queue (m)	51.9
95th Queue (m)	85.4
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	265.0
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	L
Maximum Queue (m)	94.2	97.2	134.6	105.1	113.8	12.8	57.3	132.6	131.7	145.0	158.1	57.4
Average Queue (m)	57.2	61.6	73.4	60.6	68.8	4.0	17.1	74.2	91.4	114.0	67.0	54.6
95th Queue (m)	87.0	90.7	115.6	95.2	103.9	10.9	45.5	122.0	139.7	155.4	172.7	67.8
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)								0	0	5	5	
Queuing Penalty (veh)								1	1	24	27	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)							0	18				9
Queuing Penalty (veh)							0	13				30

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R
Maximum Queue (m)	137.5	133.3	67.4	100.6	100.6
Average Queue (m)	120.4	41.6	62.6	88.4	92.7
95th Queue (m)	154.8	120.0	81.2	136.1	119.8
Link Distance (m)	128.7	128.7		96.0	96.0
Upstream Blk Time (%)	30	4		53	50
Queuing Penalty (veh)	0	0		0	0
Storage Bay Dist (m)			60.0		
Storage Blk Time (%)	54		70		
Queuing Penalty (veh)	176		35		

Zone Summary

Zone wide Queuing Penalty: 307

HCM Signalized Intersection Capacity Analysis
1: West Terminal

07-25-2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	1885	0	0	2084	0	0	0	0
Future Volume (vph)	0	0	0	0	1885	0	0	2084	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0			6.0				
Lane Util. Factor					0.91			0.91				
Frt					1.00			1.00				
Flt Protected					1.00			1.00				
Satd. Flow (prot)					5193			5142				
Flt Permitted					1.00			1.00				
Satd. Flow (perm)					5193			5142				
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	0	1885	0	0	2084	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1885	0	0	2084	0	0	0	0
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	2%	0%	0%	0%	0%
Turn Type					NA			NA				
Protected Phases					6			8				
Permitted Phases												
Actuated Green, G (s)					56.5			61.5				
Effective Green, g (s)					56.5			61.5				
Actuated g/C Ratio					0.43			0.47				
Clearance Time (s)					6.0			6.0				
Vehicle Extension (s)					3.0			3.0				
Lane Grp Cap (vph)					2256			2432				
v/s Ratio Prot					c0.36			c0.41				
v/s Ratio Perm												
v/c Ratio					0.84			0.86				
Uniform Delay, d1					32.6			30.4				
Progression Factor					0.66			1.00				
Incremental Delay, d2					2.6			3.2				
Delay (s)					24.3			33.6				
Level of Service					C			C				
Approach Delay (s)		0.0			24.3			33.6			0.0	
Approach LOS		A			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	29.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
2: W-N & N-E

07-25-2022

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2084	0	0	644	0
Future Volume (vph)	0	2084	0	0	644	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	
Lane Util. Factor		0.91			0.97	
Frt		1.00			1.00	
Flt Protected		1.00			0.95	
Satd. Flow (prot)		5142			3404	
Flt Permitted		1.00			0.95	
Satd. Flow (perm)		5142			3404	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2084	0	0	644	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	2084	0	0	644	0
Heavy Vehicles (%)	0%	2%	0%	0%	4%	0%
Turn Type		NA			Prot	
Protected Phases		4			6	
Permitted Phases						
Actuated Green, G (s)		62.0			56.0	
Effective Green, g (s)		62.0			56.0	
Actuated g/C Ratio		0.48			0.43	
Clearance Time (s)		6.0			6.0	
Vehicle Extension (s)		3.0			3.0	
Lane Grp Cap (vph)		2452			1466	
v/s Ratio Prot		c0.41			c0.19	
v/s Ratio Perm						
v/c Ratio		0.85			0.44	
Uniform Delay, d1		29.9			26.0	
Progression Factor		0.00			1.00	
Incremental Delay, d2		2.0			1.0	
Delay (s)		2.1			26.9	
Level of Service		A			C	
Approach Delay (s)		2.1	0.0		26.9	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: East Terminal

07-25-2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	2079	0	0	0	0	0	0	0	0	1871	0
Future Volume (vph)	0	2079	0	0	0	0	0	0	0	0	1871	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0									6.0	
Lane Util. Factor		0.91									0.91	
Frt		1.00									1.00	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		5092									5142	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		5092									5142	
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	2079	0	0	0	0	0	0	0	0	1871	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2079	0	0	0	0	0	0	0	0	1871	0
Heavy Vehicles (%)	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%
Turn Type		NA									NA	
Protected Phases		4									2	
Permitted Phases												
Actuated Green, G (s)		59.6									58.4	
Effective Green, g (s)		59.6									58.4	
Actuated g/C Ratio		0.46									0.45	
Clearance Time (s)		6.0									6.0	
Vehicle Extension (s)		3.0									3.0	
Lane Grp Cap (vph)		2334									2309	
v/s Ratio Prot		c0.41									c0.36	
v/s Ratio Perm												
v/c Ratio		0.89									0.81	
Uniform Delay, d1		32.2									31.0	
Progression Factor		0.68									1.00	
Incremental Delay, d2		3.3									3.2	
Delay (s)		25.3									34.2	
Level of Service		C									C	
Approach Delay (s)		25.3			0.0			0.0			34.2	
Approach LOS		C			A			A			C	

Intersection Summary				
HCM 2000 Control Delay	29.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	86.3%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
4: West Terminal/E-S

07-25-2022

Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Traffic Volume (veh/h)	0	0	456	1885	0	0
Future Volume (Veh/h)	0	0	456	1885	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	456	1885	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	67			77		
pX, platoon unblocked					0.68	
vC, conflicting volume			0		1540	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		125	0
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			72		100	100
cM capacity (veh/h)			1607		418	1091

Direction, Lane #	WB 1	WB 2	WB 3
Volume Total	833	754	754
Volume Left	456	0	0
Volume Right	0	0	0
cSH	1607	1700	1700
Volume to Capacity	0.28	0.44	0.44
Queue Length 95th (m)	9.0	0.0	0.0
Control Delay (s)	5.8	0.0	0.0
Lane LOS	A		
Approach Delay (s)	2.1		
Approach LOS			

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: W-S

07-25-2022

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	2084	180	0	0	0	0
Future Volume (Veh/h)	2084	180	0	0	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	2084	180	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				51		
pX, platoon unblocked						
vC, conflicting volume			2264		2084	695
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2264		2084	695
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			229		47	390

Direction, Lane #	EB 1	EB 2	EB 3	EB 4
Volume Total	695	695	695	180
Volume Left	0	0	0	0
Volume Right	0	0	0	180
cSH	1700	1700	1700	1700
Volume to Capacity	0.41	0.41	0.41	0.11
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0			
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	85.0%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
7: N-W

07-25-2022

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	1885	0	0	264
Future Volume (vph)	0	0	1885	0	0	264
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			6.0			6.0
Lane Util. Factor			0.91			0.88
Frt			1.00			0.85
Flt Protected			1.00			1.00
Satd. Flow (prot)			5193			2763
Flt Permitted			1.00			1.00
Satd. Flow (perm)			5193			2763
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	1885	0	0	264
RTOR Reduction (vph)	0	0	0	0	0	2
Lane Group Flow (vph)	0	0	1885	0	0	262
Heavy Vehicles (%)	0%	0%	1%	0%	0%	4%
Turn Type			NA			Prot
Protected Phases			2			8
Permitted Phases						
Actuated Green, G (s)			56.0			62.0
Effective Green, g (s)			56.0			62.0
Actuated g/C Ratio			0.43			0.48
Clearance Time (s)			6.0			6.0
Lane Grp Cap (vph)			2236			1317
v/s Ratio Prot			c0.36			c0.09
v/s Ratio Perm						
v/c Ratio			0.84			0.20
Uniform Delay, d1			33.1			19.6
Progression Factor			0.01			1.00
Incremental Delay, d2			2.2			0.3
Delay (s)			2.4			20.0
Level of Service			A			B
Approach Delay (s)		0.0	2.4		20.0	
Approach LOS		A	A		B	

Intersection Summary			
HCM 2000 Control Delay	4.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
12: E-N

07-25-2022

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (veh/h)	0	0	1871	1044	0	0
Future Volume (Veh/h)	0	0	1871	1044	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	1871	1044	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		32				
pX, platoon unblocked						
vC, conflicting volume	2915				1871	624
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2915				1871	624
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	127				65	433

Direction, Lane #	WB 1	WB 2	WB 3	WB 4
Volume Total	624	624	624	1044
Volume Left	0	0	0	0
Volume Right	0	0	0	1044
cSH	1700	1700	1700	1700
Volume to Capacity	0.37	0.37	0.37	0.61
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0			
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	86.3%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
14: S-E

07-25-2022

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2079	0	0	0	0	588
Future Volume (vph)	2079	0	0	0	0	588
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0					6.0
Lane Util. Factor	0.91					0.88
Frt	1.00					0.85
Flt Protected	1.00					1.00
Satd. Flow (prot)	5092					2763
Flt Permitted	1.00					1.00
Satd. Flow (perm)	5092					2763
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	2079	0	0	0	0	588
RTOR Reduction (vph)	0	0	0	0	0	2
Lane Group Flow (vph)	2079	0	0	0	0	586
Heavy Vehicles (%)	3%	0%	0%	0%	0%	4%
Turn Type	NA					Perm
Protected Phases	4					
Permitted Phases						2
Actuated Green, G (s)	61.0					57.0
Effective Green, g (s)	61.0					57.0
Actuated g/C Ratio	0.47					0.44
Clearance Time (s)	6.0					6.0
Lane Grp Cap (vph)	2389					1211
v/s Ratio Prot	c0.41					
v/s Ratio Perm						c0.21
v/c Ratio	0.87					0.48
Uniform Delay, d1	30.9					26.0
Progression Factor	0.00					1.00
Incremental Delay, d2	2.3					1.4
Delay (s)	2.3					27.4
Level of Service	A					C
Approach Delay (s)	2.3			0.0	27.4	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	86.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
16: W-N/East Terminal

07-25-2022

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Traffic Volume (veh/h)	650	2079	0	0	0	0
Future Volume (Veh/h)	650	2079	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	650	2079	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		75	74			
pX, platoon unblocked					0.65	
vC, conflicting volume	0				1993	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				613	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	60				100	100
cM capacity (veh/h)	1622				166	1091

Direction, Lane #	EB 1	EB 2	EB 3
Volume Total	1066	832	832
Volume Left	650	0	0
Volume Right	0	0	0
cSH	1622	1700	1700
Volume to Capacity	0.40	0.49	0.49
Queue Length 95th (m)	15.0	0.0	0.0
Control Delay (s)	7.1	0.0	0.0
Lane LOS	A		
Approach Delay (s)	2.8		
Approach LOS			

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	124.7%	ICU Level of Service	H
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
17: S-W & E-S

07-25-2022

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1871	471	0
Future Volume (vph)	0	0	0	1871	471	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.0	6.0	
Lane Util. Factor				0.91	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				5142	3471	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				5142	3471	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	1871	471	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	1871	471	0
Heavy Vehicles (%)	0%	0%	0%	2%	2%	0%
Turn Type				NA	Prot	
Protected Phases				8	2	
Permitted Phases						
Actuated Green, G (s)				57.0	61.0	
Effective Green, g (s)				57.0	61.0	
Actuated g/C Ratio				0.44	0.47	
Clearance Time (s)				6.0	6.0	
Vehicle Extension (s)				3.0	3.0	
Lane Grp Cap (vph)				2254	1628	
v/s Ratio Prot				c0.36	c0.14	
v/s Ratio Perm						
v/c Ratio				0.83	0.29	
Uniform Delay, d1				32.2	21.2	
Progression Factor				0.03	1.00	
Incremental Delay, d2				2.1	0.4	
Delay (s)				3.1	21.6	
Level of Service				A	C	
Approach Delay (s)	0.0			3.1	21.6	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 1: West Terminal

Movement	WB	WB	WB	NE	NE	NE
Directions Served	T	T	T	T	T	T
Maximum Queue (m)	51.3	55.7	48.5	35.7	40.6	46.1
Average Queue (m)	41.3	46.1	45.0	30.0	30.0	31.1
95th Queue (m)	50.4	49.4	47.9	33.1	36.4	39.0
Link Distance (m)	18.6	18.6	18.6	25.6	25.6	25.6
Upstream Blk Time (%)	45	57	57	57	42	47
Queuing Penalty (veh)	283	359	358	396	291	327
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: W-N & N-E

Movement	EB	EB	EB	SB	SB
Directions Served	T	T	T	L	L
Maximum Queue (m)	33.8	35.6	34.7	64.9	60.2
Average Queue (m)	23.0	12.2	14.8	55.5	41.0
95th Queue (m)	34.3	28.3	30.7	66.2	56.8
Link Distance (m)	22.8	22.8	22.8	37.0	37.0
Upstream Blk Time (%)	7	6	12	28	12
Queuing Penalty (veh)	51	43	81	92	39
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: East Terminal

Movement	EB	EB	EB	SW	SW	SW
Directions Served	T	T	T	T	T	T
Maximum Queue (m)	69.0	66.7	63.9	44.9	43.5	44.1
Average Queue (m)	59.4	57.7	56.1	36.4	36.8	35.7
95th Queue (m)	65.7	63.3	62.9	40.6	39.7	44.7
Link Distance (m)	27.3	27.3	27.3	19.8	19.8	19.8
Upstream Blk Time (%)	42	47	51	63	57	45
Queuing Penalty (veh)	291	325	350	393	356	282
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: West Terminal/E-S

Movement	WB	WB	WB
Directions Served	LT	T	T
Maximum Queue (m)	72.6	74.4	78.5
Average Queue (m)	56.8	52.9	47.4
95th Queue (m)	81.3	81.5	81.1
Link Distance (m)	59.5	59.5	59.5
Upstream Blk Time (%)	22	14	13
Queuing Penalty (veh)	174	108	105
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: W-S

Movement	EB	EB	EB	EB
Directions Served	T	T	T	R
Maximum Queue (m)	192.1	191.2	186.0	183.3
Average Queue (m)	182.5	180.8	158.9	91.2
95th Queue (m)	187.5	191.4	212.1	237.4
Link Distance (m)	176.8	176.8	176.8	176.8
Upstream Blk Time (%)	80	60	14	10
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: N-W

Movement	WB	WB	WB	SB	SB
Directions Served	T	T	T	R	R
Maximum Queue (m)	8.0	21.3	20.0	52.0	37.4
Average Queue (m)	1.6	10.9	10.9	27.6	15.9
95th Queue (m)	6.7	20.4	20.6	46.6	36.4
Link Distance (m)	7.7	7.7	7.7	37.4	37.4
Upstream Blk Time (%)	7	44	43	2	0
Queuing Penalty (veh)	44	273	269	3	0
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 12: E-N

Movement	WB	WB	WB	WB
Directions Served	T	T	T	R
Maximum Queue (m)	198.1	191.4	185.7	156.0
Average Queue (m)	172.2	157.1	112.7	56.0
95th Queue (m)	217.6	212.5	209.5	199.2
Link Distance (m)	187.5	187.5	187.5	187.5
Upstream Blk Time (%)	22	13	8	6
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 14: S-E

Movement	EB	EB	EB	NB	NB
Directions Served	T	T	T	R	R
Maximum Queue (m)	2.9	11.7	21.1	73.7	54.1
Average Queue (m)	0.3	2.1	9.0	54.4	39.7
95th Queue (m)	2.7	8.3	18.4	75.8	59.4
Link Distance (m)	20.9	20.9	20.9	48.7	48.7
Upstream Blk Time (%)		0	2	12	2
Queuing Penalty (veh)		2	13	36	5
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 16: W-N/East Terminal

Movement	EB	EB	EB
Directions Served	LT	T	T
Maximum Queue (m)	76.5	81.5	76.7
Average Queue (m)	50.9	42.9	36.1
95th Queue (m)	77.2	81.8	78.1
Link Distance (m)	54.6	54.6	54.6
Upstream Blk Time (%)	7	4	3
Queuing Penalty (veh)	67	36	30
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 17: S-W & E-S

Movement	WB	WB	WB	NB	NB
Directions Served	T	T	T	L	L
Maximum Queue (m)	35.2	40.5	36.9	65.8	57.9
Average Queue (m)	20.7	21.1	16.9	53.8	39.1
95th Queue (m)	37.3	40.3	38.5	70.8	61.9
Link Distance (m)	31.8	31.8	31.8	39.6	39.6
Upstream Blk Time (%)	1	2	1	43	14
Queuing Penalty (veh)	7	14	9	101	33
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 5645

Appendix H

2036 Background Synchro Analysis

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	1280	382	2065	5	4	160	262	38
v/c Ratio	0.16	0.45	0.70	0.69	0.03	0.03	0.59	0.78	0.05
Control Delay	6.9	4.4	59.6	7.8	31.4	47.8	13.6	54.3	29.6
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	6.9	4.4	59.6	7.9	31.4	47.8	13.6	54.3	29.6
Queue Length 50th (m)	0.4	7.7	45.1	54.6	0.9	0.9	0.0	53.7	2.7
Queue Length 95th (m)	m0.7	9.3	m59.7	81.3	3.8	4.4	13.7	#78.3	7.8
Internal Link Dist (m)		85.3		118.2		85.0			175.8
Turn Bay Length (m)	70.0		65.0		20.0			40.0	
Base Capacity (vph)	176	2863	597	2982	193	310	412	336	837
Starvation Cap Reductn	0	0	0	185	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	0.16	0.45	0.64	0.74	0.03	0.01	0.39	0.78	0.05

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)	28	1273	7	382	1725	340	5	4	160	262	29	9
Future Volume (vph)	28	1273	7	382	1725	340	5	4	160	262	29	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0	6.0	4.0	6.0	
Lane Util. Factor	1.00	0.86		0.97	0.91		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.99	1.00	
Frt	1.00	1.00		1.00	0.98		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	6048		3467	4860		1733	1900	1560	1742	3462	
Flt Permitted	0.08	1.00		0.95	1.00		0.73	1.00	1.00	0.54	1.00	
Satd. Flow (perm)	155	6048		3467	4860		1334	1900	1560	986	3462	
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)	28	1273	7	382	1725	340	5	4	160	262	29	9
RTOR Reduction (vph)	0	1	0	0	22	0	0	0	146	0	7	0
Lane Group Flow (vph)	28	1279	0	382	2043	0	5	4	14	262	31	0
Confl. Peds. (#/hr)	2					2	1		7	7		1
Heavy Vehicles (%)	0%	8%	3%	1%	4%	3%	4%	0%	1%	3%	0%	1%
Turn Type	pm+pt	NA		Prot	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2						8		8	4		
Actuated Green, G (s)	52.7	48.9		17.2	62.3		11.0	9.9	9.9	27.9	22.8	
Effective Green, g (s)	52.7	48.9		17.2	62.3		11.0	9.9	9.9	27.9	22.8	
Actuated g/C Ratio	0.48	0.44		0.16	0.57		0.10	0.09	0.09	0.25	0.21	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0	6.0	4.0	6.0	
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)	131	2688		542	2752		137	171	140	346	717	
v/s Ratio Prot	0.01	0.21		c0.11	c0.42		0.00	0.00		c0.10	0.01	
v/s Ratio Perm	0.09						0.00		0.01	c0.10		
v/c Ratio	0.21	0.48		0.70	0.74		0.04	0.02	0.10	0.76	0.04	
Uniform Delay, d1	16.4	21.5		44.0	17.8		44.7	45.6	46.0	36.3	34.9	
Progression Factor	0.67	0.20		1.24	0.44		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	0.5		3.2	1.4		0.1	0.1	0.3	9.1	0.0	
Delay (s)	11.5	4.7		57.5	9.3		44.8	45.7	46.3	45.4	34.9	
Level of Service	B	A		E	A		D	D	D	D	C	
Approach Delay (s)		4.9			16.8			46.2			44.1	
Approach LOS		A			B			D			D	

Intersection Summary

HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	1496	198	433	1725	675	723
v/c Ratio	0.75	0.34	0.94	0.58	0.69	0.86
Control Delay	23.6	4.0	46.2	9.2	38.4	44.2
Queue Delay	0.0	0.0	0.0	0.3	0.0	0.0
Total Delay	23.6	4.0	46.2	9.4	38.4	44.2
Queue Length 50th (m)	97.5	4.6	66.5	88.9	67.6	77.7
Queue Length 95th (m)	#93.7	m6.0	#133.8	118.1	86.7	103.1
Internal Link Dist (m)	118.2			168.8		
Turn Bay Length (m)		45.0	135.0		300.0	300.0
Base Capacity (vph)	1996	584	505	2966	1071	916
Starvation Cap Reductn	0	0	0	498	0	0
Spillback Cap Reductn	0	0	0	86	0	1
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.34	0.86	0.70	0.63	0.79

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)	0	1496	198	433	1725	0	0	0	0	675	0	723
Future Volume (vph)	0	1496	198	433	1725	0	0	0	0	675	0	723
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	4.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	1.00	0.91					0.97		0.88
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		6225	1538	1626	4940					3367		2733
Flt Permitted		1.00	1.00	0.10	1.00					0.95		1.00
Satd. Flow (perm)		6225	1538	174	4940					3367		2733
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	1496	198	433	1725	0	0	0	0	675	0	723
RTOR Reduction (vph)	0	0	91	0	0	0	0	0	0	0	0	49
Lane Group Flow (vph)	0	1496	107	433	1725	0	0	0	0	675	0	674
Heavy Vehicles (%)	0%	5%	5%	11%	5%	0%	0%	0%	0%	4%	0%	4%
Turn Type		NA	Perm	pm+pt	NA					Prot		Perm
Protected Phases		2		1	6					4		
Permitted Phases			2	6								4
Actuated Green, G (s)		35.3	35.3	66.1	66.1					31.9		31.9
Effective Green, g (s)		35.3	35.3	66.1	66.1					31.9		31.9
Actuated g/C Ratio		0.32	0.32	0.60	0.60					0.29		0.29
Clearance Time (s)		6.0	6.0	4.0	6.0					6.0		6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		3.0
Lane Grp Cap (vph)		1997	493	458	2968					976		792
v/s Ratio Prot		0.24		c0.23	0.35					0.20		
v/s Ratio Perm			0.07	c0.34								c0.25
v/c Ratio		0.75	0.22	0.95	0.58					0.69		0.85
Uniform Delay, d1		33.4	27.3	31.4	13.5					34.7		36.8
Progression Factor		0.59	0.22	0.72	0.60					1.00		1.00
Incremental Delay, d2		2.3	0.9	23.8	0.6					2.1		8.7
Delay (s)		22.1	7.0	46.3	8.8					36.8		45.5
Level of Service		C	A	D	A					D		D
Approach Delay (s)		20.3			16.3			0.0			41.3	
Approach LOS		C			B			A			D	

Intersection Summary

HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	314	1856	1695	761	464	239
v/c Ratio	0.70	0.53	0.66	0.69	0.74	0.43
Control Delay	38.9	8.7	9.8	7.4	49.0	29.1
Queue Delay	0.0	0.4	0.0	1.1	0.0	0.0
Total Delay	38.9	9.0	9.8	8.5	49.0	29.1
Queue Length 50th (m)	23.6	112.8	29.0	9.9	51.4	19.0
Queue Length 95th (m)	m36.8	129.5	m41.2	m31.0	65.0	30.5
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	483	3514	2556	1108	825	703
Starvation Cap Reductn	0	940	0	154	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	0.72	0.66	0.80	0.56	0.34

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)	314	1856	0	0	1695	761	464	0	239	0	0	0
Future Volume (vph)	314	1856	0	0	1695	761	464	0	239	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0			6.0	6.0	6.0		6.0			
Lane Util. Factor	0.97	0.91			0.91	1.00	0.97		0.88			
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)	3213	5036			4893	1468	3242		2561			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3213	5036			4893	1468	3242		2561			
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	1856	0	0	1695	761	464	0	239	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	342	0	0	56	0	0	0
Lane Group Flow (vph)	314	1856	0	0	1695	419	464	0	183	0	0	0
Heavy Vehicles (%)	9%	3%	0%	0%	6%	10%	8%	0%	11%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Prot		Perm			
Protected Phases	5	2			6		8					
Permitted Phases						6			8			
Actuated Green, G (s)	15.3	76.8			57.5	57.5	21.2		21.2			
Effective Green, g (s)	15.3	76.8			57.5	57.5	21.2		21.2			
Actuated g/C Ratio	0.14	0.70			0.52	0.52	0.19		0.19			
Clearance Time (s)	4.0	6.0			6.0	6.0	6.0		6.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0			
Lane Grp Cap (vph)	446	3516			2557	767	624		493			
v/s Ratio Prot	c0.10	0.37			c0.35		c0.14					
v/s Ratio Perm						0.29			0.07			
v/c Ratio	0.70	0.53			0.66	0.55	0.74		0.37			
Uniform Delay, d1	45.2	7.9			19.2	17.5	41.8		38.6			
Progression Factor	0.72	0.97			0.45	2.53	1.00		1.00			
Incremental Delay, d2	3.5	0.4			0.6	1.2	4.8		0.5			
Delay (s)	36.2	8.1			9.2	45.5	46.6		39.1			
Level of Service	D	A			A	D	D		D			
Approach Delay (s)		12.2			20.5			44.1			0.0	
Approach LOS		B			C			D			A	

Intersection Summary

HCM 2000 Control Delay	20.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	82.6%	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	SBR
Lane Group Flow (vph)	321	1564	30	13	2100	90	180	40	27	10	178
v/c Ratio	0.54	0.50	0.03	0.05	0.98	0.12	0.50	0.20	0.19	0.07	0.62
Control Delay	68.0	2.5	0.1	3.9	22.9	0.1	51.2	23.7	49.7	46.5	16.9
Queue Delay	0.0	0.0	0.0	0.0	40.5	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.0	2.5	0.1	3.9	63.4	0.1	51.2	23.7	49.7	46.5	16.9
Queue Length 50th (m)	40.0	11.7	0.0	0.4	42.5	0.0	20.2	2.5	5.9	2.2	0.0
Queue Length 95th (m)	55.4	21.0	m0.0	m0.6	m#188.1	m0.0	30.7	12.9	14.3	7.5	20.7
Internal Link Dist (m)		225.6			141.6			127.2		94.6	
Turn Bay Length (m)	160.0		175.0	50.0			50.0		60.0		
Base Capacity (vph)	598	3104	983	254	2135	721	835	427	139	146	287
Starvation Cap Reductn	0	0	0	0	290	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	0.54	0.50	0.03	0.05	1.14	0.12	0.22	0.09	0.19	0.07	0.62

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)	321	1564	30	13	2100	90	180	12	28	27	10	178
Future Volume (vph)	321	1564	30	13	2100	90	180	12	28	27	10	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90		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)	3367	4893	1476	1805	4848	1475	3467	1685		1805	1900	1599
Flt Permitted	0.95	1.00	1.00	0.15	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3367	4893	1476	288	4848	1475	3467	1685		1805	1900	1599
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)	321	1564	30	13	2100	90	180	12	28	27	10	178
RTOR Reduction (vph)	0	0	12	0	0	50	0	25	0	0	0	164
Lane Group Flow (vph)	321	1564	18	13	2100	40	180	15	0	27	10	14
Confl. Peds. (#/hr)	2		1	1		2			1	1		
Heavy Vehicles (%)	4%	6%	8%	0%	7%	8%	1%	0%	0%	0%	0%	1%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2	6		6						4
Actuated Green, G (s)	19.6	66.6	66.6	49.8	48.4	48.4	11.5	11.5		8.5	8.5	8.5
Effective Green, g (s)	19.6	66.6	66.6	49.8	48.4	48.4	11.5	11.5		8.5	8.5	8.5
Actuated g/C Ratio	0.18	0.61	0.61	0.45	0.44	0.44	0.10	0.10		0.08	0.08	0.08
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	599	2962	893	149	2133	649	362	176		139	146	123
v/s Ratio Prot	c0.10	0.32		0.00	c0.43		c0.05	0.01		c0.01	0.01	
v/s Ratio Perm			0.01	0.04		0.03						0.01
v/c Ratio	0.54	0.53	0.02	0.09	0.98	0.06	0.50	0.08		0.19	0.07	0.11
Uniform Delay, d1	41.1	12.6	8.7	16.6	30.4	17.7	46.5	44.5		47.5	47.1	47.2
Progression Factor	1.54	0.16	1.00	0.46	0.47	0.01	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.8	0.6	0.0	0.1	7.0	0.0	1.1	0.2		0.7	0.2	0.4
Delay (s)	63.9	2.7	8.7	7.8	21.3	0.1	47.6	44.7		48.2	47.3	47.6
Level of Service	E	A	A	A	C	A	D	D		D	D	D
Approach Delay (s)		13.0			20.4			47.1			47.7	
Approach LOS		B			C			D			D	

Intersection Summary

HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	75.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	411	904	303	62	1754	108	67	368	184	487
v/c Ratio	0.92	0.42	0.38	0.20	1.04	0.53	0.08	0.82	0.21	0.94
Control Delay	83.5	20.4	5.6	15.8	69.9	59.7	12.9	46.3	30.7	51.8
Queue Delay	0.0	0.0	0.0	0.0	23.3	0.0	0.0	0.0	0.0	0.8
Total Delay	83.5	20.4	5.6	15.8	93.2	59.7	12.9	46.3	30.7	52.6
Queue Length 50th (m)	~56.0	32.0	3.6	6.9	~157.0	12.3	1.9	60.8	16.2	69.0
Queue Length 95th (m)	#92.4	45.0	27.0	14.2	#188.4	21.8	7.3	#106.0	25.5	#133.3
Internal Link Dist (m)		141.6			238.0		219.7		226.0	
Turn Bay Length (m)	70.0		50.0	120.0		95.0		110.0		45.0
Base Capacity (vph)	449	2166	805	313	1681	205	958	448	975	554
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	233	0	0	0	0	8
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.42	0.38	0.20	1.21	0.53	0.07	0.82	0.19	0.89

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)	411	904	303	62	1608	146	108	23	44	368	184	487
Future Volume (vph)	411	904	303	62	1608	146	108	23	44	368	184	487
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3213	4988	1458	1719	4900		3019	3095		1626	3252	1417
Flt Permitted	0.95	1.00	1.00	0.30	1.00		0.95	1.00		0.61	1.00	1.00
Satd. Flow (perm)	3213	4988	1458	548	4900		3019	3095		1053	3252	1417
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)	411	904	303	62	1608	146	108	23	44	368	184	487
RTOR Reduction (vph)	0	0	177	0	10	0	0	34	0	0	0	133
Lane Group Flow (vph)	411	904	126	62	1744	0	108	33	0	368	184	354
Confl. Peds. (#/hr)	1		3	3		1						
Heavy Vehicles (%)	9%	4%	9%	5%	4%	9%	16%	15%	0%	11%	11%	14%
Turn Type	Prot	NA	Perm	pm+pt	NA		Prot	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)	15.4	45.8	45.8	42.2	36.3		7.4	25.6		42.3	30.9	30.9
Effective Green, g (s)	15.4	45.8	45.8	42.2	36.3		7.4	25.6		42.3	30.9	30.9
Actuated g/C Ratio	0.14	0.42	0.42	0.38	0.33		0.07	0.23		0.38	0.28	0.28
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
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)	449	2076	607	273	1617		203	720		471	913	398
v/s Ratio Prot	c0.13	0.18		0.01	c0.36		0.04	0.01		c0.09	0.06	
v/s Ratio Perm			0.09	0.07						0.21		c0.25
v/c Ratio	0.92	0.44	0.21	0.23	1.08		0.53	0.05		0.78	0.20	0.89
Uniform Delay, d1	46.7	22.9	20.5	21.7	36.9		49.6	32.7		28.7	30.1	37.9
Progression Factor	1.30	0.86	1.61	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	23.7	0.6	0.7	0.4	46.9		2.7	0.0		8.2	0.1	20.7
Delay (s)	84.1	20.3	33.6	22.1	83.7		52.3	32.8		36.9	30.3	58.6
Level of Service	F	C	C	C	F		D	C		D	C	E
Approach Delay (s)		39.0			81.6			44.8			45.9	
Approach LOS		D			F			D			D	

Intersection Summary

HCM 2000 Control Delay	57.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	69	15	6	60	519	7	1040
v/c Ratio	0.21	0.11	0.01	0.17	0.20	0.01	0.47
Control Delay	14.7	35.5	0.0	5.0	5.8	4.3	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.7	35.5	0.0	5.0	5.8	4.3	10.8
Queue Length 50th (m)	0.4	2.6	0.0	2.0	11.3	0.3	48.4
Queue Length 95th (m)	7.5	8.3	0.0	7.3	36.4	1.7	86.8
Internal Link Dist (m)	115.4		50.9		226.0		199.1
Turn Bay Length (m)				70.0		50.0	
Base Capacity (vph)	723	136	729	362	2585	728	2211
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.11	0.01	0.17	0.20	0.01	0.47

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	0	33	15	0	6	60	500	19	7	991	49
Future Volume (vph)	36	0	33	15	0	6	60	500	19	7	991	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor		0.95		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.93		1.00	0.85		1.00	0.99		1.00	0.99	
Flt Protected		0.97		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3130		1203	1615		1517	3394		1805	3186	
Flt Permitted		0.82		0.47	1.00		0.22	1.00		0.46	1.00	
Satd. Flow (perm)		2644		592	1615		357	3394		874	3186	
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)	36	0	33	15	0	6	60	500	19	7	991	49
RTOR Reduction (vph)	0	59	0	0	5	0	0	2	0	0	2	0
Lane Group Flow (vph)	0	10	0	15	1	0	60	517	0	7	1038	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	1%	0%	8%	50%	0%	0%	19%	6%	0%	0%	13%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		7.7		14.3	14.3		77.3	72.0		69.2	67.9	
Effective Green, g (s)		7.7		14.3	14.3		77.3	72.0		69.2	67.9	
Actuated g/C Ratio		0.07		0.14	0.14		0.75	0.69		0.67	0.66	
Clearance Time (s)		6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		196		97	222		326	2358		595	2088	
v/s Ratio Prot				c0.00	0.00		c0.01	0.15		0.00	c0.33	
v/s Ratio Perm		0.00		c0.02			0.13			0.01		
v/c Ratio		0.05		0.15	0.00		0.18	0.22		0.01	0.50	
Uniform Delay, d1		44.6		39.1	38.5		4.5	5.7		5.7	9.1	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1		0.7	0.0		0.3	0.2		0.0	0.8	
Delay (s)		44.7		39.8	38.5		4.8	5.9		5.7	10.0	
Level of Service		D		D	D		A	A		A	A	
Approach Delay (s)		44.7			39.4			5.8			9.9	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	103.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	68.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	WBL	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	39	25	6	50	491	6	1071
v/c Ratio	0.18	0.07	0.04	0.11	0.17	0.01	0.42
Control Delay	37.6	0.4	45.0	3.5	4.5	3.5	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.6	0.4	45.0	3.5	4.5	3.5	7.9
Queue Length 50th (m)	6.8	0.0	1.1	1.6	10.7	0.3	49.9
Queue Length 95th (m)	16.3	0.0	5.5	6.2	34.5	1.5	89.4
Internal Link Dist (m)					199.1		252.7
Turn Bay Length (m)	25.0			70.0		70.0	
Base Capacity (vph)	234	423	160	497	2810	816	2549
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.06	0.04	0.10	0.17	0.01	0.42

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	0	25	6	0	0	50	491	0	6	1018	53
Future Volume (vph)	39	0	25	6	0	0	50	491	0	6	1018	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		6.0	4.0			4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00		1.00	1.00			1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Frt	1.00		0.85	1.00			1.00	1.00		1.00	0.99	
Flt Protected	0.95		1.00	0.95			0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1687		961	1805			1805	3406		1805	3272	
Flt Permitted	0.95		1.00	0.00			0.23	1.00		0.47	1.00	
Satd. Flow (perm)	1687		961	0			433	3406		898	3272	
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	0	25	6	0	0	50	491	0	6	1018	53
RTOR Reduction (vph)	0	0	24	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	39	0	1	6	0	0	50	491	0	6	1069	0
Confl. Peds. (#/hr)	1											
Heavy Vehicles (%)	7%	0%	68%	0%	0%	0%	0%	6%	0%	0%	10%	0%
Turn Type	pm+pt		Perm	pm+pt			pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	12.8		5.6	1.2			76.5	72.6		71.1	69.9	
Effective Green, g (s)	12.8		5.6	1.2			76.5	72.6		71.1	69.9	
Actuated g/C Ratio	0.13		0.06	0.01			0.76	0.72		0.71	0.69	
Clearance Time (s)	4.0		6.0	4.0			4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0			3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	214		53	21			382	2458		645	2273	
v/s Ratio Prot	c0.02			0.00			c0.01	0.14		0.00	c0.33	
v/s Ratio Perm			0.00				0.09			0.01		
v/c Ratio	0.18		0.03	0.29			0.13	0.20		0.01	0.47	
Uniform Delay, d1	39.2		44.9	49.3			3.6	4.6		4.3	7.0	
Progression Factor	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4		0.2	7.4			0.2	0.2		0.0	0.7	
Delay (s)	39.6		45.1	56.6			3.8	4.7		4.3	7.7	
Level of Service	D		D	E			A	A		A	A	
Approach Delay (s)		41.8			56.6			4.6			7.6	
Approach LOS		D			E			A			A	

Intersection Summary

HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	100.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	33	23	36	198	30	431	77	1057
v/c Ratio	0.16	0.06	0.14	0.34	0.13	0.21	0.12	0.50
Control Delay	37.3	0.3	34.2	1.6	6.3	10.1	5.3	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.3	0.3	34.2	1.6	6.3	10.1	5.3	12.2
Queue Length 50th (m)	6.8	0.0	6.1	0.0	1.7	22.1	4.5	69.2
Queue Length 95th (m)	14.0	0.0	15.0	0.0	4.8	32.9	9.6	93.1
Internal Link Dist (m)				203.0		252.7		204.9
Turn Bay Length (m)	50.0	50.0	30.0		70.0		65.0	
Base Capacity (vph)	221	582	258	684	245	2097	667	2119
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	0.15	0.04	0.14	0.29	0.12	0.21	0.12	0.50

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	0	23	36	0	198	30	430	1	77	1017	40
Future Volume (vph)	33	0	23	36	0	198	30	430	1	77	1017	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00		1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00		0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00		0.85	1.00	0.85		1.00	1.00		1.00	0.99	
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805		1593	1734	1346		1031	3404		1624	3302	
Flt Permitted	0.48		1.00	0.56	1.00		0.23	1.00		0.49	1.00	
Satd. Flow (perm)	905		1593	1028	1346		245	3404		834	3302	
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)	33	0	23	36	0	198	30	430	1	77	1017	40
RTOR Reduction (vph)	0	0	21	0	176	0	0	0	0	0	2	0
Lane Group Flow (vph)	33	0	2	36	22	0	30	431	0	77	1055	0
Confl. Peds. (#/hr)			1	1			5		4	4		5
Heavy Vehicles (%)	0%	0%	0%	4%	0%	20%	75%	6%	4%	11%	9%	0%
Turn Type	pm+pt		Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	12.9		8.4	18.7	11.3		65.6	61.5		69.0	63.2	
Effective Green, g (s)	12.9		8.4	18.7	11.3		65.6	61.5		69.0	63.2	
Actuated g/C Ratio	0.13		0.08	0.18	0.11		0.64	0.60		0.67	0.61	
Clearance Time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	152		129	237	147		187	2030		602	2024	
v/s Ratio Prot	c0.01			c0.01	0.02		0.01	0.13		c0.01	c0.32	
v/s Ratio Perm	c0.02		0.00	0.02			0.10			0.08		
v/c Ratio	0.22		0.01	0.15	0.15		0.16	0.21		0.13	0.52	
Uniform Delay, d1	40.2		43.5	35.3	41.5		7.6	9.6		5.9	11.3	
Progression Factor	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7		0.0	0.3	0.5		0.4	0.2		0.1	1.0	
Delay (s)	40.9		43.6	35.6	42.0		8.0	9.8		6.0	12.3	
Level of Service	D		D	D	D		A	A		A	B	
Approach Delay (s)		42.0			41.0			9.7			11.9	
Approach LOS		D			D			A			B	

Intersection Summary

HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	103.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	0	3	14	0	7	9	578	56	15	944	26
Future Volume (Veh/h)	6	0	3	14	0	7	9	578	56	15	944	26
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	6	0	3	14	0	7	9	578	56	15	944	26
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								229				
pX, platoon unblocked	0.98	0.98		0.98	0.98	0.98				0.98		
vC, conflicting volume	1301	1639	485	1129	1624	317	970			634		
vC1, stage 1 conf vol	987	987		624	624							
vC2, stage 2 conf vol	314	652		505	1000							
vCu, unblocked vol	1260	1606	485	1084	1591	252	970			577		
tC, single (s)	7.5	6.5	6.9	8.3	6.5	6.9	4.1			4.2		
tC, 2 stage (s)	6.5	5.5		7.3	5.5							
tF (s)	3.5	4.0	3.3	3.9	4.0	3.3	2.2			2.3		
p0 queue free %	98	100	99	95	100	99	99			98		
cM capacity (veh/h)	248	270	528	296	267	736	706			943		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	9	21	9	385	249	15	629	341
Volume Left	6	14	9	0	0	15	0	0
Volume Right	3	7	0	0	56	0	0	26
cSH	302	369	706	1700	1700	943	1700	1700
Volume to Capacity	0.03	0.06	0.01	0.23	0.15	0.02	0.37	0.20
Queue Length 95th (m)	0.7	1.4	0.3	0.0	0.0	0.4	0.0	0.0
Control Delay (s)	17.3	15.3	10.2	0.0	0.0	8.9	0.0	0.0
Lane LOS	C	C	B			A		
Approach Delay (s)	17.3	15.3	0.1			0.1		
Approach LOS	C	C						

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	36.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	27	25	102	487	960	113
Future Volume (Veh/h)	27	25	102	487	960	113
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	27	25	102	487	960	113
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)					276	
pX, platoon unblocked	0.98	0.98	0.98			
vC, conflicting volume	1464	536	1073			
vC1, stage 1 conf vol	1016					
vC2, stage 2 conf vol	448					
vCu, unblocked vol	1434	489	1036			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	95	85			
cM capacity (veh/h)	283	520	666			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	27	25	102	244	244	640	433
Volume Left	27	0	102	0	0	0	0
Volume Right	0	25	0	0	0	0	113
cSH	283	520	666	1700	1700	1700	1700
Volume to Capacity	0.10	0.05	0.15	0.14	0.14	0.38	0.25
Queue Length 95th (m)	2.5	1.2	4.3	0.0	0.0	0.0	0.0
Control Delay (s)	19.0	12.3	11.4	0.0	0.0	0.0	0.0
Lane LOS	C	B	B				
Approach Delay (s)	15.8		2.0			0.0	
Approach LOS	C						

Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	49.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	6	25	477	1053	26
Future Volume (Veh/h)	9	6	25	477	1053	26
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	9	6	25	477	1053	26
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)					122	
pX, platoon unblocked	0.95	0.95	0.95			
vC, conflicting volume	1354	540	1079			
vC1, stage 1 conf vol	1066					
vC2, stage 2 conf vol	288					
vCu, unblocked vol	1272	416	983			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	99	96			
cM capacity (veh/h)	299	563	677			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	15	25	238	238	702	377
Volume Left	9	25	0	0	0	0
Volume Right	6	0	0	0	0	26
cSH	368	677	1700	1700	1700	1700
Volume to Capacity	0.04	0.04	0.14	0.14	0.41	0.22
Queue Length 95th (m)	1.0	0.9	0.0	0.0	0.0	0.0
Control Delay (s)	15.2	10.5	0.0	0.0	0.0	0.0
Lane LOS	C	B				
Approach Delay (s)	15.2	0.5			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	39.9%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	143	669	421	410	667	243	114	364	54	246	303
v/c Ratio	0.40	0.64	0.68	0.86	0.48	0.33	0.31	0.39	0.16	0.28	0.58
Control Delay	17.8	37.9	23.5	36.1	25.3	9.4	28.2	34.9	26.0	35.4	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
Total Delay	17.8	37.9	23.5	36.1	25.3	9.4	28.2	34.9	26.0	35.4	8.9
Queue Length 50th (m)	15.7	71.4	43.4	54.5	59.4	13.0	17.8	36.1	8.1	24.3	0.0
Queue Length 95th (m)	26.3	97.3	85.4	#94.7	76.3	30.9	33.8	53.9	18.3	38.1	26.1
Internal Link Dist (m)		842.4			279.6			97.5		104.6	
Turn Bay Length (m)	25.0		25.0	40.0		25.0	100.0		40.0		50.0
Base Capacity (vph)	367	1074	629	538	1552	796	368	945	333	886	526
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	0.39	0.62	0.67	0.76	0.43	0.31	0.31	0.39	0.16	0.28	0.58

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	669	421	410	667	243	114	319	45	54	246	303
Future Volume (vph)	143	669	421	410	667	243	114	319	45	54	246	303
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
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)	1641	3406	1538	1736	3343	1538	1595	3309		1610	3374	1151
Flt Permitted	0.40	1.00	1.00	0.22	1.00	1.00	0.56	1.00		0.49	1.00	1.00
Satd. Flow (perm)	688	3406	1538	404	3343	1538	943	3309		837	3374	1151
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	669	421	410	667	243	114	319	45	54	246	303
RTOR Reduction (vph)	0	0	146	0	0	89	0	9	0	0	0	222
Lane Group Flow (vph)	143	669	275	410	667	154	114	355	0	54	246	81
Confl. Peds. (#/hr)							3		2	2		3
Heavy Vehicles (%)	10%	6%	5%	4%	8%	5%	13%	7%	6%	12%	7%	38%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	44.6	35.3	35.3	61.3	48.0	48.0	39.4	32.4		36.4	30.9	30.9
Effective Green, g (s)	44.6	35.3	35.3	61.3	48.0	48.0	39.4	32.4		36.4	30.9	30.9
Actuated g/C Ratio	0.39	0.31	0.31	0.53	0.42	0.42	0.34	0.28		0.32	0.27	0.27
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	6.0
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)	343	1043	471	469	1392	640	362	930		301	905	308
v/s Ratio Prot	0.03	0.20		c0.17	0.20		c0.02	c0.11		0.01	0.07	
v/s Ratio Perm	0.13		0.18	c0.30		0.10	0.09			0.05		0.07
v/c Ratio	0.42	0.64	0.58	0.87	0.48	0.24	0.31	0.38		0.18	0.27	0.26
Uniform Delay, d1	23.7	34.5	33.7	19.9	24.5	21.8	26.9	33.3		27.9	33.3	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
Incremental Delay, d2	0.8	1.4	1.8	16.4	0.3	0.2	0.5	1.2		0.3	0.7	2.1
Delay (s)	24.5	35.8	35.6	36.3	24.8	22.0	27.4	34.5		28.2	34.0	35.3
Level of Service	C	D	D	D	C	C	C	C		C	C	D
Approach Delay (s)		34.4			27.8			32.8			34.1	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	115.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	94.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	44	1371	392	1349	98	54	31	181
v/c Ratio	0.16	0.66	0.79	0.44	0.44	0.13	0.13	0.44
Control Delay	9.9	27.9	56.0	6.7	43.0	22.1	36.0	20.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.9	27.9	56.0	6.7	43.0	22.1	36.0	20.4
Queue Length 50th (m)	2.6	89.0	76.8	16.7	18.6	1.8	5.7	6.3
Queue Length 95th (m)	5.9	117.0	110.3	37.1	33.9	8.2	13.9	17.5
Internal Link Dist (m)		279.4		63.9		107.8		187.7
Turn Bay Length (m)	60.0		25.0		45.0		50.0	
Base Capacity (vph)	283	2069	506	3075	225	753	240	876
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	0.16	0.66	0.77	0.44	0.44	0.07	0.13	0.21

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	1239	132	392	1263	86	98	17	37	31	57	124
Future Volume (vph)	44	1239	132	392	1263	86	98	17	37	31	57	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.90		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	4874		1752	4850		1656	2958		1570	3189	
Flt Permitted	0.19	1.00		0.10	1.00		0.51	1.00		0.72	1.00	
Satd. Flow (perm)	362	4874		180	4850		886	2958		1189	3189	
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)	44	1239	132	392	1263	86	98	17	37	31	57	124
RTOR Reduction (vph)	0	10	0	0	5	0	0	32	0	0	111	0
Lane Group Flow (vph)	44	1361	0	392	1344	0	98	22	0	31	70	0
Confl. Peds. (#/hr)			5	5								
Heavy Vehicles (%)	0%	5%	2%	3%	6%	5%	9%	4%	12%	15%	5%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	49.0	44.8		74.7	66.5		22.3	14.8		16.3	11.8	
Effective Green, g (s)	49.0	44.8		74.7	66.5		22.3	14.8		16.3	11.8	
Actuated g/C Ratio	0.45	0.41		0.68	0.60		0.20	0.13		0.15	0.11	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	216	1985		492	2932		232	397		191	342	
v/s Ratio Prot	0.01	0.28		c0.19	0.28		c0.03	0.01		0.01	0.02	
v/s Ratio Perm	0.08			c0.35			c0.06			0.02		
v/c Ratio	0.20	0.69		0.80	0.46		0.42	0.06		0.16	0.21	
Uniform Delay, d1	17.3	26.8		27.4	11.9		37.2	41.5		40.7	44.8	
Progression Factor	1.00	1.00		1.96	0.58		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	2.0		6.4	0.4		1.2	0.1		0.4	0.3	
Delay (s)	17.8	28.8		60.0	7.3		38.4	41.6		41.1	45.1	
Level of Service	B	C		E	A		D	D		D	D	
Approach Delay (s)		28.4			19.2			39.6			44.5	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	25.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	79.5%	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)	12	739	16	108	535	171	20	115	114	168	288	97
v/c Ratio	0.03	0.39	0.02	0.34	0.28	0.18	0.05	0.09	0.18	0.37	0.23	0.15
Control Delay	13.2	16.7	2.6	19.1	15.3	2.5	25.9	25.8	5.4	31.5	27.5	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.2	16.7	2.6	19.1	15.3	2.5	25.9	25.8	5.4	31.5	27.5	5.7
Queue Length 50th (m)	1.3	53.5	0.0	14.4	36.0	0.0	3.2	9.8	0.0	30.6	26.0	0.0
Queue Length 95th (m)	4.5	67.7	2.2	28.6	47.3	10.3	9.0	16.7	12.4	50.9	37.1	11.6
Internal Link Dist (m)		263.0			842.4			272.7			130.1	
Turn Bay Length (m)	60.0		60.0	60.0		60.0	60.0		60.0	60.0		60.0
Base Capacity (vph)	427	1916	869	321	1916	935	374	1268	640	453	1268	629
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	0.03	0.39	0.02	0.34	0.28	0.18	0.05	0.09	0.18	0.37	0.23	0.15

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	739	16	108	535	171	20	115	114	168	288	97
Future Volume (vph)	12	739	16	108	535	171	20	115	114	168	288	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	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)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.42	1.00	1.00	0.32	1.00	1.00	0.56	1.00	1.00	0.68	1.00	1.00
Satd. Flow (perm)	789	3539	1583	594	3539	1583	1045	3539	1583	1265	3539	1583
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)	12	739	16	108	535	171	20	115	114	168	288	97
RTOR Reduction (vph)	0	0	7	0	0	78	0	0	73	0	0	62
Lane Group Flow (vph)	12	739	9	108	535	93	20	115	41	168	288	35
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	65.0	65.0	65.0	65.0	65.0	65.0	43.0	43.0	43.0	43.0	43.0	43.0
Effective Green, g (s)	65.0	65.0	65.0	65.0	65.0	65.0	43.0	43.0	43.0	43.0	43.0	43.0
Actuated g/C Ratio	0.54	0.54	0.54	0.54	0.54	0.54	0.36	0.36	0.36	0.36	0.36	0.36
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Grp Cap (vph)	427	1916	857	321	1916	857	374	1268	567	453	1268	567
v/s Ratio Prot		c0.21			0.15			0.03			0.08	
v/s Ratio Perm	0.02		0.01	0.18		0.06	0.02		0.03	c0.13		0.02
v/c Ratio	0.03	0.39	0.01	0.34	0.28	0.11	0.05	0.09	0.07	0.37	0.23	0.06
Uniform Delay, d1	12.8	15.9	12.7	15.4	14.9	13.4	25.2	25.5	25.4	28.5	26.9	25.3
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	0.1	0.6	0.0	2.8	0.4	0.3	0.3	0.1	0.2	2.3	0.4	0.2
Delay (s)	12.9	16.5	12.7	18.2	15.2	13.6	25.5	25.7	25.6	30.8	27.3	25.5
Level of Service	B	B	B	B	B	B	C	C	C	C	C	C
Approach Delay (s)		16.4			15.3			25.6			28.1	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	19.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	B38	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	T	TR	T	L	L	T	T	TR	L
Maximum Queue (m)	21.2	72.4	81.5	60.0	48.1	7.1	61.4	62.9	64.0	86.2	91.7	8.8
Average Queue (m)	7.0	22.9	30.0	18.7	17.0	0.2	35.4	42.2	30.9	39.8	51.8	1.6
95th Queue (m)	16.9	52.8	60.3	44.8	38.6	2.7	55.1	59.6	55.8	73.1	85.2	7.0
Link Distance (m)		86.5	86.5	86.5	86.5	66.0			114.0	114.0	114.0	
Upstream Blk Time (%)		0	0	0								
Queuing Penalty (veh)		0	0	0								
Storage Bay Dist (m)	70.0						65.0	65.0				20.0
Storage Blk Time (%)		0					0	0	0			
Queuing Penalty (veh)		0					0	2	0			

Intersection: 3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

Movement	NB	NB	SB	SB	SB
Directions Served	T	R	L	T	TR
Maximum Queue (m)	9.8	52.6	47.4	119.9	84.2
Average Queue (m)	1.4	21.7	43.0	50.2	11.8
95th Queue (m)	6.5	40.2	53.8	119.1	49.0
Link Distance (m)	85.8	85.8		180.4	180.4
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)			40.0		
Storage Blk Time (%)			38	1	
Queuing Penalty (veh)			5	3	

Intersection: 6: Mapleview Drive W & Highway 400 SB Off-Ramp

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	T	R	L	T	T	T	L	L	R
Maximum Queue (m)	122.2	122.8	114.6	99.2	62.6	113.8	70.6	63.8	74.4	257.2	280.8	227.3
Average Queue (m)	73.2	82.0	65.4	49.2	14.8	60.4	36.7	30.8	41.0	174.2	192.4	91.0
95th Queue (m)	132.1	129.9	112.8	85.4	48.0	98.4	61.3	51.7	65.7	295.5	315.4	225.8
Link Distance (m)	114.0	114.0	114.0	114.0			168.4	168.4	168.4		326.9	326.9
Upstream Blk Time (%)	2	2	0	0							6	1
Queuing Penalty (veh)	7	10	1	1							0	0
Storage Bay Dist (m)					45.0	135.0				300.0		
Storage Blk Time (%)				10		0				1	7	1
Queuing Penalty (veh)				20		1				5	25	5

Intersection: 6: Mapleview Drive W & Highway 400 SB Off-Ramp

Movement	SB	B36	B36
Directions Served	R	T	T
Maximum Queue (m)	196.1	36.3	38.6
Average Queue (m)	65.6	6.4	5.2
95th Queue (m)	167.2	53.1	51.3
Link Distance (m)		176.9	176.9
Upstream Blk Time (%)		1	1
Queuing Penalty (veh)		0	0
Storage Bay Dist (m)	300.0		
Storage Blk Time (%)	0		
Queuing Penalty (veh)	0		

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (m)	57.0	55.7	121.7	107.2	86.6	99.3	57.6	62.8	104.4	89.3	80.9	51.2
Average Queue (m)	26.2	28.2	26.4	20.6	22.4	52.8	28.1	30.2	56.3	46.0	42.7	25.0
95th Queue (m)	47.2	48.4	82.7	66.4	64.8	93.6	52.4	50.2	91.6	75.0	71.2	43.8
Link Distance (m)		168.4	168.4	168.4	168.4	218.3	218.3	218.3			335.8	335.8
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	130.0								130.0	265.0		
Storage Blk Time (%)									0			
Queuing Penalty (veh)									1			

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	NB
Directions Served	R
Maximum Queue (m)	44.6
Average Queue (m)	10.6
95th Queue (m)	27.8
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	265.0
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	L
Maximum Queue (m)	61.8	65.5	56.8	38.6	61.0	11.2	20.4	120.9	129.1	136.2	94.1	36.1
Average Queue (m)	35.3	39.9	25.3	21.0	31.6	1.4	2.8	44.2	51.7	77.0	11.3	12.5
95th Queue (m)	55.2	57.4	46.0	33.4	51.1	6.8	12.5	85.7	101.8	130.8	58.9	28.3
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)								0	0	1	0	
Queuing Penalty (veh)								1	1	5	1	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)								6				
Queuing Penalty (veh)								1				

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R
Maximum Queue (m)	50.1	20.6	18.6	10.4	48.0
Average Queue (m)	25.2	6.8	5.8	2.5	23.0
95th Queue (m)	44.0	16.7	14.6	8.0	43.9
Link Distance (m)	128.7	128.7		96.0	96.0
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)			60.0		
Storage Blk Time (%)	0				
Queuing Penalty (veh)	0				

Intersection: 15: Bayview Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	T	R	L	T	T	TR	L	L
Maximum Queue (m)	72.8	77.2	51.9	43.3	47.0	58.5	100.9	252.0	257.1	261.6	41.0	49.3
Average Queue (m)	43.5	44.2	15.3	21.7	24.1	24.5	16.9	219.5	248.0	251.9	11.1	22.5
95th Queue (m)	65.2	65.9	40.2	36.3	38.7	46.7	68.2	292.9	263.7	258.4	31.2	44.8
Link Distance (m)			131.2	131.2	131.2			244.4	244.4	244.4		
Upstream Blk Time (%)								8	44	89		
Queuing Penalty (veh)								0	0	0		
Storage Bay Dist (m)	70.0	70.0				50.0	120.0				95.0	95.0
Storage Blk Time (%)	0	1			0	1		11				
Queuing Penalty (veh)	1	3			0	3		7				

Intersection: 15: Bayview Drive & Mapleview Drive W

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	TR	L	T	T	R
Maximum Queue (m)	20.2	17.1	117.5	219.7	193.6	80.0
Average Queue (m)	5.1	5.5	111.6	165.8	59.7	41.2
95th Queue (m)	14.8	11.7	137.3	294.3	161.9	89.7
Link Distance (m)	218.2	218.2		214.5	214.5	
Upstream Blk Time (%)				28	0	
Queuing Penalty (veh)				146	0	
Storage Bay Dist (m)			110.0			45.0
Storage Blk Time (%)			67	4	1	12
Queuing Penalty (veh)			62	13	7	11

Intersection: 18: Bayview Drive & South Village Way/Barrie Molson Centre D/W

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	25.6	22.6	25.3	8.9	31.3	57.6	51.8	37.7	175.0	181.1
Average Queue (m)	9.8	8.0	5.5	0.9	11.6	14.5	15.8	5.3	89.2	88.9
95th Queue (m)	21.8	18.4	18.2	5.2	25.9	43.8	41.7	30.8	203.6	198.8
Link Distance (m)	126.0	126.0	60.2	60.2		214.5	214.5		195.2	195.2
Upstream Blk Time (%)									9	5
Queuing Penalty (veh)									46	27
Storage Bay Dist (m)					70.0			50.0		
Storage Blk Time (%)						0			39	
Queuing Penalty (veh)						0			3	

Intersection: 21: Bayview Drive & North Village Way/Private D/W

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	L	T	TR	L	T	TR
Maximum Queue (m)	25.8	26.4	11.4	20.7	44.4	42.6	35.6	142.2	155.8
Average Queue (m)	8.3	7.8	1.9	6.7	8.7	9.0	2.3	49.8	54.2
95th Queue (m)	19.5	21.4	7.9	15.2	28.8	28.1	20.4	151.9	157.5
Link Distance (m)		71.5	75.9		195.2	195.2		247.7	247.7
Upstream Blk Time (%)								1	2
Queuing Penalty (veh)								6	8
Storage Bay Dist (m)	25.0			70.0			70.0		
Storage Blk Time (%)	0							11	
Queuing Penalty (veh)	0							1	

Intersection: 24: Bayview Drive & Concert Way/Churchill Drive

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	21.6	12.7	27.1	51.5	33.7	49.4	41.2	43.3	123.7	115.4
Average Queue (m)	6.9	4.5	8.9	22.9	9.5	12.9	11.3	10.6	36.4	42.2
95th Queue (m)	16.8	11.9	20.6	39.4	25.6	36.1	31.6	29.3	88.8	92.0
Link Distance (m)				212.1		247.7	247.7		206.5	206.5
Upstream Blk Time (%)									0	0
Queuing Penalty (veh)									0	0
Storage Bay Dist (m)	50.0	50.0	30.0		70.0			65.0		
Storage Blk Time (%)			0	2				0	3	
Queuing Penalty (veh)			0	1				0	2	

Intersection: 28: Bayview Drive & Industrial Site D/W South/Coca-Cola D/W

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	L	L
Maximum Queue (m)	10.3	25.6	6.6	9.1
Average Queue (m)	2.3	7.3	1.5	1.0
95th Queue (m)	8.8	20.3	6.7	5.5
Link Distance (m)	177.2	182.1		
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)			15.0	15.0
Storage Blk Time (%)				0
Queuing Penalty (veh)				1

Intersection: 29: Bayview Drive & Medical Centre South D/W - Industrial Site D/W North

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (m)	22.1	11.6	22.0	47.0	5.8	3.4	8.6
Average Queue (m)	7.6	5.5	11.3	2.6	0.2	0.1	1.2
95th Queue (m)	18.3	12.7	19.5	19.7	4.1	2.4	5.6
Link Distance (m)	102.1	102.1		206.3	206.3	137.8	137.8
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			15.0				
Storage Blk Time (%)			4				
Queuing Penalty (veh)			11				

Intersection: 31: Bayview Drive & Medical Centre North D/W

Movement	EB	NB	NB
Directions Served	LR	L	T
Maximum Queue (m)	10.4	15.3	17.8
Average Queue (m)	3.4	4.0	0.9
95th Queue (m)	10.5	12.2	10.5
Link Distance (m)	108.5		137.8
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)		15.0	
Storage Blk Time (%)		0	0
Queuing Penalty (veh)		0	0

Intersection: 33: Bayview Drive & Big Bay Point Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	TR	L
Maximum Queue (m)	72.0	119.3	133.2	75.0	94.7	129.2	101.5	57.1	57.8	92.8	79.4	33.7
Average Queue (m)	30.4	62.0	63.1	49.8	64.4	57.1	47.9	16.8	22.2	45.9	25.9	12.2
95th Queue (m)	63.6	98.2	103.6	84.6	98.3	102.3	81.0	37.1	44.6	76.8	62.9	25.0
Link Distance (m)		833.7	833.7			287.9	287.9			92.4	92.4	
Upstream Blk Time (%)									0	1	0	
Queuing Penalty (veh)									0	2	0	
Storage Bay Dist (m)	25.0			25.0	40.0			25.0	100.0			40.0
Storage Blk Time (%)	12	40	41	23	33	13	24	1	0	1		0
Queuing Penalty (veh)	40	57	173	77	109	52	59	3	0	1		0

Intersection: 33: Bayview Drive & Big Bay Point Road

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (m)	63.3	87.5	69.0
Average Queue (m)	29.1	25.1	40.2
95th Queue (m)	51.2	59.9	66.8
Link Distance (m)	101.3	101.3	
Upstream Blk Time (%)		1	
Queuing Penalty (veh)		0	
Storage Bay Dist (m)			50.0
Storage Blk Time (%)	4	0	6
Queuing Penalty (veh)	2	0	7

Intersection: 39: Bryne Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	B38	B38	B38	NB
Directions Served	L	T	T	TR	L	T	T	TR	T	T	T	L
Maximum Queue (m)	58.0	91.7	102.7	100.5	32.3	88.4	67.1	70.9	26.0	6.3	14.2	48.5
Average Queue (m)	11.5	51.9	63.2	59.8	31.7	62.9	40.2	33.6	2.7	0.4	0.5	21.5
95th Queue (m)	36.1	83.4	93.0	94.5	34.2	97.1	70.1	56.9	14.1	5.7	9.1	40.3
Link Distance (m)		286.7	286.7	286.7		66.0	66.0	66.0	86.5	86.5	86.5	
Upstream Blk Time (%)						14	0	1				
Queuing Penalty (veh)						80	3	4				
Storage Bay Dist (m)	60.0				25.0							45.0
Storage Blk Time (%)		4			48	2						1
Queuing Penalty (veh)		2			202	9						0

Intersection: 39: Bryne Drive & Mapleview Drive W

Movement	NB	NB	SB	SB	SB
Directions Served	T	TR	L	T	TR
Maximum Queue (m)	21.0	21.3	27.3	34.2	35.4
Average Queue (m)	4.0	5.3	8.6	14.4	15.4
95th Queue (m)	13.2	14.6	21.7	27.1	26.5
Link Distance (m)	103.6	103.6		194.0	194.0
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)			50.0		
Storage Blk Time (%)				0	
Queuing Penalty (veh)				0	

Intersection: 43: Byrne Road/Bryne Road & Harvie Road/Big Bay Point Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	R
Maximum Queue (m)	12.9	70.1	71.3	10.6	47.7	52.6	60.3	26.5	15.6	34.4	17.3	25.5
Average Queue (m)	2.5	42.9	39.3	1.8	20.9	26.5	31.0	12.2	4.8	14.9	3.5	8.9
95th Queue (m)	9.6	64.3	61.5	7.8	40.3	50.5	54.4	23.2	13.1	28.9	11.5	18.1
Link Distance (m)		270.7	270.7			833.7	833.7			277.4	277.4	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	60.0			60.0	60.0			60.0	60.0			60.0
Storage Blk Time (%)		1	1		0	0	0					
Queuing Penalty (veh)		0	0		0	0	1					

Intersection: 43: Byrne Road/Bryne Road & Harvie Road/Big Bay Point Road

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (m)	55.8	49.1	45.1	25.6
Average Queue (m)	31.5	31.6	17.6	8.1
95th Queue (m)	51.7	47.3	34.8	18.7
Link Distance (m)		134.8	134.8	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)	60.0			60.0
Storage Blk Time (%)	0		0	
Queuing Penalty (veh)	0		0	

Network Summary

Network wide Queuing Penalty: 1334

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	314	1856	1695	761	464	239
v/c Ratio	0.70	0.53	0.66	0.52	0.74	0.43
Control Delay	38.9	8.7	10.0	3.6	49.0	29.1
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0
Total Delay	38.9	9.0	10.0	3.6	49.0	29.1
Queue Length 50th (m)	23.6	112.8	29.7	6.3	51.4	19.0
Queue Length 95th (m)	m36.8	129.5	44.7	m68.7	65.0	30.5
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	483	3514	2556	1468	825	703
Starvation Cap Reductn	0	940	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	0.72	0.66	0.52	0.56	0.34

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)	314	1856	0	0	1695	761	464	0	239	0	0	0
Future Volume (vph)	314	1856	0	0	1695	761	464	0	239	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0			6.0	4.0	6.0		6.0			
Lane Util. Factor	0.97	0.91			0.91	1.00	0.97		0.88			
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)	3213	5036			4893	1468	3242		2561			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3213	5036			4893	1468	3242		2561			
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	1856	0	0	1695	761	464	0	239	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	56	0	0	0
Lane Group Flow (vph)	314	1856	0	0	1695	761	464	0	183	0	0	0
Heavy Vehicles (%)	9%	3%	0%	0%	6%	10%	8%	0%	11%	0%	0%	0%
Turn Type	Prot	NA			NA	Free	Prot		Perm			
Protected Phases	5	2			6		8					
Permitted Phases						Free			8			
Actuated Green, G (s)	15.3	76.8			57.5	110.0	21.2		21.2			
Effective Green, g (s)	15.3	76.8			57.5	110.0	21.2		21.2			
Actuated g/C Ratio	0.14	0.70			0.52	1.00	0.19		0.19			
Clearance Time (s)	4.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)	446	3516			2557	1468	624		493			
v/s Ratio Prot	c0.10	0.37			c0.35		c0.14					
v/s Ratio Perm						0.52			0.07			
v/c Ratio	0.70	0.53			0.66	0.52	0.74		0.37			
Uniform Delay, d1	45.2	7.9			19.2	0.0	41.8		38.6			
Progression Factor	0.72	0.97			0.45	1.00	1.00		1.00			
Incremental Delay, d2	3.5	0.4			0.8	0.8	4.8		0.5			
Delay (s)	36.2	8.1			9.4	0.8	46.6		39.1			
Level of Service	D	A			A	A	D		D			
Approach Delay (s)		12.2			6.7			44.1			0.0	
Approach LOS		B			A			D			A	

Intersection Summary

HCM 2000 Control Delay	13.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	78.3%	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	SBR
Lane Group Flow (vph)	321	1564	30	13	2100	90	180	40	27	10	178
v/c Ratio	0.51	0.46	0.03	0.05	0.89	0.11	0.50	0.20	0.22	0.08	0.33
Control Delay	66.8	2.0	0.0	3.5	15.5	0.1	51.2	23.7	52.1	48.5	8.7
Queue Delay	0.0	0.0	0.0	0.0	13.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.8	2.0	0.0	3.5	28.7	0.1	51.2	23.7	52.1	48.5	8.7
Queue Length 50th (m)	40.0	11.7	0.0	0.4	42.5	0.0	20.2	2.5	5.9	2.2	4.2
Queue Length 95th (m)	55.2	20.5	m0.0	m0.5	m#188.1	m0.0	30.7	12.9	14.9	7.7	20.7
Internal Link Dist (m)		225.6			141.6			127.2		94.6	
Turn Bay Length (m)	160.0		175.0	50.0			50.0		60.0		
Base Capacity (vph)	628	3372	1057	267	2358	783	835	427	125	132	533
Starvation Cap Reductn	0	0	0	0	290	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	0.51	0.46	0.03	0.05	1.02	0.11	0.22	0.09	0.22	0.08	0.33

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)	321	1564	30	13	2100	90	180	12	28	27	10	178
Future Volume (vph)	321	1564	30	13	2100	90	180	12	28	27	10	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90		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)	3367	4893	1476	1805	4848	1475	3467	1685		1805	1900	1599
Flt Permitted	0.95	1.00	1.00	0.15	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3367	4893	1476	288	4848	1475	3467	1685		1805	1900	1599
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)	321	1564	30	13	2100	90	180	12	28	27	10	178
RTOR Reduction (vph)	0	0	11	0	0	48	0	25	0	0	0	117
Lane Group Flow (vph)	321	1564	19	13	2100	42	180	15	0	27	10	61
Confl. Peds. (#/hr)	2		1	1		2			1	1		
Heavy Vehicles (%)	4%	6%	8%	0%	7%	8%	1%	0%	0%	0%	0%	1%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases			2	6		6						4
Actuated Green, G (s)	20.5	70.2	70.2	52.5	51.1	51.1	11.5	11.5		4.9	4.9	25.4
Effective Green, g (s)	20.5	70.2	70.2	52.5	51.1	51.1	11.5	11.5		4.9	4.9	25.4
Actuated g/C Ratio	0.19	0.64	0.64	0.48	0.46	0.46	0.10	0.10		0.04	0.04	0.23
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0
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)	627	3122	941	156	2252	685	362	176		80	84	369
v/s Ratio Prot	c0.10	0.32		0.00	c0.43		c0.05	0.01		c0.01	0.01	0.03
v/s Ratio Perm			0.01	0.04		0.03						0.01
v/c Ratio	0.51	0.50	0.02	0.08	0.93	0.06	0.50	0.08		0.34	0.12	0.17
Uniform Delay, d1	40.3	10.6	7.3	15.1	27.8	16.2	46.5	44.5		51.0	50.5	33.8
Progression Factor	1.55	0.17	1.00	0.45	0.46	0.01	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	0.5	0.0	0.1	2.7	0.0	1.1	0.2		2.5	0.6	0.2
Delay (s)	63.2	2.3	7.3	6.8	15.4	0.1	47.6	44.7		53.5	51.1	34.0
Level of Service	E	A	A	A	B	A	D	D		D	D	C
Approach Delay (s)		12.6			14.8			47.1			37.3	
Approach LOS		B			B			D			D	

Intersection Summary

HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	75.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (m)	54.3	53.9	145.4	107.4	82.2	111.6	80.4	66.3	53.2	79.8	83.6	58.2
Average Queue (m)	25.2	25.9	29.0	20.7	21.5	51.9	26.6	31.2	6.1	45.4	43.2	24.7
95th Queue (m)	46.8	46.2	94.1	71.7	61.6	94.1	55.7	55.2	29.3	70.1	69.2	46.0
Link Distance (m)		168.4	168.4	168.4	168.4	218.3	218.3	218.3			335.8	335.8
Upstream Blk Time (%)			0	0								
Queuing Penalty (veh)			0	0								
Storage Bay Dist (m)	130.0								130.0	265.0		
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	NB
Directions Served	R
Maximum Queue (m)	46.0
Average Queue (m)	9.2
95th Queue (m)	25.9
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	265.0
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	L
Maximum Queue (m)	54.3	65.5	74.0	39.4	57.5	9.1	21.5	94.1	105.2	124.0	76.3	42.4
Average Queue (m)	32.8	39.1	23.1	18.1	28.8	1.3	3.0	39.4	37.8	60.2	9.4	13.6
95th Queue (m)	51.6	57.6	50.6	33.4	46.6	6.1	12.8	77.0	77.4	102.5	50.0	31.2
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)								0	0	0	0	
Queuing Penalty (veh)								0	0	2	1	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)								5				0
Queuing Penalty (veh)								1				0

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R
Maximum Queue (m)	53.0	18.1	21.0	14.3	43.8
Average Queue (m)	25.4	5.8	6.8	2.6	20.8
95th Queue (m)	45.5	13.8	16.2	9.0	39.0
Link Distance (m)	128.7	128.7		96.0	96.0
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)			60.0		
Storage Blk Time (%)	1				
Queuing Penalty (veh)	1				

Zone Summary

Zone wide Queuing Penalty: 5

Lane Group	WBT	NET
Lane Group Flow (vph)	1725	1496
v/c Ratio	0.70	0.76
Control Delay	11.5	31.5
Queue Delay	0.2	0.0
Total Delay	11.7	31.5
Queue Length 50th (m)	35.9	98.4
Queue Length 95th (m)	47.6	110.9
Internal Link Dist (m)	43.5	23.7
Turn Bay Length (m)		
Base Capacity (vph)	2482	2134
Starvation Cap Reductn	193	0
Spillback Cap Reductn	75	4
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.75	0.70

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	1725	0	0	1496	0	0	0	0
Future Volume (vph)	0	0	0	0	1725	0	0	1496	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0			6.0				
Lane Util. Factor					0.91			0.91				
Frt					1.00			1.00				
Flt Protected					1.00			1.00				
Satd. Flow (prot)					4995			4995				
Flt Permitted					1.00			1.00				
Satd. Flow (perm)					4995			4995				
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	0	1725	0	0	1496	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1725	0	0	1496	0	0	0	0
Heavy Vehicles (%)	0%	0%	0%	0%	5%	0%	0%	5%	0%	0%	0%	0%
Turn Type					NA			NA				
Protected Phases					6			8				
Permitted Phases												
Actuated Green, G (s)					54.7			43.3				
Effective Green, g (s)					54.7			43.3				
Actuated g/C Ratio					0.50			0.39				
Clearance Time (s)					6.0			6.0				
Vehicle Extension (s)					3.0			3.0				
Lane Grp Cap (vph)					2483			1966				
v/s Ratio Prot					c0.35			c0.30				
v/s Ratio Perm												
v/c Ratio					0.69			0.76				
Uniform Delay, d1					21.2			28.9				
Progression Factor					0.47			1.00				
Incremental Delay, d2					1.2			1.8				
Delay (s)					11.1			30.7				
Level of Service					B			C				
Approach Delay (s)		0.0			11.1			30.7			0.0	
Approach LOS		A			B			C			A	

Intersection Summary

HCM 2000 Control Delay	20.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	SBL
Lane Group Flow (vph)	1496	675
v/c Ratio	0.69	0.43
Control Delay	1.4	20.8
Queue Delay	0.2	0.0
Total Delay	1.5	20.8
Queue Length 50th (m)	0.0	48.5
Queue Length 95th (m)	0.0	63.0
Internal Link Dist (m)	41.3	34.0
Turn Bay Length (m)		
Base Capacity (vph)	2179	1578
Starvation Cap Reductn	128	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.73	0.43

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1496	0	0	675	0
Future Volume (vph)	0	1496	0	0	675	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			6.0	
Lane Util. Factor		0.91			0.97	
Frt		1.00			1.00	
Flt Protected		1.00			0.95	
Satd. Flow (prot)		4995			3404	
Flt Permitted		1.00			0.95	
Satd. Flow (perm)		4995			3404	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1496	0	0	675	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1496	0	0	675	0
Heavy Vehicles (%)	0%	5%	0%	0%	4%	0%
Turn Type		NA			Prot	
Protected Phases		4			6	
Permitted Phases						
Actuated Green, G (s)		48.0			51.0	
Effective Green, g (s)		48.0			51.0	
Actuated g/C Ratio		0.44			0.46	
Clearance Time (s)		5.0			6.0	
Vehicle Extension (s)		3.0			3.0	
Lane Grp Cap (vph)		2179			1578	
v/s Ratio Prot		c0.30			c0.20	
v/s Ratio Perm						
v/c Ratio		0.69			0.43	
Uniform Delay, d1		24.9			19.7	
Progression Factor		0.00			1.00	
Incremental Delay, d2		1.3			0.8	
Delay (s)		1.4			20.6	
Level of Service		A			C	
Approach Delay (s)		1.4	0.0		20.6	
Approach LOS		A	A		C	

Intersection Summary

HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	56.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	SWT
Lane Group Flow (vph)	1856	1695
v/c Ratio	0.83	0.76
Control Delay	19.8	28.4
Queue Delay	0.5	0.0
Total Delay	20.3	28.4
Queue Length 50th (m)	68.0	110.8
Queue Length 95th (m)	77.2	133.1
Internal Link Dist (m)	50.1	8.2
Turn Bay Length (m)		
Base Capacity (vph)	2360	2237
Starvation Cap Reductn	171	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.85	0.76

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	1856	0	0	0	0	0	0	0	0	1695	0
Future Volume (vph)	0	1856	0	0	0	0	0	0	0	0	1695	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0									6.0	
Lane Util. Factor		0.91									0.91	
Frt		1.00									1.00	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		5092									4948	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		5092									4948	
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	1856	0	0	0	0	0	0	0	0	1695	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1856	0	0	0	0	0	0	0	0	1695	0
Heavy Vehicles (%)	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	6%	0%
Turn Type		NA									NA	
Protected Phases		4									2	
Permitted Phases												
Actuated Green, G (s)		48.3									49.7	
Effective Green, g (s)		48.3									49.7	
Actuated g/C Ratio		0.44									0.45	
Clearance Time (s)		6.0									6.0	
Vehicle Extension (s)		3.0									3.0	
Lane Grp Cap (vph)		2235									2235	
v/s Ratio Prot		c0.36									c0.34	
v/s Ratio Perm												
v/c Ratio		0.83									0.76	
Uniform Delay, d1		27.2									25.1	
Progression Factor		0.62									1.00	
Incremental Delay, d2		2.3									2.5	
Delay (s)		19.0									27.6	
Level of Service		B									C	
Approach Delay (s)		19.0			0.0			0.0			27.6	
Approach LOS		B			A			A			C	

Intersection Summary

HCM 2000 Control Delay	23.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Traffic Volume (veh/h)	0	0	433	1725	0	0
Future Volume (Veh/h)	0	0	433	1725	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	433	1725	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	67			77		
pX, platoon unblocked					0.70	
vC, conflicting volume			0		1441	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		142	0
tC, single (s)			4.3		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			72		100	100
cM capacity (veh/h)			1558		427	1091

Direction, Lane #	WB 1	WB 2	WB 3
Volume Total	778	690	690
Volume Left	433	0	0
Volume Right	0	0	0
cSH	1558	1700	1700
Volume to Capacity	0.28	0.41	0.41
Queue Length 95th (m)	8.7	0.0	0.0
Control Delay (s)	5.8	0.0	0.0
Lane LOS	A		
Approach Delay (s)	2.1		
Approach LOS			

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1496	198	0	0	0	0
Future Volume (Veh/h)	1496	198	0	0	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1496	198	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				48		
pX, platoon unblocked						
vC, conflicting volume			1694		1496	499
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1694		1496	499
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			382		116	523

Direction, Lane #	EB 1	EB 2	EB 3	EB 4
Volume Total	499	499	499	198
Volume Left	0	0	0	0
Volume Right	0	0	0	198
cSH	1700	1700	1700	1700
Volume to Capacity	0.29	0.29	0.29	0.12
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0			
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	WBT	SBR
Lane Group Flow (vph)	1725	723
v/c Ratio	0.75	0.61
Control Delay	2.4	26.7
Queue Delay	0.0	0.0
Total Delay	2.4	26.7
Queue Length 50th (m)	0.1	65.8
Queue Length 95th (m)	0.2	86.8
Internal Link Dist (m)	10.7	
Turn Bay Length (m)		
Base Capacity (vph)	2315	1186
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.75	0.61

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	1725	0	0	723
Future Volume (vph)	0	0	1725	0	0	723
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			6.0			6.0
Lane Util. Factor			0.91			0.88
Frt			1.00			0.85
Flt Protected			1.00			1.00
Satd. Flow (prot)			4995			2763
Flt Permitted			1.00			1.00
Satd. Flow (perm)			4995			2763
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	1725	0	0	723
RTOR Reduction (vph)	0	0	0	0	0	6
Lane Group Flow (vph)	0	0	1725	0	0	717
Heavy Vehicles (%)	0%	0%	5%	0%	0%	4%
Turn Type			NA			Prot
Protected Phases			2			8
Permitted Phases						
Actuated Green, G (s)			51.0			47.0
Effective Green, g (s)			51.0			47.0
Actuated g/C Ratio			0.46			0.43
Clearance Time (s)			6.0			6.0
Lane Grp Cap (vph)			2315			1180
v/s Ratio Prot			c0.35			c0.26
v/s Ratio Perm						
v/c Ratio			0.75			0.61
Uniform Delay, d1			24.2			24.4
Progression Factor			0.03			1.00
Incremental Delay, d2			1.6			2.3
Delay (s)			2.4			26.7
Level of Service			A			C
Approach Delay (s)		0.0	2.4		26.7	
Approach LOS		A	A		C	

Intersection Summary

HCM 2000 Control Delay	9.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

12: E-N

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (veh/h)	0	0	1695	761	0	0
Future Volume (Veh/h)	0	0	1695	761	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	1695	761	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		32				
pX, platoon unblocked						
vC, conflicting volume	2456				1695	565
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2456				1695	565
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	193				85	473

Direction, Lane #	WB 1	WB 2	WB 3	WB 4
Volume Total	565	565	565	761
Volume Left	0	0	0	0
Volume Right	0	0	0	761
cSH	1700	1700	1700	1700
Volume to Capacity	0.33	0.33	0.33	0.45
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0			
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		

14: S-E

Lane Group	EBT	NBR
Lane Group Flow (vph)	1856	239
v/c Ratio	0.76	0.21
Control Delay	1.4	18.8
Queue Delay	0.1	0.0
Total Delay	1.5	18.8
Queue Length 50th (m)	0.0	16.8
Queue Length 95th (m)	0.0	25.8
Internal Link Dist (m)	26.5	
Turn Bay Length (m)		
Base Capacity (vph)	2430	1146
Starvation Cap Reductn	66	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.79	0.21

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1856	0	0	0	0	239
Future Volume (vph)	1856	0	0	0	0	239
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5					4.5
Lane Util. Factor	0.91					0.88
Frt	1.00					0.85
Flt Protected	1.00					1.00
Satd. Flow (prot)	5092					2589
Flt Permitted	1.00					1.00
Satd. Flow (perm)	5092					2589
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1856	0	0	0	0	239
RTOR Reduction (vph)	0	0	0	0	0	5
Lane Group Flow (vph)	1856	0	0	0	0	234
Heavy Vehicles (%)	3%	0%	0%	0%	0%	11%
Turn Type	NA					Perm
Protected Phases	4					
Permitted Phases						2
Actuated Green, G (s)	52.5					48.5
Effective Green, g (s)	52.5					48.5
Actuated g/C Ratio	0.48					0.44
Clearance Time (s)	4.5					4.5
Lane Grp Cap (vph)	2430					1141
v/s Ratio Prot	c0.36					
v/s Ratio Perm						c0.09
v/c Ratio	0.76					0.21
Uniform Delay, d1	23.6					18.9
Progression Factor	0.00					1.00
Incremental Delay, d2	1.4					0.4
Delay (s)	1.4					19.3
Level of Service	A					B
Approach Delay (s)	1.4			0.0	19.3	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	3.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Traffic Volume (veh/h)	314	1856	0	0	0	0
Future Volume (Veh/h)	314	1856	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	314	1856	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		75	74			
pX, platoon unblocked					0.76	
vC, conflicting volume	0				1247	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				243	0
tC, single (s)	4.3				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	80				100	100
cM capacity (veh/h)	1572				446	1091

Direction, Lane #	EB 1	EB 2	EB 3
Volume Total	685	742	742
Volume Left	314	0	0
Volume Right	0	0	0
cSH	1572	1700	1700
Volume to Capacity	0.20	0.44	0.44
Queue Length 95th (m)	5.7	0.0	0.0
Control Delay (s)	4.7	0.0	0.0
Lane LOS	A		
Approach Delay (s)	1.5		
Approach LOS			

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	96.0%	ICU Level of Service	F
Analysis Period (min)	15		

Lane Group	WBT	NBL
Lane Group Flow (vph)	1695	464
v/c Ratio	0.80	0.31
Control Delay	5.2	19.1
Queue Delay	0.0	0.0
Total Delay	5.2	19.1
Queue Length 50th (m)	5.2	31.1
Queue Length 95th (m)	5.7	42.4
Internal Link Dist (m)	42.1	32.8
Turn Bay Length (m)		
Base Capacity (vph)	2114	1519
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.80	0.31

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1695	464	0
Future Volume (vph)	0	0	0	1695	464	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.0	6.0	
Lane Util. Factor				0.91	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				4948	3278	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				4948	3278	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	1695	464	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	1695	464	0
Heavy Vehicles (%)	0%	0%	0%	6%	8%	0%
Turn Type				NA	Prot	
Protected Phases				8	2	
Permitted Phases						
Actuated Green, G (s)				47.0	51.0	
Effective Green, g (s)				47.0	51.0	
Actuated g/C Ratio				0.43	0.46	
Clearance Time (s)				6.0	6.0	
Vehicle Extension (s)				3.0	3.0	
Lane Grp Cap (vph)				2114	1519	
v/s Ratio Prot				c0.34	c0.14	
v/s Ratio Perm						
v/c Ratio				0.80	0.31	
Uniform Delay, d1				27.4	18.4	
Progression Factor				0.11	1.00	
Incremental Delay, d2				2.1	0.5	
Delay (s)				5.2	19.0	
Level of Service				A	B	
Approach Delay (s)	0.0			5.2	19.0	
Approach LOS	A			A	B	

Intersection Summary

HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 1: West Terminal-E-S

Movement	WB	WB	WB	NE	NE	NE
Directions Served	T	T	T	T	T	T
Maximum Queue (m)	53.0	48.4	48.0	34.5	28.5	27.1
Average Queue (m)	39.9	40.2	31.2	25.2	23.5	18.9
95th Queue (m)	53.4	50.8	48.9	30.6	26.2	29.2
Link Distance (m)	18.6	18.6	18.6	22.8	22.8	22.8
Upstream Blk Time (%)	37	47	36	52	37	12
Queuing Penalty (veh)	212	269	209	258	184	59
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: W-N & N-E

Movement	EB	EB	EB	SB	SB
Directions Served	T	T	T	L	L
Maximum Queue (m)	21.8	15.2	9.0	64.0	58.4
Average Queue (m)	9.5	2.7	0.4	51.7	37.2
95th Queue (m)	17.6	9.9	4.6	67.0	51.8
Link Distance (m)	22.8	22.8	22.8	37.0	37.0
Upstream Blk Time (%)	1	0	0	20	7
Queuing Penalty (veh)	4	0	0	68	24
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: East Terminal

Movement	EB	EB	EB	SW	SW	SW
Directions Served	T	T	T	T	T	T
Maximum Queue (m)	67.6	64.0	62.7	47.3	46.4	43.9
Average Queue (m)	58.8	56.5	50.8	37.2	37.5	30.5
95th Queue (m)	64.0	62.8	65.2	42.7	41.9	46.6
Link Distance (m)	27.3	27.3	27.3	19.8	19.8	19.8
Upstream Blk Time (%)	38	44	36	58	48	25
Queuing Penalty (veh)	237	270	223	330	270	139
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: West Terminal-E-S

Movement	WB	WB	WB
Directions Served	LT	T	T
Maximum Queue (m)	56.9	48.9	27.8
Average Queue (m)	16.7	7.9	3.7
95th Queue (m)	43.1	29.7	20.2
Link Distance (m)	59.5	59.5	59.5
Upstream Blk Time (%)	0	0	0
Queuing Penalty (veh)	1	1	0
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: W-S

Movement	EB	EB	EB
Directions Served	T	T	T
Maximum Queue (m)	185.5	158.5	108.2
Average Queue (m)	118.7	99.0	41.3
95th Queue (m)	168.0	144.4	93.6
Link Distance (m)	183.8	183.8	183.8
Upstream Blk Time (%)	0	0	
Queuing Penalty (veh)	0	0	
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: N-W

Movement	WB	WB	WB	SB	SB
Directions Served	T	T	T	R	R
Maximum Queue (m)	7.9	19.6	16.8	64.9	54.5
Average Queue (m)	1.0	4.9	5.2	54.3	38.1
95th Queue (m)	5.3	14.4	15.0	68.0	50.6
Link Distance (m)	7.7	7.7	7.7	37.2	37.2
Upstream Blk Time (%)	4	20	20	25	8
Queuing Penalty (veh)	23	114	115	91	30
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 12: E-N

Movement	WB	WB	WB	WB
Directions Served	T	T	T	R
Maximum Queue (m)	198.1	186.6	133.9	4.0
Average Queue (m)	142.9	124.1	61.2	0.1
95th Queue (m)	193.8	173.6	122.6	2.8
Link Distance (m)	187.5	187.5	187.5	187.5
Upstream Blk Time (%)	2	0		
Queuing Penalty (veh)	0	0		
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 14: S-E

Movement	EB	EB	NB	NB
Directions Served	T	T	R	R
Maximum Queue (m)	8.6	14.0	56.8	47.0
Average Queue (m)	0.9	1.8	25.6	13.0
95th Queue (m)	4.9	8.3	47.6	36.7
Link Distance (m)	20.9	20.9	48.7	48.7
Upstream Blk Time (%)		0	1	0
Queuing Penalty (veh)		0	1	0
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 16: W-N/East Terminal

Movement	EB	EB	EB
Directions Served	LT	T	T
Maximum Queue (m)	63.4	52.4	35.8
Average Queue (m)	31.7	22.9	8.8
95th Queue (m)	55.1	49.6	26.3
Link Distance (m)	54.6	54.6	54.6
Upstream Blk Time (%)	1	0	0
Queuing Penalty (veh)	5	1	0
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 17: S-W

Movement	WB	WB	WB	NB	NB
Directions Served	T	T	T	L	L
Maximum Queue (m)	38.2	39.7	30.7	62.7	44.1
Average Queue (m)	26.5	23.3	15.1	44.1	28.2
95th Queue (m)	36.8	35.3	31.3	63.6	49.3
Link Distance (m)	31.8	31.8	31.8	39.6	39.6
Upstream Blk Time (%)	6	2	0	11	1
Queuing Penalty (veh)	33	12	1	25	2
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 3213

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	51	1614	395	1815	60	95	442	318	42
v/c Ratio	0.33	0.60	0.78	0.68	0.19	0.33	0.91	0.73	0.05
Control Delay	21.9	20.5	74.9	11.0	30.2	49.3	40.3	46.0	18.8
Queue Delay	0.0	0.7	0.0	0.2	0.0	0.0	0.7	0.0	0.0
Total Delay	21.9	21.2	74.9	11.1	30.2	49.3	41.0	46.0	18.8
Queue Length 50th (m)	3.8	60.3	44.4	116.2	11.3	23.0	42.7	70.2	2.1
Queue Length 95th (m)	15.5	58.8	64.1	178.6	19.2	36.4	80.7	88.1	6.4
Internal Link Dist (m)		85.2		118.2		85.0			175.8
Turn Bay Length (m)	70.0		65.0		20.0			40.0	
Base Capacity (vph)	158	2689	547	2665	310	453	597	434	1071
Starvation Cap Reductn	0	0	0	177	0	0	0	0	0
Spillback Cap Reductn	0	660	0	0	0	0	30	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.80	0.72	0.73	0.19	0.21	0.78	0.73	0.04

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	1570	44	395	1555	260	60	95	442	318	19	23
Future Volume (vph)	51	1570	44	395	1555	260	60	95	442	318	19	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0	6.0	4.0	6.0	
Lane Util. Factor	1.00	0.86		0.97	0.91		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.99	1.00	
Frt	1.00	1.00		1.00	0.98		1.00	1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	6319		3502	4950		1805	1900	1575	1777	3313	
Flt Permitted	0.08	1.00		0.95	1.00		0.73	1.00	1.00	0.58	1.00	
Satd. Flow (perm)	152	6319		3502	4950		1384	1900	1575	1086	3313	
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)	51	1570	44	395	1555	260	60	95	442	318	19	23
RTOR Reduction (vph)	0	2	0	0	15	0	0	0	246	0	17	0
Lane Group Flow (vph)	51	1612	0	395	1800	0	60	95	196	318	25	0
Confl. Peds. (#/hr)	7		1	1		7			6	6		
Heavy Vehicles (%)	0%	3%	2%	0%	2%	3%	0%	0%	0%	1%	0%	0%
Turn Type	pm+pt	NA		Prot	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2						8		8	4		
Actuated Green, G (s)	59.8	54.4		18.9	67.9		25.2	20.7	20.7	40.7	32.2	
Effective Green, g (s)	59.8	54.4		18.9	67.9		25.2	20.7	20.7	40.7	32.2	
Actuated g/C Ratio	0.46	0.42		0.15	0.52		0.19	0.16	0.16	0.31	0.25	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0	6.0	4.0	6.0	
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)	138	2644		509	2585		282	302	250	425	820	
v/s Ratio Prot	0.02	0.26		c0.11	c0.36		0.01	0.05		c0.09	0.01	
v/s Ratio Perm	0.15						0.03		0.12	c0.14		
v/c Ratio	0.37	0.61		0.78	0.70		0.21	0.31	0.79	0.75	0.03	
Uniform Delay, d1	20.9	29.5		53.5	23.3		43.7	48.4	52.5	38.2	37.1	
Progression Factor	1.14	0.64		1.22	0.41		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.5	0.9		6.3	1.3		0.4	0.6	14.9	7.1	0.0	
Delay (s)	25.4	19.8		71.5	10.8		44.1	49.0	67.4	45.3	37.1	
Level of Service	C	B		E	B		D	D	E	D	D	
Approach Delay (s)		20.0			21.7			62.2			44.3	
Approach LOS		B			C			E			D	

Intersection Summary

HCM 2000 Control Delay	27.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	2139	189	468	1933	677	278
v/c Ratio	0.87	0.29	0.94	0.56	0.84	0.40
Control Delay	28.5	6.0	42.2	10.6	57.1	33.5
Queue Delay	0.3	0.0	0.0	0.7	2.3	0.0
Total Delay	28.8	6.0	42.2	11.3	59.4	33.5
Queue Length 50th (m)	167.9	4.9	95.1	145.4	89.2	27.8
Queue Length 95th (m)	#132.7	m10.9	m#163.6	174.8	109.0	41.3
Internal Link Dist (m)	118.2			168.8		
Turn Bay Length (m)		45.0	135.0		300.0	300.0
Base Capacity (vph)	2463	650	511	3432	906	778
Starvation Cap Reductn	60	0	0	1043	0	0
Spillback Cap Reductn	34	0	0	331	120	3
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.29	0.92	0.81	0.86	0.36

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)	0	2139	189	468	1933	0	0	0	0	677	0	278
Future Volume (vph)	0	2139	189	468	1933	0	0	0	0	677	0	278
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	4.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	1.00	0.91					0.97		0.88
Frpb, ped/bikes		1.00	1.00	1.00	1.00					1.00		1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		6408	1553	1736	5136					3367		2733
Flt Permitted		1.00	1.00	0.07	1.00					0.95		1.00
Satd. Flow (perm)		6408	1553	135	5136					3367		2733
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	2139	189	468	1933	0	0	0	0	677	0	278
RTOR Reduction (vph)	0	0	53	0	0	0	0	0	0	0	0	45
Lane Group Flow (vph)	0	2139	136	468	1933	0	0	0	0	677	0	233
Confl. Peds. (#/hr)	4					4						
Heavy Vehicles (%)	0%	2%	4%	4%	1%	0%	0%	0%	0%	4%	0%	4%
Turn Type		NA	Perm	pm+pt	NA					Prot		Perm
Protected Phases		2		1	6					4		
Permitted Phases			2	6								4
Actuated Green, G (s)		50.0	50.0	86.9	86.9					31.1		31.1
Effective Green, g (s)		50.0	50.0	86.9	86.9					31.1		31.1
Actuated g/C Ratio		0.38	0.38	0.67	0.67					0.24		0.24
Clearance Time (s)		6.0	6.0	4.0	6.0					6.0		6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		3.0
Lane Grp Cap (vph)		2464	597	495	3433					805		653
v/s Ratio Prot		0.33		c0.24	0.38					c0.20		
v/s Ratio Perm			0.09	c0.39								0.09
v/c Ratio		0.87	0.23	0.95	0.56					0.84		0.36
Uniform Delay, d1		37.0	27.0	39.7	11.5					47.1		41.1
Progression Factor		0.65	0.32	0.56	0.85					1.00		1.00
Incremental Delay, d2		3.5	0.7	19.1	0.4					7.9		0.3
Delay (s)		27.4	9.4	41.3	10.1					55.0		41.5
Level of Service		C	A	D	B					E		D
Approach Delay (s)		25.9			16.2			0.0			51.1	
Approach LOS		C			B			A			D	

Intersection Summary

HCM 2000 Control Delay	26.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	112.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	683	2133	1906	1061	495	573
v/c Ratio	0.97	0.61	0.81	1.02	0.69	0.93
Control Delay	52.9	15.7	21.1	31.6	53.0	67.4
Queue Delay	0.0	5.2	0.2	23.6	0.0	0.0
Total Delay	52.9	20.8	21.3	55.3	53.0	67.4
Queue Length 50th (m)	84.0	176.8	76.1	~107.4	63.6	78.2
Queue Length 95th (m)	m#126.8	196.0	m69.6	m48.9	83.0	#115.1
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	707	3517	2346	1037	739	634
Starvation Cap Reductn	0	1314	0	61	0	0
Spillback Cap Reductn	0	0	59	0	4	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.97	0.97	0.83	1.09	0.67	0.90

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)	683	2133	0	0	1906	1061	495	0	573	0	0	0
Future Volume (vph)	683	2133	0	0	1906	1061	495	0	573	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0			6.0	6.0	6.0		6.0			
Lane Util. Factor	0.97	0.91			0.91	1.00	0.97		0.88			
Frpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00			
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)	3433	5036			5085	1583	3433		2733			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3433	5036			5085	1583	3433		2733			
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)	683	2133	0	0	1906	1061	495	0	573	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	307	0	0	47	0	0	0
Lane Group Flow (vph)	683	2133	0	0	1906	754	495	0	526	0	0	0
Confl. Peds. (#/hr)			3	3								
Heavy Vehicles (%)	2%	3%	0%	0%	2%	2%	2%	0%	4%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Prot		Perm			
Protected Phases	5	2			6		8					
Permitted Phases						6			8			
Actuated Green, G (s)	26.8	90.8			60.0	60.0	27.2		27.2			
Effective Green, g (s)	26.8	90.8			60.0	60.0	27.2		27.2			
Actuated g/C Ratio	0.21	0.70			0.46	0.46	0.21		0.21			
Clearance Time (s)	4.0	6.0			6.0	6.0	6.0		6.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0			
Lane Grp Cap (vph)	707	3517			2346	730	718		571			
v/s Ratio Prot	c0.20	0.42			0.37		0.14					
v/s Ratio Perm						c0.48			c0.19			
v/c Ratio	0.97	0.61			0.81	1.03	0.69		0.92			
Uniform Delay, d1	51.1	10.3			30.2	35.0	47.5		50.4			
Progression Factor	0.66	1.45			0.68	0.97	1.00		1.00			
Incremental Delay, d2	16.7	0.4			0.3	20.0	2.8		20.5			
Delay (s)	50.7	15.3			20.9	54.0	50.3		70.8			
Level of Service	D	B			C	D	D		E			
Approach Delay (s)		23.9			32.7			61.3			0.0	
Approach LOS		C			C			E			A	

Intersection Summary

HCM 2000 Control Delay	33.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	112.6%	ICU Level of Service	H
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)	417	1900	70	72	1784	256	693	91	227	50	492
v/c Ratio	1.19	1.02	0.11	0.44	1.12	0.43	0.84	0.21	0.71	0.15	1.22
Control Delay	162.1	45.8	0.5	26.8	90.1	6.6	56.7	33.0	64.8	48.8	152.6
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	162.1	45.8	0.5	26.8	90.2	6.6	56.7	33.0	64.8	48.8	152.6
Queue Length 50th (m)	~68.5	~209.5	0.2	7.2	~197.6	5.1	91.3	16.3	58.8	11.6	~132.1
Queue Length 95th (m)	m#98.9	#236.0	m0.4	m8.1	m#226.7	m6.9	111.0	30.6	#105.9	24.6	#211.8
Internal Link Dist (m)		225.6			141.6			127.2		94.6	
Turn Bay Length (m)	160.0		175.0	50.0			50.0		60.0		
Base Capacity (vph)	350	1855	660	163	1588	601	933	491	318	335	402
Starvation Cap Reductn	0	0	0	0	44	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	1.19	1.02	0.11	0.44	1.16	0.43	0.74	0.19	0.71	0.15	1.22

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.
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)	417	1900	70	72	1784	256	693	65	26	227	50	492
Future Volume (vph)	417	1900	70	72	1784	256	693	65	26	227	50	492
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		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)	3502	4940	1578	1787	5036	1529	3467	1786		1805	1900	1615
Flt Permitted	0.95	1.00	1.00	0.10	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	4940	1578	184	5036	1529	3467	1786		1805	1900	1615
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)	417	1900	70	72	1784	256	693	65	26	227	50	492
RTOR Reduction (vph)	0	0	44	0	0	119	0	11	0	0	0	118
Lane Group Flow (vph)	417	1900	26	72	1784	137	693	80	0	227	50	374
Confl. Peds. (#/hr)	3		1	1		3			2	2		
Heavy Vehicles (%)	0%	5%	1%	1%	3%	4%	1%	2%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2	6		6						4
Actuated Green, G (s)	13.0	48.0	48.0	47.0	41.0	41.0	31.0	31.0		23.0	23.0	23.0
Effective Green, g (s)	13.0	48.0	48.0	47.0	41.0	41.0	31.0	31.0		23.0	23.0	23.0
Actuated g/C Ratio	0.10	0.37	0.37	0.36	0.32	0.32	0.24	0.24		0.18	0.18	0.18
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	350	1824	582	140	1588	482	826	425		319	336	285
v/s Ratio Prot	c0.12	0.38		0.02	c0.35		c0.20	0.04		0.13	0.03	
v/s Ratio Perm			0.02	0.16		0.09						c0.23
v/c Ratio	1.19	1.04	0.04	0.51	1.12	0.28	0.84	0.19		0.71	0.15	1.31
Uniform Delay, d1	58.5	41.0	26.3	33.1	44.5	33.5	47.1	39.5		50.4	45.2	53.5
Progression Factor	1.19	0.46	0.23	1.14	0.70	0.50	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	105.4	30.1	0.1	1.2	59.2	0.6	7.5	0.2		7.3	0.2	163.8
Delay (s)	175.0	49.1	6.0	38.8	90.6	17.3	54.6	39.7		57.7	45.4	217.3
Level of Service	F	D	A	D	F	B	D	D		E	D	F
Approach Delay (s)		69.8			79.9			52.9			159.0	
Approach LOS		E			E			D			F	

Intersection Summary

HCM 2000 Control Delay	82.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	99.7%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	598	1415	142	55	1515	226	313	358	175	595
v/c Ratio	0.92	0.57	0.19	0.27	0.93	0.87	0.45	0.95	0.20	0.97
Control Delay	77.4	20.2	5.5	19.5	52.9	89.2	38.8	70.0	38.6	50.5
Queue Delay	0.0	0.2	0.0	0.0	45.1	0.0	0.0	0.0	0.0	2.8
Total Delay	77.4	20.4	5.5	19.5	98.1	89.2	38.8	70.0	38.6	53.3
Queue Length 50th (m)	88.8	61.8	5.7	6.7	147.0	31.6	31.1	73.9	19.1	80.8
Queue Length 95th (m)	m88.0	m61.0	m6.0	13.4	#183.9	#54.6	45.6	#132.6	29.2	#157.0
Internal Link Dist (m)		141.6			238.0		219.7		226.0	
Turn Bay Length (m)	70.0		50.0	120.0		95.0		110.0		45.0
Base Capacity (vph)	647	2481	731	204	1628	261	781	378	964	648
Starvation Cap Reductn	0	300	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	297	0	0	0	0	19
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.65	0.19	0.27	1.14	0.87	0.40	0.95	0.18	0.95

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)	598	1415	142	55	1292	223	226	212	101	358	175	595
Future Volume (vph)	598	1415	142	55	1292	223	226	212	101	358	175	595
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3303	5085	1367	1703	4865		3467	3308		1686	3574	1524
Flt Permitted	0.95	1.00	1.00	0.17	1.00		0.95	1.00		0.40	1.00	1.00
Satd. Flow (perm)	3303	5085	1367	306	4865		3467	3308		710	3574	1524
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)	598	1415	142	55	1292	223	226	212	101	358	175	595
RTOR Reduction (vph)	0	0	65	0	18	0	0	45	0	0	0	245
Lane Group Flow (vph)	598	1415	77	55	1497	0	226	268	0	358	175	350
Confl. Peds. (#/hr)	1		4	4		1			1	1		
Heavy Vehicles (%)	6%	2%	16%	6%	2%	16%	1%	5%	0%	7%	1%	6%
Turn Type	Prot	NA	Perm	pm+pt	NA		Prot	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)	25.5	62.6	62.6	48.9	43.0		9.8	25.6		45.5	31.7	31.7
Effective Green, g (s)	25.5	62.6	62.6	48.9	43.0		9.8	25.6		45.5	31.7	31.7
Actuated g/C Ratio	0.20	0.48	0.48	0.38	0.33		0.08	0.20		0.35	0.24	0.24
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
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)	647	2448	658	178	1609		261	651		367	871	371
v/s Ratio Prot	c0.18	0.28		0.01	c0.31		0.07	0.08		c0.12	0.05	
v/s Ratio Perm			0.06	0.10						c0.22		0.23
v/c Ratio	0.92	0.58	0.12	0.31	0.93		0.87	0.41		0.98	0.20	0.94
Uniform Delay, d1	51.3	24.2	18.5	26.2	42.1		59.5	45.6		38.6	39.1	48.3
Progression Factor	1.39	0.79	1.11	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.5	0.3	0.1	1.0	11.0		24.6	0.4		40.1	0.1	32.3
Delay (s)	77.7	19.5	20.6	27.1	53.1		84.0	46.0		78.7	39.2	80.5
Level of Service	E	B	C	C	D		F	D		E	D	F
Approach Delay (s)		35.7			52.2			62.0			73.5	
Approach LOS		D			D			E			E	

Intersection Summary

HCM 2000 Control Delay	51.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	93.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	278	28	17	103	931	13	1117
v/c Ratio	0.64	0.17	0.06	0.32	0.40	0.03	0.55
Control Delay	30.5	34.1	15.3	8.3	9.4	6.2	14.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.5	34.1	15.3	8.3	9.4	6.2	14.8
Queue Length 50th (m)	16.5	4.8	0.2	6.5	42.6	0.8	75.9
Queue Length 95th (m)	30.8	12.2	6.0	14.2	84.4	3.1	107.6
Internal Link Dist (m)	115.4		50.9		226.0		199.1
Turn Bay Length (m)				70.0		50.0	
Base Capacity (vph)	752	168	413	319	2338	468	2018
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.17	0.04	0.32	0.40	0.03	0.55

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	149	1	128	28	1	16	103	902	29	13	970	147
Future Volume (vph)	149	1	128	28	1	16	103	902	29	13	970	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor		0.95		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.93		1.00	0.86		1.00	1.00		1.00	0.98	
Flt Protected		0.97		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3243		1442	1632		1656	3426		1805	3380	
Flt Permitted		0.81		0.35	1.00		0.18	1.00		0.30	1.00	
Satd. Flow (perm)		2689		534	1632		321	3426		561	3380	
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)	149	1	128	28	1	16	103	902	29	13	970	147
RTOR Reduction (vph)	0	113	0	0	13	0	0	1	0	0	8	0
Lane Group Flow (vph)	0	165	0	28	4	0	103	930	0	13	1109	0
Confl. Peds. (#/hr)			6	6			7		2	2		7
Heavy Vehicles (%)	0%	0%	0%	25%	0%	0%	9%	5%	0%	0%	5%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		12.4		20.4	20.4		75.7	70.4		66.0	64.7	
Effective Green, g (s)		12.4		20.4	20.4		75.7	70.4		66.0	64.7	
Actuated g/C Ratio		0.11		0.19	0.19		0.70	0.65		0.61	0.60	
Clearance Time (s)		6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		308		134	307		311	2231		357	2022	
v/s Ratio Prot				c0.01	0.00		c0.02	0.27		0.00	c0.33	
v/s Ratio Perm		c0.06		0.03			0.21			0.02		
v/c Ratio		0.53		0.21	0.01		0.33	0.42		0.04	0.55	
Uniform Delay, d1		45.1		36.5	35.7		7.4	9.0		8.3	13.0	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.8		0.8	0.0		0.6	0.6		0.0	1.1	
Delay (s)		46.9		37.3	35.7		8.0	9.6		8.3	14.0	
Level of Service		D		D	D		A	A		A	B	
Approach Delay (s)		46.9			36.7			9.4			14.0	
Approach LOS		D			D			A			B	

Intersection Summary

HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	108.1	Sum of lost time (s)	20.0
Intersection Capacity Utilization	84.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	154	1	93	1	89	978	1192
v/c Ratio	0.59	0.00	0.37	0.00	0.25	0.38	0.53
Control Delay	47.1	35.0	11.1	0.0	5.3	5.5	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.1	35.0	11.1	0.0	5.3	5.5	11.5
Queue Length 50th (m)	28.1	0.2	0.0	0.0	2.9	25.5	56.3
Queue Length 95th (m)	48.4	1.6	12.3	0.0	11.3	62.0	113.8
Internal Link Dist (m)		62.1		66.5		199.1	252.7
Turn Bay Length (m)	25.0				70.0		
Base Capacity (vph)	261	480	386	522	383	2562	2235
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.00	0.24	0.00	0.23	0.38	0.53

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	154	1	93	0	0	1	89	977	1	0	1037	155
Future Volume (vph)	154	1	93	0	0	1	89	977	1	0	1037	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0		6.0		4.0	6.0			6.0	
Lane Util. Factor	1.00	1.00	1.00		1.00		1.00	0.95			0.95	
Frpb, ped/bikes	1.00	1.00	1.00		1.00		1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85		0.85		1.00	1.00			0.98	
Flt Protected	0.95	1.00	1.00		1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1770	1900	1233		1615		1805	3471			3469	
Flt Permitted	0.70	1.00	1.00		1.00		0.17	1.00			1.00	
Satd. Flow (perm)	1307	1900	1233		1615		317	3471			3469	
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)	154	1	93	0	0	1	89	977	1	0	1037	155
RTOR Reduction (vph)	0	0	77	0	1	0	0	0	0	0	8	0
Lane Group Flow (vph)	154	1	16	0	0	0	89	978	0	0	1184	0
Confl. Peds. (#/hr)							2		2	2		2
Heavy Vehicles (%)	2%	0%	31%	0%	0%	0%	0%	4%	0%	0%	2%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	17.6	17.6	17.6		1.7		70.7	70.7			60.8	
Effective Green, g (s)	17.6	17.6	17.6		1.7		70.7	70.7			60.8	
Actuated g/C Ratio	0.18	0.18	0.18		0.02		0.70	0.70			0.61	
Clearance Time (s)	4.0	6.0	6.0		6.0		4.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	284	333	216		27		310	2446			2102	
v/s Ratio Prot	c0.06	0.00			0.00		0.02	c0.28			c0.34	
v/s Ratio Perm	c0.03		0.01				0.19					
v/c Ratio	0.54	0.00	0.08		0.00		0.29	0.40			0.56	
Uniform Delay, d1	37.4	34.1	34.6		48.5		6.9	6.1			11.8	
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00			1.00	
Incremental Delay, d2	2.1	0.0	0.1		0.0		0.5	0.5			1.1	
Delay (s)	39.5	34.1	34.7		48.5		7.4	6.6			12.9	
Level of Service	D	C	C		D		A	A			B	
Approach Delay (s)		37.7			48.5			6.6			12.9	
Approach LOS		D			D			A			B	

Intersection Summary

HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	100.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	76.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	101	23	62	70	32	64	1015	89	1174
v/c Ratio	0.26	0.07	0.17	0.19	0.11	0.23	0.57	0.33	0.65
Control Delay	34.0	42.1	3.3	33.1	21.8	10.0	21.2	11.7	22.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.0	42.1	3.3	33.1	21.8	10.0	21.2	11.7	22.9
Queue Length 50th (m)	18.8	4.8	0.0	12.8	1.9	5.5	86.7	7.8	106.2
Queue Length 95th (m)	33.6	12.6	4.2	24.9	11.2	10.8	107.0	14.5	130.0
Internal Link Dist (m)		132.6			203.0		252.7		204.9
Turn Bay Length (m)	50.0		50.0	30.0		70.0		65.0	
Base Capacity (vph)	390	332	361	360	297	283	1794	270	1808
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	0.26	0.07	0.17	0.19	0.11	0.23	0.57	0.33	0.65

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	101	23	62	70	9	23	64	965	50	89	1060	114
Future Volume (vph)	101	23	62	70	9	23	64	965	50	89	1060	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.89		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1900	1593	1717	1671		1805	3467		1455	3489	
Flt Permitted	0.70	1.00	1.00	0.74	1.00		0.15	1.00		0.20	1.00	
Satd. Flow (perm)	1332	1900	1593	1342	1671		278	3467		304	3489	
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)	101	23	62	70	9	23	64	965	50	89	1060	114
RTOR Reduction (vph)	0	0	51	0	19	0	0	3	0	0	7	0
Lane Group Flow (vph)	101	23	11	70	13	0	64	1012	0	89	1167	0
Confl. Peds. (#/hr)			1	1			3		3	3		3
Heavy Vehicles (%)	0%	0%	0%	5%	0%	2%	0%	3%	8%	24%	2%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	30.0	21.0	21.0	28.0	20.0		71.0	62.0		71.0	62.0	
Effective Green, g (s)	30.0	21.0	21.0	28.0	20.0		71.0	62.0		71.0	62.0	
Actuated g/C Ratio	0.25	0.18	0.18	0.23	0.17		0.59	0.52		0.59	0.52	
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Grp Cap (vph)	368	332	278	338	278		279	1791		266	1802	
v/s Ratio Prot	c0.02	0.01		0.01	0.01		0.02	0.29		c0.03	c0.33	
v/s Ratio Perm	c0.05		0.01	0.03			0.12			0.17		
v/c Ratio	0.27	0.07	0.04	0.21	0.05		0.23	0.57		0.33	0.65	
Uniform Delay, d1	35.8	41.3	41.1	36.8	42.0		13.2	19.8		12.4	21.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.8	0.4	0.3	1.4	0.3		1.9	1.3		3.4	1.8	
Delay (s)	37.6	41.7	41.4	38.2	42.3		15.1	21.1		15.8	22.9	
Level of Service	D	D	D	D	D		B	C		B	C	
Approach Delay (s)		39.4			39.5			20.7			22.4	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM 2000 Control Delay	23.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	72.5%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	0	9	82	0	32	7	1084	20	8	1006	6
Future Volume (Veh/h)	25	0	9	82	0	32	7	1084	20	8	1006	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	25	0	9	82	0	32	7	1084	20	8	1006	6
Pedestrians					3						1	
Lane Width (m)					3.6						3.6	
Walking Speed (m/s)					1.2						1.2	
Percent Blockage					0						0	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								229				
pX, platoon unblocked	0.81	0.81		0.81	0.81	0.81				0.81		
vC, conflicting volume	1614	2146	506	1639	2139	556	1012			1107		
vC1, stage 1 conf vol	1025	1025		1111	1111							
vC2, stage 2 conf vol	589	1121		528	1028							
vCu, unblocked vol	1280	1940	506	1311	1932	0	1012			651		
tC, single (s)	7.5	6.5	6.9	7.6	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.6	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	89	100	98	70	100	96	99			99		
cM capacity (veh/h)	237	230	512	277	230	876	681			759		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	34	114	7	723	381	8	671	341
Volume Left	25	82	7	0	0	8	0	0
Volume Right	9	32	0	0	20	0	0	6
cSH	276	343	681	1700	1700	759	1700	1700
Volume to Capacity	0.12	0.33	0.01	0.43	0.22	0.01	0.39	0.20
Queue Length 95th (m)	3.3	11.4	0.2	0.0	0.0	0.3	0.0	0.0
Control Delay (s)	19.9	20.6	10.3	0.0	0.0	9.8	0.0	0.0
Lane LOS	C	C	B			A		
Approach Delay (s)	19.9	20.6	0.1			0.1		
Approach LOS	C	C						

Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	44.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	110	110	41	1097	911	28
Future Volume (Veh/h)	110	110	41	1097	911	28
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	110	110	41	1097	911	28
Pedestrians	1					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)					276	
pX, platoon unblocked	0.92	0.92	0.92			
vC, conflicting volume	1556	470	940			
vC1, stage 1 conf vol	926					
vC2, stage 2 conf vol	630					
vCu, unblocked vol	1439	265	773			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	65	84	95			
cM capacity (veh/h)	315	683	787			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	110	110	41	548	548	607	332
Volume Left	110	0	41	0	0	0	0
Volume Right	0	110	0	0	0	0	28
cSH	315	683	787	1700	1700	1700	1700
Volume to Capacity	0.35	0.16	0.05	0.32	0.32	0.36	0.20
Queue Length 95th (m)	12.2	4.6	1.3	0.0	0.0	0.0	0.0
Control Delay (s)	22.5	11.3	9.8	0.0	0.0	0.0	0.0
Lane LOS	C	B	A				
Approach Delay (s)	16.9		0.4			0.0	
Approach LOS	C						

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	45.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	35	27	10	1166	878	17
Future Volume (Veh/h)	35	27	10	1166	878	17
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	35	27	10	1166	878	17
Pedestrians	2					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)					122	
pX, platoon unblocked	0.91	0.91	0.91			
vC, conflicting volume	1492	450	897			
vC1, stage 1 conf vol	888					
vC2, stage 2 conf vol	603					
vCu, unblocked vol	1344	200	691			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	96	99			
cM capacity (veh/h)	342	740	830			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	62	10	583	583	585	310
Volume Left	35	10	0	0	0	0
Volume Right	27	0	0	0	0	17
cSH	447	830	1700	1700	1700	1700
Volume to Capacity	0.14	0.01	0.34	0.34	0.34	0.18
Queue Length 95th (m)	3.8	0.3	0.0	0.0	0.0	0.0
Control Delay (s)	14.3	9.4	0.0	0.0	0.0	0.0
Lane LOS	B	A				
Approach Delay (s)	14.3	0.1			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	42.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	219	861	220	295	589	228	432	769	176	371	240
v/c Ratio	0.75	0.84	0.42	0.90	0.53	0.39	0.88	0.73	0.65	0.52	0.51
Control Delay	37.5	48.3	15.8	60.9	36.0	15.2	46.4	39.6	34.2	45.5	9.2
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	37.5	48.3	15.8	60.9	36.0	15.2	46.4	39.6	34.2	45.5	9.2
Queue Length 50th (m)	32.5	105.7	15.6	53.5	63.4	16.7	77.9	84.4	26.5	43.6	0.0
Queue Length 95th (m)	#52.5	#132.3	38.7	#104.9	82.2	39.2	#117.7	108.3	42.5	60.0	22.8
Internal Link Dist (m)		844.2			279.6			97.5		104.6	
Turn Bay Length (m)	25.0		25.0	40.0		25.0	100.0		40.0		50.0
Base Capacity (vph)	299	1023	530	337	1113	587	495	1050	284	715	473
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	0.73	0.84	0.42	0.88	0.53	0.39	0.87	0.73	0.62	0.52	0.51

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)	219	861	220	295	589	228	432	535	234	176	371	240
Future Volume (vph)	219	861	220	295	589	228	432	535	234	176	371	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		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)	1253	3471	1476	1770	3574	1583	1735	3388		1770	3539	1396
Flt Permitted	0.32	1.00	1.00	0.11	1.00	1.00	0.35	1.00		0.26	1.00	1.00
Satd. Flow (perm)	421	3471	1476	213	3574	1583	640	3388		482	3539	1396
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)	219	861	220	295	589	228	432	535	234	176	371	240
RTOR Reduction (vph)	0	0	96	0	0	94	0	41	0	0	0	191
Lane Group Flow (vph)	219	861	124	295	589	134	432	728	0	176	371	49
Confl. Peds. (#/hr)			1	1			2					2
Heavy Vehicles (%)	44%	4%	8%	2%	1%	2%	4%	2%	1%	2%	2%	14%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	50.2	35.0	35.0	54.2	37.0	37.0	50.5	35.4		35.1	24.0	24.0
Effective Green, g (s)	50.2	35.0	35.0	54.2	37.0	37.0	50.5	35.4		35.1	24.0	24.0
Actuated g/C Ratio	0.42	0.29	0.29	0.46	0.31	0.31	0.43	0.30		0.30	0.20	0.20
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	6.0
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)	284	1023	435	322	1114	493	479	1010		262	715	282
v/s Ratio Prot	0.10	0.25		c0.13	0.16		c0.17	0.21		0.06	0.10	
v/s Ratio Perm	0.23		0.08	c0.29		0.08	c0.21			0.14		0.03
v/c Ratio	0.77	0.84	0.29	0.92	0.53	0.27	0.90	0.72		0.67	0.52	0.17
Uniform Delay, d1	24.5	39.3	32.2	32.2	33.7	30.7	26.8	37.2		33.0	42.2	39.1
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	12.2	6.4	0.4	29.4	0.5	0.3	20.0	4.4		6.6	2.7	1.3
Delay (s)	36.7	45.6	32.6	61.6	34.1	31.0	46.8	41.7		39.6	44.9	40.5
Level of Service	D	D	C	E	C	C	D	D		D	D	D
Approach Delay (s)		41.9			40.8			43.5			42.3	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	42.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	118.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	106.1%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	115	1404	220	1418	104	439	50	50
v/c Ratio	0.38	0.48	0.60	0.43	0.47	0.74	0.29	0.16
Control Delay	10.1	17.2	40.0	2.0	52.1	22.4	46.5	31.2
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	10.1	17.2	40.0	2.0	52.1	22.4	46.5	31.2
Queue Length 50th (m)	7.2	75.2	27.6	7.3	24.4	14.7	11.4	3.2
Queue Length 95th (m)	15.2	111.5	55.6	8.5	39.7	31.6	22.0	9.5
Internal Link Dist (m)		279.3		65.0		101.6		166.7
Turn Bay Length (m)	60.0		50.0		45.0		50.0	
Base Capacity (vph)	341	2952	458	3330	219	916	177	692
Starvation Cap Reductn	0	0	0	467	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	0.34	0.48	0.48	0.50	0.47	0.48	0.28	0.07

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	1285	119	220	1404	14	104	107	332	50	24	26
Future Volume (vph)	115	1285	119	220	1404	14	104	107	332	50	24	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.89		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	4975		1769	5125		1792	3144		1787	3237	
Flt Permitted	0.16	1.00		0.14	1.00		0.58	1.00		0.40	1.00	
Satd. Flow (perm)	311	4975		252	5125		1091	3144		752	3237	
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	1285	119	220	1404	14	104	107	332	50	24	26
RTOR Reduction (vph)	0	6	0	0	1	0	0	300	0	0	24	0
Lane Group Flow (vph)	115	1398	0	220	1417	0	104	139	0	50	26	0
Confl. Peds. (#/hr)	8		7	7		8	10		1	1		10
Heavy Vehicles (%)	0%	3%	0%	2%	1%	4%	0%	0%	1%	1%	3%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	83.8	75.8		95.2	83.2		21.3	12.5		16.3	10.0	
Effective Green, g (s)	83.8	75.8		95.2	83.2		21.3	12.5		16.3	10.0	
Actuated g/C Ratio	0.64	0.58		0.73	0.64		0.16	0.10		0.13	0.08	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	292	2900		364	3280		226	302		144	249	
v/s Ratio Prot	0.02	0.28		c0.07	0.28		c0.03	0.04		0.02	0.01	
v/s Ratio Perm	0.23			c0.37			c0.04			0.03		
v/c Ratio	0.39	0.48		0.60	0.43		0.46	0.46		0.35	0.10	
Uniform Delay, d1	9.0	15.7		9.7	11.6		48.3	55.6		51.3	55.8	
Progression Factor	1.00	1.00		4.15	0.14		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.6		2.1	0.3		1.5	1.1		1.5	0.2	
Delay (s)	9.8	16.3		42.3	1.9		49.8	56.7		52.8	56.0	
Level of Service	A	B		D	A		D	E		D	E	
Approach Delay (s)		15.8			7.4			55.3			54.4	
Approach LOS		B			A			E			D	

Intersection Summary			
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	76.3%	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)	6	857	5	144	857	129	72	389	278	384	367	104
v/c Ratio	0.03	0.57	0.01	0.83	0.57	0.17	0.16	0.23	0.35	0.86	0.22	0.13
Control Delay	21.2	28.0	0.0	68.1	28.0	4.3	19.1	19.0	15.7	49.0	18.9	6.8
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	21.2	28.0	0.0	68.1	28.0	4.3	19.1	19.0	15.7	49.0	18.9	6.8
Queue Length 50th (m)	0.9	83.3	0.0	31.1	83.3	0.3	9.9	29.1	30.1	82.5	27.2	3.9
Queue Length 95th (m)	3.7	104.0	0.0	#72.2	104.0	12.0	19.6	39.7	50.8	#145.7	37.6	13.8
Internal Link Dist (m)		259.3			844.2			279.0			144.9	
Turn Bay Length (m)	60.0		60.0	60.0		60.0	60.0		60.0	60.0		60.0
Base Capacity (vph)	174	1504	688	174	1504	745	458	1681	790	445	1681	790
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	0.03	0.57	0.01	0.83	0.57	0.17	0.16	0.23	0.35	0.86	0.22	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)	6	857	5	144	857	129	72	389	278	384	367	104
Future Volume (vph)	6	857	5	144	857	129	72	389	278	384	367	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	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)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.22	1.00	1.00	0.22	1.00	1.00	0.52	1.00	1.00	0.50	1.00	1.00
Satd. Flow (perm)	409	3539	1583	409	3539	1583	966	3539	1583	937	3539	1583
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)	6	857	5	144	857	129	72	389	278	384	367	104
RTOR Reduction (vph)	0	0	3	0	0	73	0	0	39	0	0	39
Lane Group Flow (vph)	6	857	2	144	857	56	72	389	239	384	367	65
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	51.0	51.0	51.0	51.0	51.0	51.0	57.0	57.0	57.0	57.0	57.0	57.0
Effective Green, g (s)	51.0	51.0	51.0	51.0	51.0	51.0	57.0	57.0	57.0	57.0	57.0	57.0
Actuated g/C Ratio	0.42	0.42	0.42	0.42	0.42	0.42	0.48	0.48	0.48	0.48	0.48	0.48
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Grp Cap (vph)	173	1504	672	173	1504	672	458	1681	751	445	1681	751
v/s Ratio Prot		0.24			0.24			0.11			0.10	
v/s Ratio Perm	0.01		0.00	c0.35		0.04	0.07		0.15	c0.41		0.04
v/c Ratio	0.03	0.57	0.00	0.83	0.57	0.08	0.16	0.23	0.32	0.86	0.22	0.09
Uniform Delay, d1	20.1	26.2	19.9	30.7	26.2	20.6	17.9	18.6	19.5	28.0	18.5	17.2
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	0.4	1.6	0.0	35.2	1.6	0.2	0.7	0.3	1.1	19.4	0.3	0.2
Delay (s)	20.5	27.7	19.9	65.9	27.7	20.8	18.6	18.9	20.6	47.4	18.7	17.5
Level of Service	C	C	B	E	C	C	B	B	C	D	B	B
Approach Delay (s)		27.7			31.8			19.5			31.5	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	28.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	83.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	B38	B38	B38	WB	WB	WB	WB
Directions Served	L	T	T	T	TR	T	T	T	L	L	T	T
Maximum Queue (m)	77.3	109.4	110.0	95.7	89.2	39.4	46.6	28.8	63.0	75.7	90.5	103.9
Average Queue (m)	18.4	69.4	72.6	59.7	49.5	2.5	4.0	1.6	32.1	38.9	26.8	37.2
95th Queue (m)	53.6	108.0	110.8	94.0	76.8	18.0	23.5	15.3	51.8	59.7	63.5	75.1
Link Distance (m)		86.8	86.8	86.8	86.8	65.4	65.4	65.4			114.0	114.0
Upstream Blk Time (%)		5	6	1	0	0	0	0			0	0
Queuing Penalty (veh)		22	26	4	2	0	1	1			0	0
Storage Bay Dist (m)	70.0								65.0	65.0		
Storage Blk Time (%)		12							0	1	0	
Queuing Penalty (veh)		6							2	3	1	

Intersection: 3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

Movement	WB	NB	NB	NB	SB	SB	SB
Directions Served	TR	L	T	R	L	T	TR
Maximum Queue (m)	100.9	33.0	47.0	90.7	47.4	178.8	115.8
Average Queue (m)	45.3	10.3	19.4	82.0	46.9	123.7	18.5
95th Queue (m)	82.1	24.6	38.1	108.6	50.3	208.2	77.7
Link Distance (m)	114.0		86.1	86.1		180.4	180.4
Upstream Blk Time (%)	0			48		18	0
Queuing Penalty (veh)	0			0		0	0
Storage Bay Dist (m)		20.0			40.0		
Storage Blk Time (%)		3	17		74	0	
Queuing Penalty (veh)		3	10		7	1	

Intersection: 6: Mapleview Drive W & Highway 400 SB Off-Ramp

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	T	R	L	T	T	T	L	L	R
Maximum Queue (m)	120.4	124.3	113.1	113.6	71.5	119.1	60.8	55.4	59.6	307.5	360.0	352.1
Average Queue (m)	80.1	87.8	69.0	60.6	13.1	59.9	34.7	35.9	44.3	279.5	312.6	231.2
95th Queue (m)	125.5	129.2	113.3	98.8	48.8	101.3	51.7	49.5	58.4	360.7	413.1	464.1
Link Distance (m)	114.0	114.0	114.0	114.0			168.4	168.4	168.4		326.9	326.9
Upstream Blk Time (%)	1	2	0	0							57	28
Queuing Penalty (veh)	7	10	2	1							0	0
Storage Bay Dist (m)					45.0	135.0				300.0		
Storage Blk Time (%)				18		0				10	60	33
Queuing Penalty (veh)				34		0				33	203	45

Intersection: 6: Mapleview Drive W & Highway 400 SB Off-Ramp

Movement	SB	B36	B36
Directions Served	R	T	T
Maximum Queue (m)	307.5	191.1	189.2
Average Queue (m)	152.7	92.0	85.9
95th Queue (m)	377.4	224.2	216.4
Link Distance (m)		176.9	176.9
Upstream Blk Time (%)		24	19
Queuing Penalty (veh)		0	0
Storage Bay Dist (m)	300.0		
Storage Blk Time (%)	0		
Queuing Penalty (veh)	0		

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (m)	113.3	143.4	160.6	149.4	124.9	99.4	69.6	96.3	157.7	92.8	82.0	113.8
Average Queue (m)	60.9	65.7	55.8	41.5	43.7	68.2	45.5	50.3	104.4	51.7	50.4	65.9
95th Queue (m)	103.6	112.5	133.1	107.8	94.5	95.5	64.8	85.9	162.2	78.4	74.0	98.3
Link Distance (m)		168.4	168.4	168.4	168.4	218.3	218.3	218.3			335.8	335.8
Upstream Blk Time (%)		0	0	0								
Queuing Penalty (veh)		1	1	0								
Storage Bay Dist (m)	130.0								130.0	265.0		
Storage Blk Time (%)	0	0							8			
Queuing Penalty (veh)	1	1							52			

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	NB
Directions Served	R
Maximum Queue (m)	93.6
Average Queue (m)	50.7
95th Queue (m)	86.1
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	265.0
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	L
Maximum Queue (m)	147.2	152.4	172.1	150.3	151.4	15.4	57.3	128.6	133.6	145.5	166.6	57.4
Average Queue (m)	91.1	96.3	95.3	72.6	81.9	4.4	15.2	68.5	104.4	124.0	111.5	56.0
95th Queue (m)	152.8	160.5	166.3	118.8	127.5	12.1	42.0	118.6	145.4	154.0	219.5	64.3
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)			1					0	0	9	13	
Queuing Penalty (veh)			6					3	3	45	66	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)	5	7	0		0		0	19				11
Queuing Penalty (veh)	33	46	1		0		0	14				38

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R
Maximum Queue (m)	140.8	134.2	67.3	100.6	100.6
Average Queue (m)	132.5	85.4	43.9	52.4	100.6
95th Queue (m)	144.2	175.8	72.0	125.5	100.6
Link Distance (m)	128.7	128.7		96.0	96.0
Upstream Blk Time (%)	65	15		7	92
Queuing Penalty (veh)	0	0		0	0
Storage Bay Dist (m)			60.0		
Storage Blk Time (%)	64		13		
Queuing Penalty (veh)	220		7		

Intersection: 15: Bayview Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	T	R	L	T	T	TR	L	L
Maximum Queue (m)	82.3	94.9	127.2	55.1	56.8	32.1	23.1	250.4	254.8	260.1	63.7	78.1
Average Queue (m)	66.6	73.0	44.8	37.2	38.4	13.4	5.9	126.2	232.3	251.1	27.8	46.8
95th Queue (m)	87.4	98.7	99.0	54.7	55.0	26.6	16.0	276.8	318.9	257.3	57.1	74.6
Link Distance (m)			131.2	131.2	131.2			244.4	244.4	244.4		
Upstream Blk Time (%)			1					3	40	96		
Queuing Penalty (veh)			7					0	0	0		
Storage Bay Dist (m)	70.0	70.0				50.0	120.0				95.0	95.0
Storage Blk Time (%)	13	24			3			0				
Queuing Penalty (veh)	60	114			4			0				

Intersection: 15: Bayview Drive & Mapleview Drive W

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	TR	L	T	T	R
Maximum Queue (m)	73.4	61.6	117.5	218.0	223.0	80.0
Average Queue (m)	34.8	32.0	112.1	172.7	98.0	60.5
95th Queue (m)	58.4	54.4	138.2	285.7	225.2	99.4
Link Distance (m)	218.2	218.2		214.5	214.5	
Upstream Blk Time (%)				24	1	
Queuing Penalty (veh)				135	4	
Storage Bay Dist (m)			110.0			45.0
Storage Blk Time (%)			70	4	0	30
Queuing Penalty (veh)			61	13	2	26

Intersection: 18: Bayview Drive & South Village Way/Barrie Molson Centre D/W

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	54.8	80.9	34.3	14.1	60.1	90.7	93.9	37.7	173.3	190.9
Average Queue (m)	28.0	28.4	10.8	3.3	16.9	36.5	38.1	6.2	92.6	115.2
95th Queue (m)	47.6	75.0	29.6	11.4	36.9	78.3	79.3	32.5	209.5	219.0
Link Distance (m)	126.0	126.0	60.2	60.2		214.5	214.5		195.2	195.2
Upstream Blk Time (%)		0							11	7
Queuing Penalty (veh)		0							62	37
Storage Bay Dist (m)					70.0			50.0		
Storage Blk Time (%)					0	2			36	
Queuing Penalty (veh)					0	2			5	

Intersection: 21: Bayview Drive & North Village Way/Private D/W

Movement	EB	EB	EB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	R	TR	L	T	TR	T	TR
Maximum Queue (m)	42.1	42.9	55.9	1.6	24.0	63.3	65.0	196.8	203.3
Average Queue (m)	24.6	3.6	24.8	0.1	10.1	19.3	20.6	66.8	86.7
95th Queue (m)	41.3	26.9	57.8	1.1	19.9	47.0	48.4	184.6	197.7
Link Distance (m)		71.5	71.5	75.9		195.2	195.2	247.7	247.7
Upstream Blk Time (%)		0	6					2	3
Queuing Penalty (veh)		0	0					14	19
Storage Bay Dist (m)	25.0				70.0				
Storage Blk Time (%)	15					0		14	
Queuing Penalty (veh)	0					0		0	

Intersection: 24: Bayview Drive & Concert Way/Churchill Drive

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	39.6	28.7	23.8	32.8	30.7	54.6	96.0	99.0	72.3	132.0	138.9
Average Queue (m)	16.3	5.7	9.3	14.0	6.7	11.0	56.1	57.7	22.0	76.2	92.2
95th Queue (m)	31.6	18.6	19.5	28.1	19.4	33.6	88.5	92.1	56.9	141.0	151.3
Link Distance (m)		140.4			212.1		247.7	247.7		206.2	206.2
Upstream Blk Time (%)										3	3
Queuing Penalty (veh)										15	18
Storage Bay Dist (m)	50.0		50.0	30.0		70.0			65.0		
Storage Blk Time (%)	0	0		2	0		3		0	8	
Queuing Penalty (veh)	0	0		1	0		2		0	7	

Intersection: 28: Bayview Drive & Industrial Site D/W South/Coca-Cola D/W

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (m)	34.6	105.9	8.0	7.2	5.9	10.6	44.2	47.0
Average Queue (m)	10.2	38.3	0.8	0.2	0.2	1.0	8.9	9.5
95th Queue (m)	24.1	88.8	4.9	3.4	3.0	6.9	69.4	70.8
Link Distance (m)	196.7	182.1		206.2	206.2		206.3	206.3
Upstream Blk Time (%)		1					0	0
Queuing Penalty (veh)		0					0	0
Storage Bay Dist (m)			15.0			15.0		
Storage Blk Time (%)				0		0	4	
Queuing Penalty (veh)				0		1	0	

Intersection: 29: Bayview Drive & Medical Centre South D/W - Industrial Site D/W North

Movement	EB	EB	NB	NB	NB	SB
Directions Served	L	R	L	T	T	TR
Maximum Queue (m)	85.1	57.8	19.5	82.0	59.4	4.6
Average Queue (m)	39.0	19.8	6.3	19.8	7.8	0.2
95th Queue (m)	90.2	61.8	16.9	80.4	46.2	2.7
Link Distance (m)	102.1	102.1		206.3	206.3	137.8
Upstream Blk Time (%)	7	6				
Queuing Penalty (veh)	0	0				
Storage Bay Dist (m)			15.0			
Storage Blk Time (%)			1	11		
Queuing Penalty (veh)			5	5		

Intersection: 31: Bayview Drive & Medical Centre North D/W

Movement	EB	NB	NB	NB	SB
Directions Served	LR	L	T	T	T
Maximum Queue (m)	103.4	17.0	144.5	139.8	2.3
Average Queue (m)	72.8	1.9	83.7	67.7	0.1
95th Queue (m)	139.5	10.0	172.1	161.9	1.6
Link Distance (m)	108.5		137.8	137.8	92.4
Upstream Blk Time (%)	43		8	1	
Queuing Penalty (veh)	0		46	9	
Storage Bay Dist (m)		15.0			
Storage Blk Time (%)		0	48		
Queuing Penalty (veh)		0	5		

Intersection: 33: Bayview Drive & Big Bay Point Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	TR	L
Maximum Queue (m)	75.0	234.6	225.1	75.0	93.6	139.6	129.4	65.8	92.3	112.6	103.9	75.2
Average Queue (m)	67.2	134.2	128.5	57.4	55.6	64.0	53.2	18.7	88.2	98.9	79.1	40.7
95th Queue (m)	91.2	256.7	248.6	99.4	94.0	116.8	96.7	43.5	104.5	118.7	119.1	71.5
Link Distance (m)		835.5	835.5			287.9	287.9			92.4	92.4	
Upstream Blk Time (%)									19	42	17	
Queuing Penalty (veh)									0	252	100	
Storage Bay Dist (m)	25.0			25.0	40.0			25.0	100.0			40.0
Storage Blk Time (%)	57	59	62	6	35	21	33	1	19	42		22
Queuing Penalty (veh)	244	128	137	27	104	62	76	2	52	181		41

Intersection: 33: Bayview Drive & Big Bay Point Road

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (m)	77.2	64.1	62.6
Average Queue (m)	39.8	35.5	27.7
95th Queue (m)	62.4	55.4	51.1
Link Distance (m)	101.3	101.3	
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (m)			50.0
Storage Blk Time (%)	10	2	1
Queuing Penalty (veh)	18	4	2

Intersection: 37: Bend

Movement	NB
Directions Served	T
Maximum Queue (m)	44.0
Average Queue (m)	1.5
95th Queue (m)	22.3
Link Distance (m)	101.3
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 39: Bryne Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	B42
Directions Served	L	T	T	TR	L	T	T	TR	L	T	TR	T
Maximum Queue (m)	60.7	85.8	95.2	83.6	54.6	59.8	31.4	22.2	41.2	39.3	95.7	9.1
Average Queue (m)	20.2	49.7	60.3	49.2	32.4	8.0	7.2	4.8	17.1	18.6	40.1	0.3
95th Queue (m)	43.8	80.0	88.9	80.6	53.3	29.0	20.5	15.1	33.7	34.2	72.9	6.4
Link Distance (m)		286.6	286.6	286.6		65.4	65.4	65.4		97.4	97.4	42.8
Upstream Blk Time (%)						1	0				1	0
Queuing Penalty (veh)						4	0				0	0
Storage Bay Dist (m)	60.0				50.0				45.0			
Storage Blk Time (%)	0	3			3	0			0	0		
Queuing Penalty (veh)	0	3			13	0			0	0		

Intersection: 39: Bryne Drive & Mapleview Drive W

Movement	SB	SB	SB
Directions Served	L	T	TR
Maximum Queue (m)	29.5	22.3	13.0
Average Queue (m)	11.2	6.5	4.6
95th Queue (m)	24.0	17.7	11.8
Link Distance (m)		172.2	172.2
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)	50.0		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 43: Bryne Road & Harvie Road/Big Bay Point Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	R
Maximum Queue (m)	24.4	106.0	94.4	7.2	80.0	236.6	236.6	44.0	27.4	52.6	45.1	49.5
Average Queue (m)	2.3	68.8	59.9	0.7	72.0	132.9	122.5	10.0	12.4	33.3	19.6	24.4
95th Queue (m)	14.3	98.1	87.5	4.6	96.8	255.0	240.6	26.1	24.6	49.2	38.0	45.1
Link Distance (m)		266.9	266.9			835.5	835.5			283.7	283.7	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	60.0			60.0	60.0			60.0	60.0			60.0
Storage Blk Time (%)		14	6		76	1	3			0		0
Queuing Penalty (veh)		1	0		326	1	4			0		0

Intersection: 43: Bryne Road & Harvie Road/Big Bay Point Road

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (m)	80.0	166.0	147.1	62.3
Average Queue (m)	79.7	152.3	89.6	13.6
95th Queue (m)	83.5	181.2	168.3	34.8
Link Distance (m)		149.6	149.6	
Upstream Blk Time (%)		90	0	
Queuing Penalty (veh)		0	0	
Storage Bay Dist (m)	60.0			60.0
Storage Blk Time (%)	92	0	2	
Queuing Penalty (veh)	168	0	2	

Network Summary

Network wide Queuing Penalty: 3591

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	683	2133	1906	1061	495	573
v/c Ratio	0.90	0.61	0.84	0.67	0.69	0.93
Control Delay	41.1	12.3	20.5	5.8	53.0	67.4
Queue Delay	0.0	2.9	0.0	0.0	0.4	0.0
Total Delay	41.1	15.1	20.5	5.8	53.4	67.4
Queue Length 50th (m)	71.1	171.5	78.8	41.1	63.6	78.2
Queue Length 95th (m)	m#96.6	183.7	m76.8	m40.2	83.0	#115.1
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	792	3517	2270	1583	739	634
Starvation Cap Reductn	0	1238	0	0	0	0
Spillback Cap Reductn	0	0	11	0	40	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.94	0.84	0.67	0.71	0.90

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)	683	2133	0	0	1906	1061	495	0	573	0	0	0
Future Volume (vph)	683	2133	0	0	1906	1061	495	0	573	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0			6.0	4.0	6.0		6.0			
Lane Util. Factor	0.97	0.91			0.91	1.00	0.97		0.88			
Frpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00			
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)	3433	5036			5085	1583	3433		2733			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3433	5036			5085	1583	3433		2733			
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)	683	2133	0	0	1906	1061	495	0	573	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	47	0	0	0
Lane Group Flow (vph)	683	2133	0	0	1906	1061	495	0	526	0	0	0
Confl. Peds. (#/hr)			3	3								
Heavy Vehicles (%)	2%	3%	0%	0%	2%	2%	2%	0%	4%	0%	0%	0%
Turn Type	Prot	NA			NA	Free	Prot		Perm			
Protected Phases	5	2			6		8					
Permitted Phases						Free			8			
Actuated Green, G (s)	28.8	90.8			58.0	130.0	27.2		27.2			
Effective Green, g (s)	28.8	90.8			58.0	130.0	27.2		27.2			
Actuated g/C Ratio	0.22	0.70			0.45	1.00	0.21		0.21			
Clearance Time (s)	4.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)	760	3517			2268	1583	718		571			
v/s Ratio Prot	c0.20	0.42			c0.37		0.14					
v/s Ratio Perm						0.67			c0.19			
v/c Ratio	0.90	0.61			0.84	0.67	0.69		0.92			
Uniform Delay, d1	49.2	10.3			31.9	0.0	47.5		50.4			
Progression Factor	0.64	1.13			0.60	1.00	1.00		1.00			
Incremental Delay, d2	7.6	0.4			1.0	0.6	2.8		20.5			
Delay (s)	39.2	12.0			20.0	0.6	50.3		70.8			
Level of Service	D	B			C	A	D		E			
Approach Delay (s)		18.6			13.1			61.3			0.0	
Approach LOS		B			B			E			A	

Intersection Summary

HCM 2000 Control Delay	22.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	89.6%	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	SBR
Lane Group Flow (vph)	417	1900	70	72	1784	256	693	91	227	50	492
v/c Ratio	0.91	0.94	0.10	0.45	1.11	0.42	0.85	0.21	0.86	0.18	0.86
Control Delay	82.1	28.8	0.5	26.2	84.0	6.2	58.3	33.6	83.6	50.3	51.4
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.1	28.8	0.5	26.2	84.2	6.2	58.3	33.6	83.6	50.3	51.4
Queue Length 50th (m)	~64.4	~203.4	0.3	7.0	~195.6	4.6	91.4	16.3	59.6	11.8	109.3
Queue Length 95th (m)	m#94.9	#235.2	m0.9	m7.9	m#224.7	m6.3	112.9	31.1	#105.9	24.6	#179.8
Internal Link Dist (m)		225.6			141.6			127.2		94.6	
Turn Bay Length (m)	160.0		175.0	50.0			50.0		60.0		
Base Capacity (vph)	458	2027	711	163	1607	607	893	471	271	286	572
Starvation Cap Reductn	0	0	0	0	49	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	0.91	0.94	0.10	0.44	1.15	0.42	0.78	0.19	0.84	0.17	0.86

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)	417	1900	70	72	1784	256	693	65	26	227	50	492
Future Volume (vph)	417	1900	70	72	1784	256	693	65	26	227	50	492
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		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)	3502	4940	1578	1787	5036	1529	3467	1786		1805	1900	1615
Flt Permitted	0.95	1.00	1.00	0.10	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	4940	1578	181	5036	1529	3467	1786		1805	1900	1615
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)	417	1900	70	72	1784	256	693	65	26	227	50	492
RTOR Reduction (vph)	0	0	42	0	0	119	0	11	0	0	0	55
Lane Group Flow (vph)	417	1900	28	72	1784	137	693	80	0	227	50	437
Confl. Peds. (#/hr)	3		1	1		3			2	2		
Heavy Vehicles (%)	0%	5%	1%	1%	3%	4%	1%	2%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases			2	6		6						4
Actuated Green, G (s)	17.0	52.5	52.5	47.5	41.5	41.5	30.5	30.5		19.0	19.0	36.0
Effective Green, g (s)	17.0	52.5	52.5	47.5	41.5	41.5	30.5	30.5		19.0	19.0	36.0
Actuated g/C Ratio	0.13	0.40	0.40	0.37	0.32	0.32	0.23	0.23		0.15	0.15	0.28
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0
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	1995	637	140	1607	488	813	419		263	277	447
v/s Ratio Prot	0.12	0.38		0.02	c0.35		c0.20	0.04		0.13	0.03	c0.13
v/s Ratio Perm			0.02	0.16		0.09						0.14
v/c Ratio	0.91	0.95	0.04	0.51	1.11	0.28	0.85	0.19		0.86	0.18	0.98
Uniform Delay, d1	55.8	37.5	23.5	31.6	44.2	33.1	47.6	39.9		54.2	48.7	46.6
Progression Factor	1.13	0.50	0.26	1.16	0.70	0.47	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	20.0	9.3	0.1	1.2	53.5	0.5	8.6	0.2		24.1	0.3	36.4
Delay (s)	83.2	28.1	6.1	37.8	84.3	16.2	56.2	40.1		78.3	49.0	83.0
Level of Service	F	C	A	D	F	B	E	D		E	D	F
Approach Delay (s)		37.1			74.5			54.3			79.4	
Approach LOS		D			E			D			E	

Intersection Summary

HCM 2000 Control Delay	57.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	98.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (m)	89.1	103.0	162.0	111.4	112.1	137.4	97.0	85.3	80.7	82.5	84.6	116.8
Average Queue (m)	49.3	48.6	38.9	23.8	26.2	81.7	52.0	52.1	44.7	49.7	51.3	68.1
95th Queue (m)	81.7	87.4	117.5	79.3	74.8	125.5	82.4	75.2	76.5	74.9	77.0	104.0
Link Distance (m)		168.4	168.4	168.4	168.4	218.3	218.3	218.3			335.8	335.8
Upstream Blk Time (%)			1	0								
Queuing Penalty (veh)			7	0								
Storage Bay Dist (m)	130.0								130.0	265.0		
Storage Blk Time (%)		0										
Queuing Penalty (veh)		0										

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	NB
Directions Served	R
Maximum Queue (m)	109.1
Average Queue (m)	54.5
95th Queue (m)	92.9
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	265.0
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	L
Maximum Queue (m)	137.8	162.6	203.0	135.9	140.6	13.3	57.2	131.2	129.6	143.8	163.7	57.4
Average Queue (m)	94.7	101.1	97.3	62.8	69.9	4.2	17.3	68.6	88.3	110.3	71.6	54.8
95th Queue (m)	177.7	188.2	195.5	115.9	123.8	11.1	42.2	120.9	146.4	160.5	185.1	66.5
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)			3					0	0	4	5	
Queuing Penalty (veh)			24					1	1	23	29	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)	7	11	1		0			19				13
Queuing Penalty (veh)	47	72	5		0			13				44

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R
Maximum Queue (m)	142.2	135.7	66.6	100.0	100.6
Average Queue (m)	133.7	90.3	53.6	54.4	96.8
95th Queue (m)	138.2	181.7	76.9	125.7	112.5
Link Distance (m)	128.7	128.7		96.0	96.0
Upstream Blk Time (%)	75	21		17	63
Queuing Penalty (veh)	0	0		0	0
Storage Bay Dist (m)			60.0		
Storage Blk Time (%)	69		31	0	
Queuing Penalty (veh)	240		15	0	

Zone Summary

Zone wide Queuing Penalty: 520

HCM Signalized Intersection Capacity Analysis
1: West Terminal

07-05-2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	1933	0	0	2139	0	0	0	0
Future Volume (vph)	0	0	0	0	1933	0	0	2139	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0			6.0				
Lane Util. Factor					0.91			0.91				
Frt					1.00			1.00				
Flt Protected					1.00			1.00				
Satd. Flow (prot)					5193			5142				
Flt Permitted					1.00			1.00				
Satd. Flow (perm)					5193			5142				
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	0	1933	0	0	2139	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1933	0	0	2139	0	0	0	0
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	2%	0%	0%	0%	0%
Turn Type					NA			NA				
Protected Phases					6			8				
Permitted Phases												
Actuated Green, G (s)					56.2			61.8				
Effective Green, g (s)					56.2			61.8				
Actuated g/C Ratio					0.43			0.48				
Clearance Time (s)					6.0			6.0				
Vehicle Extension (s)					3.0			3.0				
Lane Grp Cap (vph)					2244			2444				
v/s Ratio Prot					c0.37			c0.42				
v/s Ratio Perm												
v/c Ratio					0.86			0.88				
Uniform Delay, d1					33.4			30.6				
Progression Factor					0.69			1.00				
Incremental Delay, d2					3.1			3.8				
Delay (s)					26.1			34.5				
Level of Service					C			C				
Approach Delay (s)		0.0			26.1			34.5			0.0	
Approach LOS		A			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
2: W-N & N-E

07-05-2022

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2139	0	0	677	0
Future Volume (vph)	0	2139	0	0	677	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	
Lane Util. Factor		0.91			0.97	
Frt		1.00			1.00	
Flt Protected		1.00			0.95	
Satd. Flow (prot)		5142			3404	
Flt Permitted		1.00			0.95	
Satd. Flow (perm)		5142			3404	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2139	0	0	677	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	2139	0	0	677	0
Heavy Vehicles (%)	0%	2%	0%	0%	4%	0%
Turn Type		NA			Prot	
Protected Phases		4			6	
Permitted Phases						
Actuated Green, G (s)		62.0			56.0	
Effective Green, g (s)		62.0			56.0	
Actuated g/C Ratio		0.48			0.43	
Clearance Time (s)		6.0			6.0	
Vehicle Extension (s)		3.0			3.0	
Lane Grp Cap (vph)		2452			1466	
v/s Ratio Prot		c0.42			c0.20	
v/s Ratio Perm						
v/c Ratio		0.87			0.46	
Uniform Delay, d1		30.5			26.3	
Progression Factor		0.00			1.00	
Incremental Delay, d2		2.2			1.0	
Delay (s)		2.3			27.3	
Level of Service		A			C	
Approach Delay (s)		2.3	0.0		27.3	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: East Terminal

07-05-2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	2133	0	0	0	0	0	0	0	0	1906	0
Future Volume (vph)	0	2133	0	0	0	0	0	0	0	0	1906	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0									6.0	
Lane Util. Factor		0.91									0.91	
Frt		1.00									1.00	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		5092									5142	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		5092									5142	
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	2133	0	0	0	0	0	0	0	0	1906	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2133	0	0	0	0	0	0	0	0	1906	0
Heavy Vehicles (%)	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%
Turn Type		NA									NA	
Protected Phases		4									2	
Permitted Phases												
Actuated Green, G (s)		60.8									57.2	
Effective Green, g (s)		60.8									57.2	
Actuated g/C Ratio		0.47									0.44	
Clearance Time (s)		6.0									6.0	
Vehicle Extension (s)		3.0									3.0	
Lane Grp Cap (vph)		2381									2262	
v/s Ratio Prot		c0.42									c0.37	
v/s Ratio Perm												
v/c Ratio		0.90									0.84	
Uniform Delay, d1		31.7									32.4	
Progression Factor		0.70									1.00	
Incremental Delay, d2		3.3									4.0	
Delay (s)		25.4									36.4	
Level of Service		C									D	
Approach Delay (s)		25.4			0.0			0.0			36.4	
Approach LOS		C			A			A			D	

Intersection Summary				
HCM 2000 Control Delay	30.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	88.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
4: West Terminal/E-S

07-05-2022

Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Traffic Volume (veh/h)	0	0	468	1933	0	0
Future Volume (Veh/h)	0	0	468	1933	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	468	1933	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	67			77		
pX, platoon unblocked					0.66	
vC, conflicting volume			0		1580	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		90	0
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			71		100	100
cM capacity (veh/h)			1607		425	1091

Direction, Lane #	WB 1	WB 2	WB 3
Volume Total	855	773	773
Volume Left	468	0	0
Volume Right	0	0	0
cSH	1607	1700	1700
Volume to Capacity	0.29	0.45	0.45
Queue Length 95th (m)	9.3	0.0	0.0
Control Delay (s)	5.9	0.0	0.0
Lane LOS	A		
Approach Delay (s)	2.1		
Approach LOS			

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: W-S

07-05-2022

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	2139	189	0	0	0	0
Future Volume (Veh/h)	2139	189	0	0	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	2139	189	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				51		
pX, platoon unblocked						
vC, conflicting volume			2328		2139	713
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2328		2139	713
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			216		43	379

Direction, Lane #	EB 1	EB 2	EB 3	EB 4
Volume Total	713	713	713	189
Volume Left	0	0	0	0
Volume Right	0	0	0	189
cSH	1700	1700	1700	1700
Volume to Capacity	0.42	0.42	0.42	0.11
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0			
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	87.0%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
7: N-W

07-05-2022

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	1933	0	0	278
Future Volume (vph)	0	0	1933	0	0	278
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			6.0			6.0
Lane Util. Factor			0.91			0.88
Frt			1.00			0.85
Flt Protected			1.00			1.00
Satd. Flow (prot)			5193			2763
Flt Permitted			1.00			1.00
Satd. Flow (perm)			5193			2763
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	1933	0	0	278
RTOR Reduction (vph)	0	0	0	0	0	2
Lane Group Flow (vph)	0	0	1933	0	0	276
Heavy Vehicles (%)	0%	0%	1%	0%	0%	4%
Turn Type			NA			Prot
Protected Phases			2			8
Permitted Phases						
Actuated Green, G (s)			56.0			62.0
Effective Green, g (s)			56.0			62.0
Actuated g/C Ratio			0.43			0.48
Clearance Time (s)			6.0			6.0
Lane Grp Cap (vph)			2236			1317
v/s Ratio Prot			c0.37			c0.10
v/s Ratio Perm						
v/c Ratio			0.86			0.21
Uniform Delay, d1			33.6			19.8
Progression Factor			0.00			1.00
Incremental Delay, d2			2.4			0.4
Delay (s)			2.5			20.1
Level of Service			A			C
Approach Delay (s)		0.0	2.5		20.1	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	4.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
12: E-N

07-05-2022

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (veh/h)	0	0	1906	1061	0	0
Future Volume (Veh/h)	0	0	1906	1061	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	1906	1061	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		32				
pX, platoon unblocked						
vC, conflicting volume	2967				1906	635
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2967				1906	635
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	121				62	426

Direction, Lane #	WB 1	WB 2	WB 3	WB 4
Volume Total	635	635	635	1061
Volume Left	0	0	0	0
Volume Right	0	0	0	1061
cSH	1700	1700	1700	1700
Volume to Capacity	0.37	0.37	0.37	0.62
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0			
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	88.0%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
14: S-E

07-05-2022

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2133	0	0	0	0	573
Future Volume (vph)	2133	0	0	0	0	573
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0					6.0
Lane Util. Factor	0.91					0.88
Frt	1.00					0.85
Flt Protected	1.00					1.00
Satd. Flow (prot)	5092					2763
Flt Permitted	1.00					1.00
Satd. Flow (perm)	5092					2763
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	2133	0	0	0	0	573
RTOR Reduction (vph)	0	0	0	0	0	2
Lane Group Flow (vph)	2133	0	0	0	0	571
Heavy Vehicles (%)	3%	0%	0%	0%	0%	4%
Turn Type	NA					Perm
Protected Phases	4					
Permitted Phases						2
Actuated Green, G (s)	62.0					56.0
Effective Green, g (s)	62.0					56.0
Actuated g/C Ratio	0.48					0.43
Clearance Time (s)	6.0					6.0
Lane Grp Cap (vph)	2428					1190
v/s Ratio Prot	c0.42					
v/s Ratio Perm						c0.21
v/c Ratio	0.88					0.48
Uniform Delay, d1	30.6					26.5
Progression Factor	0.00					1.00
Incremental Delay, d2	2.3					1.4
Delay (s)	2.3					27.9
Level of Service	A					C
Approach Delay (s)	2.3			0.0	27.9	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	7.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
16: W-N/East Terminal

07-05-2022

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Traffic Volume (veh/h)	683	2133	0	0	0	0
Future Volume (Veh/h)	683	2133	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	683	2133	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		75	74			
pX, platoon unblocked					0.63	
vC, conflicting volume	0				2077	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				647	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	58				100	100
cM capacity (veh/h)	1622				149	1091

Direction, Lane #	EB 1	EB 2	EB 3
Volume Total	1110	853	853
Volume Left	683	0	0
Volume Right	0	0	0
cSH	1622	1700	1700
Volume to Capacity	0.42	0.50	0.50
Queue Length 95th (m)	16.3	0.0	0.0
Control Delay (s)	7.3	0.0	0.0
Lane LOS	A		
Approach Delay (s)	2.9		
Approach LOS			

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	127.4%	ICU Level of Service	H
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
17: S-W & E-S

07-05-2022

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1906	495	0
Future Volume (vph)	0	0	0	1906	495	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.0	6.0	
Lane Util. Factor				0.91	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				5142	3471	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				5142	3471	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	1906	495	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	1906	495	0
Heavy Vehicles (%)	0%	0%	0%	2%	2%	0%
Turn Type				NA	Prot	
Protected Phases				8	2	
Permitted Phases						
Actuated Green, G (s)				56.0	62.0	
Effective Green, g (s)				56.0	62.0	
Actuated g/C Ratio				0.43	0.48	
Clearance Time (s)				6.0	6.0	
Vehicle Extension (s)				3.0	3.0	
Lane Grp Cap (vph)				2215	1655	
v/s Ratio Prot				c0.37	c0.14	
v/s Ratio Perm						
v/c Ratio				0.86	0.30	
Uniform Delay, d1				33.5	20.7	
Progression Factor				0.03	1.00	
Incremental Delay, d2				2.5	0.5	
Delay (s)				3.3	21.2	
Level of Service				A	C	
Approach Delay (s)	0.0			3.3	21.2	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 1: West Terminal

Movement	WB	WB	WB	NE	NE	NE
Directions Served	T	T	T	T	T	T
Maximum Queue (m)	52.2	48.6	51.1	33.0	42.3	41.6
Average Queue (m)	42.1	45.8	45.4	29.9	29.3	30.4
95th Queue (m)	51.3	47.1	47.8	31.9	37.2	36.9
Link Distance (m)	18.6	18.6	18.6	25.6	25.6	25.6
Upstream Blk Time (%)	48	59	59	57	39	48
Queuing Penalty (veh)	307	378	380	404	281	341
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: W-N & N-E

Movement	EB	EB	EB	SB	SB
Directions Served	T	T	T	L	L
Maximum Queue (m)	34.0	36.2	28.4	67.6	61.0
Average Queue (m)	23.0	10.7	13.5	55.9	41.5
95th Queue (m)	34.3	27.4	27.3	66.5	57.1
Link Distance (m)	22.8	22.8	22.8	37.0	37.0
Upstream Blk Time (%)	7	5	10	28	11
Queuing Penalty (veh)	49	39	71	96	39
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: East Terminal

Movement	EB	EB	EB	SW	SW	SW
Directions Served	T	T	T	T	T	T
Maximum Queue (m)	70.1	69.2	64.2	45.0	43.2	43.3
Average Queue (m)	59.4	58.1	55.4	36.9	36.6	36.9
95th Queue (m)	65.4	64.5	64.3	41.6	39.1	41.7
Link Distance (m)	27.3	27.3	27.3	19.8	19.8	19.8
Upstream Blk Time (%)	41	46	49	67	63	52
Queuing Penalty (veh)	291	325	348	425	399	332
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: West Terminal/E-S

Movement	WB	WB	WB
Directions Served	LT	T	T
Maximum Queue (m)	74.0	77.3	78.3
Average Queue (m)	61.9	59.9	56.9
95th Queue (m)	74.4	79.1	80.6
Link Distance (m)	59.5	59.5	59.5
Upstream Blk Time (%)	30	21	18
Queuing Penalty (veh)	243	170	147
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: W-S

Movement	EB	EB	EB	EB
Directions Served	T	T	T	R
Maximum Queue (m)	191.1	191.2	186.4	187.5
Average Queue (m)	183.0	181.6	167.2	98.1
95th Queue (m)	187.9	191.9	206.3	243.4
Link Distance (m)	176.8	176.8	176.8	176.8
Upstream Blk Time (%)	84	68	14	8
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: N-W

Movement	WB	WB	WB	SB	SB
Directions Served	T	T	T	R	R
Maximum Queue (m)	11.2	21.6	22.9	57.0	36.9
Average Queue (m)	2.0	12.8	13.5	28.6	16.0
95th Queue (m)	8.0	20.7	21.2	49.1	36.7
Link Distance (m)	7.7	7.7	7.7	37.4	37.4
Upstream Blk Time (%)	9	51	52	3	0
Queuing Penalty (veh)	55	326	336	4	0
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 12: E-N

Movement	WB	WB	WB	WB
Directions Served	T	T	T	R
Maximum Queue (m)	201.0	196.4	184.2	119.1
Average Queue (m)	182.4	167.3	132.1	64.6
95th Queue (m)	214.5	212.5	212.3	213.3
Link Distance (m)	187.5	187.5	187.5	187.5
Upstream Blk Time (%)	26	14	9	7
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 14: S-E

Movement	EB	EB	EB	NB	NB
Directions Served	T	T	T	R	R
Maximum Queue (m)	6.0	9.5	21.8	72.2	52.6
Average Queue (m)	0.5	1.5	9.4	53.3	40.2
95th Queue (m)	3.3	6.5	18.0	73.1	58.2
Link Distance (m)	20.9	20.9	20.9	48.7	48.7
Upstream Blk Time (%)		0	2	11	1
Queuing Penalty (veh)		0	14	33	4
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 16: W-N/East Terminal

Movement	EB	EB	EB
Directions Served	LT	T	T
Maximum Queue (m)	74.8	78.2	78.4
Average Queue (m)	50.3	41.7	33.6
95th Queue (m)	76.6	76.6	73.5
Link Distance (m)	54.6	54.6	54.6
Upstream Blk Time (%)	7	3	2
Queuing Penalty (veh)	63	25	23
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 17: S-W & E-S

Movement	WB	WB	WB	NB	NB
Directions Served	T	T	T	L	L
Maximum Queue (m)	39.3	39.8	40.5	67.5	64.8
Average Queue (m)	23.8	25.2	22.6	56.7	42.8
95th Queue (m)	38.1	39.8	42.0	69.6	64.1
Link Distance (m)	31.8	31.8	31.8	39.6	39.6
Upstream Blk Time (%)	2	2	2	53	20
Queuing Penalty (veh)	12	15	12	131	50
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 6165

Appendix I

2036 Total Synchro Analysis

Queues
210498

3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W
2036 Future Total - AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	28	1287	383	2089	5	4	160	262	38
v/c Ratio	0.16	0.45	0.70	0.70	0.03	0.03	0.59	0.78	0.05
Control Delay	6.9	4.4	59.7	7.8	31.4	47.8	13.6	54.3	29.6
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	6.9	4.4	59.7	7.9	31.4	47.8	13.6	54.3	29.6
Queue Length 50th (m)	0.4	7.7	45.2	54.7	0.9	0.9	0.0	53.7	2.7
Queue Length 95th (m)	m0.7	9.5	m59.7	81.7	3.8	4.4	13.7	#78.3	7.8
Internal Link Dist (m)		85.3		118.2		85.0			175.8
Turn Bay Length (m)	70.0		65.0		20.0			40.0	
Base Capacity (vph)	176	2861	598	2982	193	310	412	336	837
Starvation Cap Reductn	0	0	0	183	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	0.16	0.45	0.64	0.75	0.03	0.01	0.39	0.78	0.05

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
210498

3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W
2036 Future Total - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	1280	7	383	1746	343	5	4	160	262	29	9
Future Volume (vph)	28	1280	7	383	1746	343	5	4	160	262	29	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0	6.0	4.0	6.0	
Lane Util. Factor	1.00	0.86		0.97	0.91		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.99	1.00	
Frt	1.00	1.00		1.00	0.98		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	6048		3467	4860		1733	1900	1560	1742	3462	
Flt Permitted	0.08	1.00		0.95	1.00		0.73	1.00	1.00	0.54	1.00	
Satd. Flow (perm)	156	6048		3467	4860		1334	1900	1560	986	3462	
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)	28	1280	7	383	1746	343	5	4	160	262	29	9
RTOR Reduction (vph)	0	1	0	0	22	0	0	0	146	0	7	0
Lane Group Flow (vph)	28	1286	0	383	2067	0	5	4	14	262	31	0
Confl. Peds. (#/hr)	2					2	1		7	7		1
Heavy Vehicles (%)	0%	8%	3%	1%	4%	3%	4%	0%	1%	3%	0%	1%
Turn Type	pm+pt	NA		Prot	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2						8		8	4		
Actuated Green, G (s)	52.6	48.8		17.3	62.3		11.0	9.9	9.9	27.9	22.8	
Effective Green, g (s)	52.6	48.8		17.3	62.3		11.0	9.9	9.9	27.9	22.8	
Actuated g/C Ratio	0.48	0.44		0.16	0.57		0.10	0.09	0.09	0.25	0.21	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0	6.0	4.0	6.0	
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)	131	2683		545	2752		137	171	140	346	717	
v/s Ratio Prot	0.01	0.21		c0.11	c0.43		0.00	0.00		c0.10	0.01	
v/s Ratio Perm	0.09						0.00		0.01	c0.10		
v/c Ratio	0.21	0.48		0.70	0.75		0.04	0.02	0.10	0.76	0.04	
Uniform Delay, d1	16.5	21.6		43.9	18.0		44.7	45.6	46.0	36.3	34.9	
Progression Factor	0.67	0.20		1.24	0.43		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	0.5		3.1	1.5		0.1	0.1	0.3	9.1	0.0	
Delay (s)	11.7	4.8		57.6	9.2		44.8	45.7	46.3	45.4	34.9	
Level of Service	B	A		E	A		D	D	D	D	C	
Approach Delay (s)		4.9			16.7			46.2			44.1	
Approach LOS		A			B			D			D	

Intersection Summary

HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	80.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	1503	198	444	1749	674	723
v/c Ratio	0.77	0.34	0.95	0.59	0.69	0.86
Control Delay	24.3	4.1	46.6	9.8	38.3	44.2
Queue Delay	0.0	0.0	0.0	0.3	0.0	0.0
Total Delay	24.3	4.1	46.6	10.1	38.3	44.2
Queue Length 50th (m)	98.4	5.1	70.4	93.6	67.4	77.7
Queue Length 95th (m)	#96.4	m6.1	#140.0	126.0	86.5	103.1
Internal Link Dist (m)	118.2			168.8		
Turn Bay Length (m)		45.0	135.0		300.0	300.0
Base Capacity (vph)	1962	576	506	2966	1071	916
Starvation Cap Reductn	0	0	0	499	0	0
Spillback Cap Reductn	0	0	0	88	0	1
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.34	0.88	0.71	0.63	0.79

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)	0	1503	198	444	1749	0	0	0	0	674	0	723
Future Volume (vph)	0	1503	198	444	1749	0	0	0	0	674	0	723
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	4.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	1.00	0.91					0.97		0.88
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		6225	1538	1626	4940					3367		2733
Flt Permitted		1.00	1.00	0.10	1.00					0.95		1.00
Satd. Flow (perm)		6225	1538	177	4940					3367		2733
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	1503	198	444	1749	0	0	0	0	674	0	723
RTOR Reduction (vph)	0	0	91	0	0	0	0	0	0	0	0	49
Lane Group Flow (vph)	0	1503	107	444	1749	0	0	0	0	674	0	674
Heavy Vehicles (%)	0%	5%	5%	11%	5%	0%	0%	0%	0%	4%	0%	4%
Turn Type		NA	Perm	pm+pt	NA					Prot		Perm
Protected Phases		2		1	6					4		
Permitted Phases			2	6								4
Actuated Green, G (s)		34.7	34.7	66.1	66.1					31.9		31.9
Effective Green, g (s)		34.7	34.7	66.1	66.1					31.9		31.9
Actuated g/C Ratio		0.32	0.32	0.60	0.60					0.29		0.29
Clearance Time (s)		6.0	6.0	4.0	6.0					6.0		6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		3.0
Lane Grp Cap (vph)		1963	485	467	2968					976		792
v/s Ratio Prot		0.24		c0.24	0.35					0.20		
v/s Ratio Perm			0.07	c0.33								c0.25
v/c Ratio		0.77	0.22	0.95	0.59					0.69		0.85
Uniform Delay, d1		34.0	27.7	31.4	13.6					34.7		36.8
Progression Factor		0.59	0.23	0.69	0.65					1.00		1.00
Incremental Delay, d2		2.6	0.9	24.5	0.7					2.1		8.7
Delay (s)		22.8	7.2	46.3	9.4					36.8		45.5
Level of Service		C	A	D	A					D		D
Approach Delay (s)		21.0			16.9			0.0			41.3	
Approach LOS		C			B			A			D	

Intersection Summary

HCM 2000 Control Delay	24.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	314	1863	1729	772	464	240
v/c Ratio	0.70	0.53	0.68	0.70	0.74	0.44
Control Delay	38.8	8.4	10.9	7.0	49.0	29.2
Queue Delay	0.0	0.4	0.0	1.1	0.0	0.0
Total Delay	38.8	8.8	10.9	8.1	49.0	29.2
Queue Length 50th (m)	23.6	113.6	35.3	17.1	51.4	19.2
Queue Length 95th (m)	m35.9	130.7	m43.9	m26.0	65.0	30.7
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	483	3514	2556	1108	825	703
Starvation Cap Reductn	0	939	0	146	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	0.72	0.68	0.80	0.56	0.34

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)	314	1863	0	0	1729	772	464	0	240	0	0	0
Future Volume (vph)	314	1863	0	0	1729	772	464	0	240	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0			6.0	6.0	6.0		6.0			
Lane Util. Factor	0.97	0.91			0.91	1.00	0.97		0.88			
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)	3213	5036			4893	1468	3242		2561			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3213	5036			4893	1468	3242		2561			
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	1863	0	0	1729	772	464	0	240	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	342	0	0	56	0	0	0
Lane Group Flow (vph)	314	1863	0	0	1729	430	464	0	184	0	0	0
Heavy Vehicles (%)	9%	3%	0%	0%	6%	10%	8%	0%	11%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Prot		Perm			
Protected Phases	5	2			6		8					
Permitted Phases						6			8			
Actuated Green, G (s)	15.3	76.8			57.5	57.5	21.2		21.2			
Effective Green, g (s)	15.3	76.8			57.5	57.5	21.2		21.2			
Actuated g/C Ratio	0.14	0.70			0.52	0.52	0.19		0.19			
Clearance Time (s)	4.0	6.0			6.0	6.0	6.0		6.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0			
Lane Grp Cap (vph)	446	3516			2557	767	624		493			
v/s Ratio Prot	c0.10	0.37			c0.35		c0.14					
v/s Ratio Perm						0.29			0.07			
v/c Ratio	0.70	0.53			0.68	0.56	0.74		0.37			
Uniform Delay, d1	45.2	8.0			19.4	17.7	41.8		38.6			
Progression Factor	0.72	0.94			0.50	2.10	1.00		1.00			
Incremental Delay, d2	3.4	0.4			0.6	1.3	4.8		0.5			
Delay (s)	36.2	7.9			10.3	38.6	46.6		39.1			
Level of Service	D	A			B	D	D		D			
Approach Delay (s)		12.0			19.0			44.1			0.0	
Approach LOS		B			B			D			A	

Intersection Summary

HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	83.3%	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)	327	1566	30	13	2109	96	180	40	43	10	215
v/c Ratio	0.60	0.51	0.03	0.05	0.97	0.13	0.50	0.20	0.29	0.06	0.66
Control Delay	68.5	2.6	0.1	4.0	19.2	0.1	51.2	23.7	51.2	45.3	17.1
Queue Delay	0.0	0.0	0.0	0.0	42.6	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.5	2.6	0.1	4.0	61.8	0.1	51.2	23.7	51.2	45.3	17.1
Queue Length 50th (m)	39.4	14.4	0.0	0.4	73.6	0.1	20.2	2.5	9.4	2.2	0.9
Queue Length 95th (m)	#72.3	20.3	m0.0	m0.6	m96.9	m0.0	30.7	12.9	20.1	7.4	23.2
Internal Link Dist (m)		225.6			141.6			127.2		94.6	
Turn Bay Length (m)	160.0		175.0	50.0			50.0		60.0		
Base Capacity (vph)	547	3077	976	257	2181	734	835	427	149	157	326
Starvation Cap Reductn	0	0	0	0	301	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	0.51	0.03	0.05	1.12	0.13	0.22	0.09	0.29	0.06	0.66

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)	327	1566	30	13	2109	96	180	12	28	43	10	215
Future Volume (vph)	327	1566	30	13	2109	96	180	12	28	43	10	215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90		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)	3367	4893	1476	1805	4848	1475	3467	1685		1805	1900	1599
Flt Permitted	0.95	1.00	1.00	0.15	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3367	4893	1476	287	4848	1475	3467	1685		1805	1900	1599
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)	327	1566	30	13	2109	96	180	12	28	43	10	215
RTOR Reduction (vph)	0	0	12	0	0	53	0	25	0	0	0	194
Lane Group Flow (vph)	327	1566	18	13	2109	43	180	15	0	43	10	21
Confl. Peds. (#/hr)	2		1	1		2			1	1		
Heavy Vehicles (%)	4%	6%	8%	0%	7%	8%	1%	0%	0%	0%	0%	1%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2	6		6						4
Actuated Green, G (s)	17.9	66.0	66.0	50.9	49.5	49.5	11.5	11.5		9.1	9.1	9.1
Effective Green, g (s)	17.9	66.0	66.0	50.9	49.5	49.5	11.5	11.5		9.1	9.1	9.1
Actuated g/C Ratio	0.16	0.60	0.60	0.46	0.45	0.45	0.10	0.10		0.08	0.08	0.08
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	547	2935	885	152	2181	663	362	176		149	157	132
v/s Ratio Prot	c0.10	0.32		0.00	c0.44		c0.05	0.01		c0.02	0.01	
v/s Ratio Perm			0.01	0.04		0.03						0.01
v/c Ratio	0.60	0.53	0.02	0.09	0.97	0.07	0.50	0.08		0.29	0.06	0.16
Uniform Delay, d1	42.7	12.9	8.9	16.0	29.5	17.1	46.5	44.5		47.4	46.5	46.9
Progression Factor	1.50	0.16	1.00	0.47	0.45	0.01	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.5	0.6	0.0	0.1	4.6	0.0	1.1	0.2		1.1	0.2	0.6
Delay (s)	65.8	2.7	8.9	7.6	18.0	0.2	47.6	44.7		48.5	46.7	47.5
Level of Service	E	A	A	A	B	A	D	D		D	D	D
Approach Delay (s)		13.5			17.1			47.1			47.6	
Approach LOS		B			B			D			D	

Intersection Summary

HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	413	919	304	62	1761	108	67	375	184	496
v/c Ratio	0.95	0.43	0.38	0.20	1.05	0.53	0.08	0.83	0.21	0.95
Control Delay	90.3	20.7	5.6	15.9	71.6	59.7	12.8	46.3	30.4	53.1
Queue Delay	0.0	0.0	0.0	0.0	21.3	0.0	0.0	0.0	0.0	1.0
Total Delay	90.3	20.7	5.6	15.9	92.9	59.7	12.8	46.3	30.4	54.1
Queue Length 50th (m)	~54.6	33.3	3.4	6.9	~158.4	12.3	1.9	62.3	16.2	71.8
Queue Length 95th (m)	#92.7	46.9	27.0	14.2	#189.8	21.8	7.3	#110.2	25.5	#137.7
Internal Link Dist (m)		141.6			238.0		219.7		226.0	
Turn Bay Length (m)	70.0		50.0	120.0		95.0		110.0		45.0
Base Capacity (vph)	434	2143	799	310	1679	205	958	454	975	554
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	236	0	0	0	0	8
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.43	0.38	0.20	1.22	0.53	0.07	0.83	0.19	0.91

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)	413	919	304	62	1614	147	108	23	44	375	184	496
Future Volume (vph)	413	919	304	62	1614	147	108	23	44	375	184	496
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.90		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3213	4988	1458	1719	4900		3019	3095		1626	3252	1417
Flt Permitted	0.95	1.00	1.00	0.30	1.00		0.95	1.00		0.62	1.00	1.00
Satd. Flow (perm)	3213	4988	1458	540	4900		3019	3095		1054	3252	1417
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)	413	919	304	62	1614	147	108	23	44	375	184	496
RTOR Reduction (vph)	0	0	179	0	10	0	0	34	0	0	0	132
Lane Group Flow (vph)	413	919	125	62	1751	0	108	33	0	375	184	364
Confl. Peds. (#/hr)	1		3	3		1						
Heavy Vehicles (%)	9%	4%	9%	5%	4%	9%	16%	15%	0%	11%	11%	14%
Turn Type	Prot	NA	Perm	pm+pt	NA		Prot	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)	14.9	45.3	45.3	42.2	36.3		7.4	25.8		42.8	31.4	31.4
Effective Green, g (s)	14.9	45.3	45.3	42.2	36.3		7.4	25.8		42.8	31.4	31.4
Actuated g/C Ratio	0.14	0.41	0.41	0.38	0.33		0.07	0.23		0.39	0.29	0.29
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
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)	435	2054	600	270	1617		203	725		477	928	404
v/s Ratio Prot	c0.13	0.18		0.01	c0.36		0.04	0.01		c0.09	0.06	
v/s Ratio Perm			0.09	0.08						0.21		c0.26
v/c Ratio	0.95	0.45	0.21	0.23	1.08		0.53	0.05		0.79	0.20	0.90
Uniform Delay, d1	47.2	23.3	20.8	21.7	36.9		49.6	32.6		28.4	29.8	37.8
Progression Factor	1.30	0.86	1.60	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	29.7	0.6	0.7	0.4	48.5		2.7	0.0		8.3	0.1	22.5
Delay (s)	90.9	20.7	34.1	22.1	85.3		52.3	32.6		36.7	29.9	60.3
Level of Service	F	C	C	C	F		D	C		D	C	E
Approach Delay (s)		40.9			83.2			44.8			46.6	
Approach LOS		D			F			D			D	

Intersection Summary

HCM 2000 Control Delay	58.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	92.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	88	15	6	62	521	7	1049
v/c Ratio	0.26	0.11	0.01	0.17	0.20	0.01	0.47
Control Delay	19.3	35.5	0.0	5.1	5.8	4.3	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.3	35.5	0.0	5.1	5.8	4.3	10.9
Queue Length 50th (m)	2.2	2.6	0.0	2.0	11.3	0.3	49.0
Queue Length 95th (m)	10.4	8.3	0.0	7.5	36.5	1.7	87.9
Internal Link Dist (m)	115.4		50.9		226.0		199.1
Turn Bay Length (m)				70.0		50.0	
Base Capacity (vph)	723	135	725	360	2585	727	2212
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.11	0.01	0.17	0.20	0.01	0.47

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	0	42	15	0	6	62	502	19	7	998	51
Future Volume (vph)	46	0	42	15	0	6	62	502	19	7	998	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor		0.95		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.93		1.00	0.85		1.00	0.99		1.00	0.99	
Flt Protected		0.97		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3130		1203	1615		1517	3394		1805	3186	
Flt Permitted		0.82		0.46	1.00		0.22	1.00		0.46	1.00	
Satd. Flow (perm)		2644		581	1615		352	3394		872	3186	
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	0	42	15	0	6	62	502	19	7	998	51
RTOR Reduction (vph)	0	59	0	0	5	0	0	2	0	0	2	0
Lane Group Flow (vph)	0	29	0	15	1	0	62	519	0	7	1047	0
Confl. Peds. (#/hr)							1					1
Heavy Vehicles (%)	1%	0%	8%	50%	0%	0%	19%	6%	0%	0%	13%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		7.7		14.3	14.3		77.3	72.0		69.2	67.9	
Effective Green, g (s)		7.7		14.3	14.3		77.3	72.0		69.2	67.9	
Actuated g/C Ratio		0.07		0.14	0.14		0.75	0.69		0.67	0.66	
Clearance Time (s)		6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		196		95	222		323	2358		594	2088	
v/s Ratio Prot				c0.00	0.00		c0.01	0.15		0.00	c0.33	
v/s Ratio Perm		0.01		c0.02			0.13			0.01		
v/c Ratio		0.15		0.16	0.00		0.19	0.22		0.01	0.50	
Uniform Delay, d1		44.9		39.1	38.5		4.6	5.7		5.7	9.2	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3		0.8	0.0		0.3	0.2		0.0	0.9	
Delay (s)		45.2		39.8	38.5		4.8	5.9		5.7	10.0	
Level of Service		D		D	D		A	A		A	B	
Approach Delay (s)		45.2			39.5			5.8			10.0	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	103.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	WBL	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	49	29	6	51	501	6	1076
v/c Ratio	0.23	0.09	0.04	0.11	0.18	0.01	0.45
Control Delay	38.6	0.5	45.0	3.5	4.5	3.5	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.6	0.5	45.0	3.5	4.5	3.5	8.5
Queue Length 50th (m)	8.6	0.0	1.1	1.7	11.0	0.3	50.2
Queue Length 95th (m)	19.2	0.0	5.5	6.3	35.3	1.5	90.0
Internal Link Dist (m)					199.1		252.7
Turn Bay Length (m)	25.0			70.0		70.0	
Base Capacity (vph)	232	421	158	484	2810	801	2406
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.07	0.04	0.11	0.18	0.01	0.45

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	0	29	6	0	0	51	501	0	6	1022	54
Future Volume (vph)	49	0	29	6	0	0	51	501	0	6	1022	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		6.0	4.0			4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00		1.00	1.00			1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Frt	1.00		0.85	1.00			1.00	1.00		1.00	0.99	
Flt Protected	0.95		1.00	0.95			0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1687		961	1805			1805	3406		1805	3272	
Flt Permitted	0.95		1.00	0.00			0.22	1.00		0.47	1.00	
Satd. Flow (perm)	1687		961	0			416	3406		890	3272	
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	0	29	6	0	0	51	501	0	6	1022	54
RTOR Reduction (vph)	0	0	27	0	0	0	0	0	0	0	2	0
Lane Group Flow (vph)	49	0	2	6	0	0	51	501	0	6	1074	0
Confl. Peds. (#/hr)	1											
Heavy Vehicles (%)	7%	0%	68%	0%	0%	0%	0%	6%	0%	0%	10%	0%
Turn Type	pm+pt		Perm	pm+pt			pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	12.8		5.6	1.2			78.4	73.2		70.0	68.8	
Effective Green, g (s)	12.8		5.6	1.2			78.4	73.2		70.0	68.8	
Actuated g/C Ratio	0.13		0.06	0.01			0.77	0.72		0.69	0.68	
Clearance Time (s)	4.0		6.0	4.0			4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0			3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	213		53	21			399	2463		626	2224	
v/s Ratio Prot	c0.03			0.00			c0.01	0.15		0.00	c0.33	
v/s Ratio Perm			0.00				0.09			0.01		
v/c Ratio	0.23		0.03	0.29			0.13	0.20		0.01	0.48	
Uniform Delay, d1	39.8		45.2	49.6			3.6	4.5		4.8	7.7	
Progression Factor	1.00		1.00	1.00			1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6		0.2	7.4			0.1	0.2		0.0	0.8	
Delay (s)	40.3		45.5	56.9			3.7	4.7		4.8	8.5	
Level of Service	D		D	E			A	A		A	A	
Approach Delay (s)		42.2			56.9			4.6			8.5	
Approach LOS		D			E			A			A	

Intersection Summary

HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	101.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	46	27	36	198	31	450	77	1060
v/c Ratio	0.22	0.06	0.13	0.36	0.14	0.22	0.12	0.51
Control Delay	35.2	0.3	33.7	1.8	6.7	10.9	5.7	13.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	0.3	33.7	1.8	6.7	10.9	5.7	13.1
Queue Length 50th (m)	7.9	0.0	6.1	0.0	1.8	23.4	4.6	70.1
Queue Length 95th (m)	18.0	0.0	15.0	0.0	4.9	34.4	9.6	93.8
Internal Link Dist (m)				203.0		252.7		204.9
Turn Bay Length (m)	50.0	50.0	30.0		70.0		65.0	
Base Capacity (vph)	226	578	278	657	237	2047	639	2062
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	0.05	0.13	0.30	0.13	0.22	0.12	0.51

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	0	27	36	0	198	31	449	1	77	1019	41
Future Volume (vph)	46	0	27	36	0	198	31	449	1	77	1019	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00		1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00		0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00		0.85	1.00	0.85		1.00	1.00		1.00	0.99	
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805		1593	1734	1346		1031	3404		1624	3301	
Flt Permitted	0.32		1.00	0.76	1.00		0.22	1.00		0.48	1.00	
Satd. Flow (perm)	603		1593	1382	1346		241	3404		815	3301	
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	0	27	36	0	198	31	449	1	77	1019	41
RTOR Reduction (vph)	0	0	24	0	177	0	0	0	0	0	2	0
Lane Group Flow (vph)	46	0	3	36	21	0	31	450	0	77	1058	0
Confl. Peds. (#/hr)			1	1			5		4	4		5
Heavy Vehicles (%)	0%	0%	0%	4%	0%	20%	75%	6%	4%	11%	9%	0%
Turn Type	pm+pt		Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	18.7		12.6	15.3	10.9		65.7	61.5		68.7	63.0	
Effective Green, g (s)	18.7		12.6	15.3	10.9		65.7	61.5		68.7	63.0	
Actuated g/C Ratio	0.18		0.12	0.15	0.10		0.63	0.59		0.66	0.60	
Clearance Time (s)	4.0		6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	178		192	217	140		183	2009		581	1995	
v/s Ratio Prot	c0.02			0.01	0.02		0.01	0.13		c0.01	c0.32	
v/s Ratio Perm	c0.03		0.00	0.02			0.10			0.08		
v/c Ratio	0.26		0.02	0.17	0.15		0.17	0.22		0.13	0.53	
Uniform Delay, d1	36.3		40.3	38.7	42.4		8.0	10.1		6.4	12.0	
Progression Factor	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.8		0.0	0.4	0.5		0.4	0.3		0.1	1.0	
Delay (s)	37.0		40.4	39.1	42.9		8.4	10.3		6.5	13.0	
Level of Service	D		D	D	D		A	B		A	B	
Approach Delay (s)		38.3			42.3			10.2			12.6	
Approach LOS		D			D			B			B	

Intersection Summary

HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	104.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	0	3	14	0	7	9	611	56	15	948	26
Future Volume (Veh/h)	6	0	3	14	0	7	9	611	56	15	948	26
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	6	0	3	14	0	7	9	611	56	15	948	26
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								229				
pX, platoon unblocked	0.97	0.97		0.97	0.97	0.97				0.97		
vC, conflicting volume	1322	1676	487	1164	1661	334	974			667		
vC1, stage 1 conf vol	991	991		657	657							
vC2, stage 2 conf vol	330	685		507	1004							
vCu, unblocked vol	1269	1634	487	1106	1619	250	974			594		
tC, single (s)	7.5	6.5	6.9	8.3	6.5	6.9	4.1			4.2		
tC, 2 stage (s)	6.5	5.5		7.3	5.5							
tF (s)	3.5	4.0	3.3	3.9	4.0	3.3	2.2			2.3		
p0 queue free %	98	100	99	95	100	99	99			98		
cM capacity (veh/h)	247	267	526	289	264	733	704			922		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	9	21	9	407	260	15	632	342
Volume Left	6	14	9	0	0	15	0	0
Volume Right	3	7	0	0	56	0	0	26
cSH	300	362	704	1700	1700	922	1700	1700
Volume to Capacity	0.03	0.06	0.01	0.24	0.15	0.02	0.37	0.20
Queue Length 95th (m)	0.7	1.5	0.3	0.0	0.0	0.4	0.0	0.0
Control Delay (s)	17.4	15.6	10.2	0.0	0.0	9.0	0.0	0.0
Lane LOS	C	C	B			A		
Approach Delay (s)	17.4	15.6	0.1			0.1		
Approach LOS	C	C						

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	37.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	27	25	102	520	964	113
Future Volume (Veh/h)	27	25	102	520	964	113
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	27	25	102	520	964	113
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)					276	
pX, platoon unblocked	0.98	0.98	0.98			
vC, conflicting volume	1484	538	1077			
vC1, stage 1 conf vol	1020					
vC2, stage 2 conf vol	464					
vCu, unblocked vol	1454	489	1039			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	95	85			
cM capacity (veh/h)	281	520	664			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	27	25	102	260	260	643	434
Volume Left	27	0	102	0	0	0	0
Volume Right	0	25	0	0	0	0	113
cSH	281	520	664	1700	1700	1700	1700
Volume to Capacity	0.10	0.05	0.15	0.15	0.15	0.38	0.26
Queue Length 95th (m)	2.5	1.2	4.3	0.0	0.0	0.0	0.0
Control Delay (s)	19.2	12.3	11.4	0.0	0.0	0.0	0.0
Lane LOS	C	B	B				
Approach Delay (s)	15.9		1.9			0.0	
Approach LOS	C						

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	49.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	6	25	509	1057	26
Future Volume (Veh/h)	9	6	25	509	1057	26
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	9	6	25	509	1057	26
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)					122	
pX, platoon unblocked	0.95	0.95	0.95			
vC, conflicting volume	1374	542	1083			
vC1, stage 1 conf vol	1070					
vC2, stage 2 conf vol	304					
vCu, unblocked vol	1292	417	986			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	99	96			
cM capacity (veh/h)	297	562	675			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	15	25	254	254	705	378
Volume Left	9	25	0	0	0	0
Volume Right	6	0	0	0	0	26
cSH	366	675	1700	1700	1700	1700
Volume to Capacity	0.04	0.04	0.15	0.15	0.41	0.22
Queue Length 95th (m)	1.0	0.9	0.0	0.0	0.0	0.0
Control Delay (s)	15.3	10.5	0.0	0.0	0.0	0.0
Lane LOS	C	B				
Approach Delay (s)	15.3	0.5			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	40.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	143	669	421	411	667	243	114	396	54	248	303
v/c Ratio	0.40	0.64	0.68	0.86	0.48	0.33	0.31	0.42	0.17	0.28	0.58
Control Delay	17.8	38.0	23.5	36.4	25.3	9.4	28.2	35.5	26.1	35.4	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
Total Delay	17.8	38.0	23.5	36.4	25.3	9.4	28.2	35.5	26.1	35.4	8.9
Queue Length 50th (m)	15.7	71.5	43.4	54.8	59.4	13.0	17.9	39.9	8.1	24.5	0.0
Queue Length 95th (m)	26.3	97.3	85.4	#96.2	76.3	30.9	33.8	58.8	18.3	38.4	26.1
Internal Link Dist (m)		842.4			279.6			97.5		104.6	
Turn Bay Length (m)	25.0		25.0	40.0		25.0	100.0		40.0		50.0
Base Capacity (vph)	367	1073	629	538	1552	796	367	946	318	886	526
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	0.39	0.62	0.67	0.76	0.43	0.31	0.31	0.42	0.17	0.28	0.58

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	669	421	411	667	243	114	348	48	54	248	303
Future Volume (vph)	143	669	421	411	667	243	114	348	48	54	248	303
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
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)	1641	3406	1538	1736	3343	1538	1595	3310		1611	3374	1151
Flt Permitted	0.40	1.00	1.00	0.22	1.00	1.00	0.56	1.00		0.46	1.00	1.00
Satd. Flow (perm)	688	3406	1538	404	3343	1538	939	3310		784	3374	1151
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	669	421	411	667	243	114	348	48	54	248	303
RTOR Reduction (vph)	0	0	146	0	0	89	0	9	0	0	0	222
Lane Group Flow (vph)	143	669	275	411	667	154	114	387	0	54	248	81
Confl. Peds. (#/hr)							3		2	2		3
Heavy Vehicles (%)	10%	6%	5%	4%	8%	5%	13%	7%	6%	12%	7%	38%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	44.6	35.3	35.3	61.3	48.0	48.0	39.4	32.4		36.4	30.9	30.9
Effective Green, g (s)	44.6	35.3	35.3	61.3	48.0	48.0	39.4	32.4		36.4	30.9	30.9
Actuated g/C Ratio	0.39	0.31	0.31	0.53	0.42	0.42	0.34	0.28		0.32	0.27	0.27
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	6.0
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)	343	1043	471	469	1392	640	361	930		287	905	308
v/s Ratio Prot	0.03	0.20		c0.17	0.20		c0.02	c0.12		0.01	0.07	
v/s Ratio Perm	0.13		0.18	c0.30		0.10	0.09			0.05		0.07
v/c Ratio	0.42	0.64	0.58	0.88	0.48	0.24	0.32	0.42		0.19	0.27	0.26
Uniform Delay, d1	23.7	34.5	33.7	20.0	24.5	21.8	26.9	33.7		27.9	33.3	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
Incremental Delay, d2	0.8	1.4	1.8	16.6	0.3	0.2	0.5	1.4		0.3	0.7	2.1
Delay (s)	24.5	35.8	35.6	36.6	24.8	22.0	27.4	35.1		28.3	34.0	35.3
Level of Service	C	D	D	D	C	C	C	D		C	C	D
Approach Delay (s)		34.4			27.9			33.4			34.1	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	115.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	94.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	44	1379	392	1369	98	54	31	181
v/c Ratio	0.16	0.67	0.79	0.44	0.44	0.13	0.13	0.44
Control Delay	10.0	28.0	56.0	6.9	43.0	22.1	36.0	20.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.0	28.0	56.0	6.9	43.0	22.1	36.0	20.4
Queue Length 50th (m)	2.6	89.7	76.9	17.8	18.6	1.8	5.7	6.3
Queue Length 95th (m)	5.9	117.9	110.4	38.7	33.9	8.2	13.9	17.5
Internal Link Dist (m)		279.4		63.9		107.8		187.7
Turn Bay Length (m)	60.0		25.0		45.0		50.0	
Base Capacity (vph)	280	2069	505	3078	225	753	240	876
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	0.16	0.67	0.78	0.44	0.44	0.07	0.13	0.21

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	1247	132	392	1283	86	98	17	37	31	57	124
Future Volume (vph)	44	1247	132	392	1283	86	98	17	37	31	57	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.90		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	4874		1752	4850		1656	2958		1570	3189	
Flt Permitted	0.19	1.00		0.10	1.00		0.51	1.00		0.72	1.00	
Satd. Flow (perm)	354	4874		177	4850		886	2958		1189	3189	
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)	44	1247	132	392	1283	86	98	17	37	31	57	124
RTOR Reduction (vph)	0	10	0	0	5	0	0	32	0	0	111	0
Lane Group Flow (vph)	44	1369	0	392	1364	0	98	22	0	31	70	0
Confl. Peds. (#/hr)			5	5								
Heavy Vehicles (%)	0%	5%	2%	3%	6%	5%	9%	4%	12%	15%	5%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	49.0	44.8		74.7	66.5		22.3	14.8		16.3	11.8	
Effective Green, g (s)	49.0	44.8		74.7	66.5		22.3	14.8		16.3	11.8	
Actuated g/C Ratio	0.45	0.41		0.68	0.60		0.20	0.13		0.15	0.11	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	213	1985		491	2932		232	397		191	342	
v/s Ratio Prot	0.01	0.28		c0.19	0.28		c0.03	0.01		0.01	0.02	
v/s Ratio Perm	0.08			c0.35			c0.06			0.02		
v/c Ratio	0.21	0.69		0.80	0.47		0.42	0.06		0.16	0.21	
Uniform Delay, d1	17.3	26.9		27.6	12.0		37.2	41.5		40.7	44.8	
Progression Factor	1.00	1.00		1.95	0.60		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	2.0		6.4	0.4		1.2	0.1		0.4	0.3	
Delay (s)	17.8	28.9		60.1	7.6		38.4	41.6		41.1	45.1	
Level of Service	B	C		E	A		D	D		D	D	
Approach Delay (s)		28.5			19.3			39.6			44.5	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.0
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	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	12	739	16	108	534	171	20	115	114	168	288	97
v/c Ratio	0.03	0.39	0.02	0.34	0.28	0.18	0.05	0.09	0.18	0.37	0.23	0.15
Control Delay	13.2	16.7	2.6	19.1	15.3	2.5	25.9	25.8	5.4	31.5	27.5	5.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.2	16.7	2.6	19.1	15.3	2.5	25.9	25.8	5.4	31.5	27.5	5.7
Queue Length 50th (m)	1.3	53.5	0.0	14.4	36.0	0.0	3.2	9.8	0.0	30.6	26.0	0.0
Queue Length 95th (m)	4.5	67.7	2.2	28.6	47.1	10.3	9.0	16.7	12.4	50.9	37.1	11.6
Internal Link Dist (m)		263.0			842.4			272.7			130.1	
Turn Bay Length (m)	60.0		60.0	60.0		60.0	60.0		60.0	60.0		60.0
Base Capacity (vph)	427	1916	869	321	1916	935	374	1268	640	453	1268	629
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	0.03	0.39	0.02	0.34	0.28	0.18	0.05	0.09	0.18	0.37	0.23	0.15

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	739	16	108	534	171	20	115	114	168	288	97
Future Volume (vph)	12	739	16	108	534	171	20	115	114	168	288	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	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)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.42	1.00	1.00	0.32	1.00	1.00	0.56	1.00	1.00	0.68	1.00	1.00
Satd. Flow (perm)	790	3539	1583	594	3539	1583	1045	3539	1583	1265	3539	1583
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)	12	739	16	108	534	171	20	115	114	168	288	97
RTOR Reduction (vph)	0	0	7	0	0	78	0	0	73	0	0	62
Lane Group Flow (vph)	12	739	9	108	534	93	20	115	41	168	288	35
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	65.0	65.0	65.0	65.0	65.0	65.0	43.0	43.0	43.0	43.0	43.0	43.0
Effective Green, g (s)	65.0	65.0	65.0	65.0	65.0	65.0	43.0	43.0	43.0	43.0	43.0	43.0
Actuated g/C Ratio	0.54	0.54	0.54	0.54	0.54	0.54	0.36	0.36	0.36	0.36	0.36	0.36
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Grp Cap (vph)	427	1916	857	321	1916	857	374	1268	567	453	1268	567
v/s Ratio Prot		c0.21			0.15			0.03			0.08	
v/s Ratio Perm	0.02		0.01	0.18		0.06	0.02		0.03	c0.13		0.02
v/c Ratio	0.03	0.39	0.01	0.34	0.28	0.11	0.05	0.09	0.07	0.37	0.23	0.06
Uniform Delay, d1	12.8	15.9	12.7	15.4	14.8	13.4	25.2	25.5	25.4	28.5	26.9	25.3
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	0.1	0.6	0.0	2.8	0.4	0.3	0.3	0.1	0.2	2.3	0.4	0.2
Delay (s)	12.9	16.5	12.7	18.2	15.2	13.6	25.5	25.7	25.6	30.8	27.3	25.5
Level of Service	B	B	B	B	B	B	C	C	C	C	C	C
Approach Delay (s)		16.4			15.3			25.6			28.1	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	19.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	B38	B38	B38	WB	WB	WB	WB
Directions Served	L	T	T	T	TR	T	T	T	L	L	T	T
Maximum Queue (m)	66.2	108.8	108.4	102.2	95.3	83.8	80.4	74.5	57.6	59.3	71.2	83.7
Average Queue (m)	13.4	69.0	72.1	51.9	38.2	30.0	31.2	28.2	31.8	38.4	29.5	37.8
95th Queue (m)	50.8	136.6	133.1	108.8	89.3	92.2	94.5	88.3	49.7	55.0	57.3	72.3
Link Distance (m)		86.5	86.5	86.5	86.5	66.0	66.0	66.0			114.0	114.0
Upstream Blk Time (%)		37	37	8	2	16	14	9			0	0
Queuing Penalty (veh)		122	122	25	7	68	62	41			0	0
Storage Bay Dist (m)	70.0								65.0	65.0		
Storage Blk Time (%)		40							0	0	0	
Queuing Penalty (veh)		11							0	1	0	

Intersection: 3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

Movement	WB	NB	NB	NB	SB	SB	SB
Directions Served	TR	L	T	R	L	T	TR
Maximum Queue (m)	91.7	9.8	8.8	64.9	47.4	184.2	139.2
Average Queue (m)	48.3	1.1	1.0	27.2	42.8	72.2	19.8
95th Queue (m)	83.1	5.8	5.5	58.8	55.5	175.4	85.6
Link Distance (m)	114.0		85.8	85.8		180.4	180.4
Upstream Blk Time (%)	0			1		5	0
Queuing Penalty (veh)	0			0		0	0
Storage Bay Dist (m)		20.0			40.0		
Storage Blk Time (%)					49	1	
Queuing Penalty (veh)					7	1	

Intersection: 6: Mapleview Drive W & Highway 400 SB Off-Ramp

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	T	R	L	T	T	T	L	L	R
Maximum Queue (m)	127.0	125.7	125.0	123.9	85.0	127.4	101.3	90.1	76.1	307.0	346.4	336.3
Average Queue (m)	103.6	109.7	90.7	72.2	25.6	59.5	38.6	34.9	42.8	252.7	284.8	215.4
95th Queue (m)	146.4	139.6	139.1	123.5	78.1	102.2	70.5	64.4	67.0	374.1	420.1	441.1
Link Distance (m)	114.0	114.0	114.0	114.0			168.4	168.4	168.4		326.9	326.9
Upstream Blk Time (%)	21	26	3	1			0				48	24
Queuing Penalty (veh)	89	112	14	6			0				0	0
Storage Bay Dist (m)					45.0	135.0				300.0		
Storage Blk Time (%)				22	0	0				15	52	20
Queuing Penalty (veh)				44	0	2				49	174	71

Intersection: 6: Mapleview Drive W & Highway 400 SB Off-Ramp

Movement	SB	B36	B36
Directions Served	R	T	T
Maximum Queue (m)	291.1	153.7	152.8
Average Queue (m)	140.3	93.1	92.1
95th Queue (m)	349.4	240.8	239.9
Link Distance (m)		176.9	176.9
Upstream Blk Time (%)		42	42
Queuing Penalty (veh)		0	0
Storage Bay Dist (m)	300.0		
Storage Blk Time (%)	0		
Queuing Penalty (veh)	1		

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (m)	79.3	179.6	181.4	176.8	163.0	140.3	106.3	116.4	122.4	114.6	120.2	131.5
Average Queue (m)	24.7	73.8	100.0	77.3	61.0	64.6	35.1	38.5	64.7	52.3	47.7	51.4
95th Queue (m)	62.3	187.1	222.4	195.7	163.1	116.0	74.4	75.8	108.1	95.5	98.0	115.1
Link Distance (m)		168.4	168.4	168.4	168.4	218.3	218.3	218.3			335.8	335.8
Upstream Blk Time (%)		13	22	2	0			0				
Queuing Penalty (veh)		70	117	13	3			0				
Storage Bay Dist (m)	130.0								130.0	265.0		
Storage Blk Time (%)	0	1						0	0			
Queuing Penalty (veh)	0	1						0	2			

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	NB
Directions Served	R
Maximum Queue (m)	111.7
Average Queue (m)	35.0
95th Queue (m)	95.6
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	265.0
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	L
Maximum Queue (m)	177.5	194.9	228.2	221.8	156.5	10.3	11.9	126.4	131.1	134.6	104.5	57.2
Average Queue (m)	148.4	159.3	150.5	51.6	39.0	1.1	2.6	36.4	37.9	56.6	10.6	22.2
95th Queue (m)	213.8	233.7	299.4	177.5	122.9	5.8	9.1	86.9	91.5	118.0	60.0	46.7
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)			33	4	0			1	1	2	0	
Queuing Penalty (veh)			229	26	1			3	4	12	2	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)	38	55	11		0			6				0
Queuing Penalty (veh)	198	285	35		0			1				0

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R
Maximum Queue (m)	76.6	26.0	34.8	14.3	76.4
Average Queue (m)	35.7	7.2	10.9	3.1	38.3
95th Queue (m)	63.6	18.2	25.9	10.5	70.0
Link Distance (m)	128.7	128.7		96.0	96.0
Upstream Blk Time (%)					0
Queuing Penalty (veh)					0
Storage Bay Dist (m)			60.0		
Storage Blk Time (%)	5				
Queuing Penalty (veh)	4				

Intersection: 15: Bayview Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	T	R	L	T	T	TR	L	L
Maximum Queue (m)	79.5	85.0	67.5	49.1	50.3	60.3	144.4	252.4	260.2	261.6	39.2	47.2
Average Queue (m)	38.5	40.9	16.2	24.8	29.0	24.3	16.6	213.1	249.3	251.8	9.6	22.2
95th Queue (m)	73.6	76.5	39.6	41.4	45.1	47.2	70.9	296.4	257.1	257.8	27.3	43.0
Link Distance (m)			131.2	131.2	131.2			244.4	244.4	244.4		
Upstream Blk Time (%)								6	42	88		
Queuing Penalty (veh)								0	0	0		
Storage Bay Dist (m)	70.0	70.0				50.0	120.0				95.0	95.0
Storage Blk Time (%)	1	2			0	1		12				
Queuing Penalty (veh)	3	6			1	3		7				

Intersection: 15: Bayview Drive & Mapleview Drive W

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	TR	L	T	T	R
Maximum Queue (m)	17.4	18.4	117.5	218.9	189.8	80.0
Average Queue (m)	3.8	5.4	117.2	202.4	62.9	47.2
95th Queue (m)	11.5	12.7	119.1	262.3	165.3	92.9
Link Distance (m)	218.2	218.2		214.5	214.5	
Upstream Blk Time (%)				36	0	
Queuing Penalty (veh)				190	2	
Storage Bay Dist (m)			110.0			45.0
Storage Blk Time (%)			84	5	1	14
Queuing Penalty (veh)			78	19	3	13

Intersection: 18: Bayview Drive & South Village Way/Barrie Molson Centre D/W

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	24.7	24.7	43.0	9.1	29.7	46.2	48.4	47.4	188.9	190.9
Average Queue (m)	9.6	8.9	13.4	1.2	11.0	11.2	12.4	5.0	118.6	114.7
95th Queue (m)	20.5	20.6	42.9	6.2	25.2	33.0	34.3	30.5	241.5	236.1
Link Distance (m)	126.0	126.0	60.2	60.2		214.5	214.5		195.2	195.2
Upstream Blk Time (%)			5						17	9
Queuing Penalty (veh)			0						90	48
Storage Bay Dist (m)					70.0			50.0		
Storage Blk Time (%)								0	54	
Queuing Penalty (veh)								0	4	

Intersection: 21: Bayview Drive & North Village Way/Private D/W

Movement	EB	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	L	T	TR	L	T	TR
Maximum Queue (m)	24.2	45.2	12.8	19.2	47.2	45.3	21.8	173.9	183.5
Average Queue (m)	10.5	13.1	2.4	6.5	8.5	9.4	1.7	72.0	80.4
95th Queue (m)	21.4	35.5	9.2	15.5	28.1	28.5	16.6	200.6	206.0
Link Distance (m)		71.5	75.9		195.2	195.2		247.7	247.7
Upstream Blk Time (%)		0						2	2
Queuing Penalty (veh)		0						13	13
Storage Bay Dist (m)	25.0			70.0			70.0		
Storage Blk Time (%)	1							21	
Queuing Penalty (veh)	0							1	

Intersection: 24: Bayview Drive & Concert Way/Churchill Drive

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	22.8	13.9	34.1	41.2	39.1	38.7	44.7	38.1	91.4	108.6
Average Queue (m)	9.3	5.7	8.1	21.2	10.0	10.3	10.0	11.3	36.1	43.6
95th Queue (m)	20.2	13.6	20.5	34.2	28.6	27.7	29.1	36.4	94.4	101.8
Link Distance (m)				212.1		247.7	247.7		206.5	206.5
Upstream Blk Time (%)									1	1
Queuing Penalty (veh)									2	3
Storage Bay Dist (m)	50.0	50.0	30.0		70.0			65.0		
Storage Blk Time (%)			0	2				0	4	
Queuing Penalty (veh)			0	1				0	3	

Intersection: 28: Bayview Drive & Industrial Site D/W South/Coca-Cola D/W

Movement	EB	WB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	L	T	TR
Maximum Queue (m)	9.1	24.0	8.3	12.0	8.0	10.8
Average Queue (m)	2.1	6.6	1.2	1.8	0.5	0.7
95th Queue (m)	8.2	18.5	5.9	8.2	7.5	9.2
Link Distance (m)	177.2	182.1			206.3	206.3
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			15.0	15.0		
Storage Blk Time (%)				0	0	
Queuing Penalty (veh)				0	0	

Intersection: 29: Bayview Drive & Medical Centre South D/W - Industrial Site D/W North

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (m)	18.1	11.9	20.1	35.0	7.4	1.1	9.9
Average Queue (m)	6.6	4.7	10.9	2.4	0.5	0.0	1.1
95th Queue (m)	15.5	12.4	19.0	18.6	7.2	0.8	5.6
Link Distance (m)	102.1	102.1		206.3	206.3	137.8	137.8
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (m)			15.0				
Storage Blk Time (%)			5				
Queuing Penalty (veh)			12				

Intersection: 31: Bayview Drive & Medical Centre North D/W

Movement	EB	NB	NB
Directions Served	LR	L	T
Maximum Queue (m)	11.8	16.6	11.0
Average Queue (m)	4.7	4.0	0.7
95th Queue (m)	12.3	12.3	8.2
Link Distance (m)	108.5		137.8
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)		15.0	
Storage Blk Time (%)		0	0
Queuing Penalty (veh)		1	0

Intersection: 33: Bayview Drive & Big Bay Point Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	TR	L
Maximum Queue (m)	74.8	107.6	117.7	75.0	94.8	153.4	131.9	74.1	58.6	82.6	75.0	26.1
Average Queue (m)	26.6	58.1	61.2	44.1	63.9	60.7	51.4	17.8	23.2	45.2	25.8	11.0
95th Queue (m)	60.2	89.1	94.0	80.9	101.9	122.0	97.2	41.2	46.9	73.5	60.0	23.8
Link Distance (m)		833.7	833.7			287.9	287.9			92.4	92.4	
Upstream Blk Time (%)									0	0	0	
Queuing Penalty (veh)									0	0	0	
Storage Bay Dist (m)	25.0			25.0	40.0			25.0	100.0			40.0
Storage Blk Time (%)	6	37	38	17	33	11	22	1	0	0		
Queuing Penalty (veh)	21	52	161	58	109	44	53	3	0	0		

Intersection: 33: Bayview Drive & Big Bay Point Road

Movement	SB	SB	SB	B37
Directions Served	T	T	R	T
Maximum Queue (m)	52.7	109.3	70.0	1.2
Average Queue (m)	29.2	28.3	42.5	0.0
95th Queue (m)	46.7	70.8	71.2	0.9
Link Distance (m)	101.3	101.3		41.5
Upstream Blk Time (%)		0		
Queuing Penalty (veh)		0		
Storage Bay Dist (m)			50.0	
Storage Blk Time (%)	3	0	8	
Queuing Penalty (veh)	2	0	10	

Intersection: 39: Bryne Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	B38	B38	NB	NB
Directions Served	L	T	T	TR	L	T	T	TR	T	T	L	T
Maximum Queue (m)	67.3	255.5	261.2	261.2	32.3	89.6	68.2	66.6	53.4	23.2	67.4	41.4
Average Queue (m)	13.2	102.6	110.9	102.0	31.2	58.5	36.6	34.0	4.7	1.1	26.5	4.9
95th Queue (m)	45.2	234.0	238.9	232.3	35.3	98.5	66.5	57.5	28.0	11.2	55.3	25.4
Link Distance (m)		286.7	286.7	286.7		66.0	66.0	66.0	86.5	86.5		103.6
Upstream Blk Time (%)		5	7	8		14	0	0	0			0
Queuing Penalty (veh)		0	0	0		83	2	2	1			0
Storage Bay Dist (m)	60.0				25.0						45.0	
Storage Blk Time (%)	0	29			44	2					6	0
Queuing Penalty (veh)	0	13			189	8					0	0

Intersection: 39: Bryne Drive & Mapleview Drive W

Movement	NB	SB	SB	SB
Directions Served	TR	L	T	TR
Maximum Queue (m)	26.6	28.2	39.0	35.2
Average Queue (m)	7.2	10.0	15.0	14.6
95th Queue (m)	19.3	24.2	30.6	25.6
Link Distance (m)	103.6		194.0	194.0
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)		50.0		
Storage Blk Time (%)			0	
Queuing Penalty (veh)			0	

Intersection: 43: Byrne Road/Bryne Road & Harvie Road/Big Bay Point Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	R
Maximum Queue (m)	12.9	76.7	73.7	10.4	54.8	56.3	58.9	33.4	14.0	30.6	12.9	26.4
Average Queue (m)	2.4	43.8	37.7	1.8	20.2	20.6	25.5	10.7	3.7	15.0	2.9	9.7
95th Queue (m)	9.5	67.8	63.9	7.7	41.1	44.5	47.4	24.1	10.7	28.4	9.1	19.7
Link Distance (m)		270.7	270.7			833.7	833.7			277.4	277.4	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	60.0			60.0	60.0			60.0	60.0			60.0
Storage Blk Time (%)		2	1		0	0	0					
Queuing Penalty (veh)		0	0		0	0	0					

Intersection: 43: Byrne Road/Bryne Road & Harvie Road/Big Bay Point Road

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (m)	58.9	48.2	42.3	21.4
Average Queue (m)	31.7	30.2	16.4	7.4
95th Queue (m)	49.9	46.0	33.7	16.3
Link Distance (m)		134.8	134.8	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)	60.0			60.0
Storage Blk Time (%)	0	0		
Queuing Penalty (veh)	0	0		

Network Summary

Network wide Queuing Penalty: 3368

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	314	1863	1729	772	464	240
v/c Ratio	0.70	0.53	0.68	0.53	0.74	0.44
Control Delay	39.0	8.7	10.6	3.7	49.0	29.2
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0
Total Delay	39.0	9.1	10.6	3.7	49.0	29.2
Queue Length 50th (m)	23.6	113.2	36.0	5.6	51.4	19.2
Queue Length 95th (m)	m36.8	130.1	m45.0	m58.2	65.0	30.7
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	483	3514	2556	1468	825	703
Starvation Cap Reductn	0	938	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	0.72	0.68	0.53	0.56	0.34

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)	314	1863	0	0	1729	772	464	0	240	0	0	0
Future Volume (vph)	314	1863	0	0	1729	772	464	0	240	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0			6.0	4.0	6.0		6.0			
Lane Util. Factor	0.97	0.91			0.91	1.00	0.97		0.88			
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)	3213	5036			4893	1468	3242		2561			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3213	5036			4893	1468	3242		2561			
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	1863	0	0	1729	772	464	0	240	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	56	0	0	0
Lane Group Flow (vph)	314	1863	0	0	1729	772	464	0	184	0	0	0
Heavy Vehicles (%)	9%	3%	0%	0%	6%	10%	8%	0%	11%	0%	0%	0%
Turn Type	Prot	NA			NA	Free	Prot		Perm			
Protected Phases	5	2			6		8					
Permitted Phases						Free			8			
Actuated Green, G (s)	15.3	76.8			57.5	110.0	21.2		21.2			
Effective Green, g (s)	15.3	76.8			57.5	110.0	21.2		21.2			
Actuated g/C Ratio	0.14	0.70			0.52	1.00	0.19		0.19			
Clearance Time (s)	4.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)	446	3516			2557	1468	624		493			
v/s Ratio Prot	c0.10	0.37			c0.35		c0.14					
v/s Ratio Perm						0.53			0.07			
v/c Ratio	0.70	0.53			0.68	0.53	0.74		0.37			
Uniform Delay, d1	45.2	8.0			19.4	0.0	41.8		38.6			
Progression Factor	0.73	0.98			0.48	1.00	1.00		1.00			
Incremental Delay, d2	3.5	0.4			0.7	0.7	4.8		0.5			
Delay (s)	36.2	8.2			10.0	0.7	46.6		39.1			
Level of Service	D	A			A	A	D		D			
Approach Delay (s)		12.2			7.1			44.1			0.0	
Approach LOS		B			A			D			A	

Intersection Summary

HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	78.3%	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	SBR
Lane Group Flow (vph)	327	1566	30	13	2109	96	180	40	43	10	215
v/c Ratio	0.52	0.49	0.03	0.05	0.96	0.13	0.50	0.20	0.31	0.07	0.37
Control Delay	68.0	2.3	0.0	3.8	19.9	0.1	51.2	23.7	53.6	47.1	11.5
Queue Delay	0.0	0.0	0.0	0.0	42.9	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.0	2.3	0.0	3.8	62.7	0.1	51.2	23.7	53.6	47.1	11.5
Queue Length 50th (m)	39.7	14.2	0.0	0.4	75.7	0.1	20.2	2.5	9.4	2.2	10.3
Queue Length 95th (m)	56.0	20.9	m0.0	m0.5	m#189.7	m0.0	30.7	12.9	20.8	7.6	30.0
Internal Link Dist (m)		225.6			141.6			127.2		94.6	
Turn Bay Length (m)	160.0		175.0	50.0			50.0		60.0		
Base Capacity (vph)	631	3224	1016	258	2206	741	835	427	137	144	578
Starvation Cap Reductn	0	0	0	0	286	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	0.52	0.49	0.03	0.05	1.10	0.13	0.22	0.09	0.31	0.07	0.37

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)	327	1566	30	13	2109	96	180	12	28	43	10	215
Future Volume (vph)	327	1566	30	13	2109	96	180	12	28	43	10	215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.90		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)	3367	4893	1476	1805	4848	1475	3467	1685		1805	1900	1599
Flt Permitted	0.95	1.00	1.00	0.15	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3367	4893	1476	287	4848	1475	3467	1685		1805	1900	1599
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)	327	1566	30	13	2109	96	180	12	28	43	10	215
RTOR Reduction (vph)	0	0	11	0	0	53	0	25	0	0	0	114
Lane Group Flow (vph)	327	1566	19	13	2109	43	180	15	0	43	10	101
Confl. Peds. (#/hr)	2		1	1		2			1	1		
Heavy Vehicles (%)	4%	6%	8%	0%	7%	8%	1%	0%	0%	0%	0%	1%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases			2	6		6						4
Actuated Green, G (s)	20.6	68.1	68.1	50.3	48.9	48.9	11.5	11.5		7.0	7.0	27.6
Effective Green, g (s)	20.6	68.1	68.1	50.3	48.9	48.9	11.5	11.5		7.0	7.0	27.6
Actuated g/C Ratio	0.19	0.62	0.62	0.46	0.44	0.44	0.10	0.10		0.06	0.06	0.25
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0
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)	630	3029	913	150	2155	655	362	176		114	120	401
v/s Ratio Prot	c0.10	0.32		0.00	c0.44		c0.05	0.01		c0.02	0.01	0.05
v/s Ratio Perm			0.01	0.04		0.03						0.02
v/c Ratio	0.52	0.52	0.02	0.09	0.98	0.07	0.50	0.08		0.38	0.08	0.25
Uniform Delay, d1	40.2	11.7	8.1	16.3	30.0	17.5	46.5	44.5		49.4	48.5	32.9
Progression Factor	1.58	0.17	1.00	0.45	0.47	0.01	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	0.6	0.0	0.1	6.3	0.1	1.1	0.2		2.1	0.3	0.3
Delay (s)	64.0	2.5	8.1	7.5	20.5	0.1	47.6	44.7		51.5	48.8	33.3
Level of Service	E	A	A	A	C	A	D	D		D	D	C
Approach Delay (s)		13.1			19.5			47.1			36.8	
Approach LOS		B			B			D			D	

Intersection Summary

HCM 2000 Control Delay	19.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (m)	53.6	53.4	131.5	90.1	105.4	144.7	85.9	73.5	45.4	72.9	76.2	54.1
Average Queue (m)	25.0	23.9	28.9	20.6	24.4	56.3	29.7	31.5	6.5	44.0	41.6	27.8
95th Queue (m)	46.5	44.0	90.1	65.0	73.7	110.9	62.7	55.4	27.9	65.8	65.6	49.9
Link Distance (m)		168.4	168.4	168.4	168.4	218.3	218.3	218.3			335.8	335.8
Upstream Blk Time (%)			0									
Queuing Penalty (veh)			0									
Storage Bay Dist (m)	130.0								130.0	265.0		
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	NB
Directions Served	R
Maximum Queue (m)	43.8
Average Queue (m)	10.6
95th Queue (m)	30.0
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	265.0
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	L
Maximum Queue (m)	57.4	61.4	49.9	48.9	59.0	12.8	10.6	92.9	97.8	128.4	95.5	38.8
Average Queue (m)	34.4	39.7	22.2	19.5	29.5	1.9	2.5	41.4	40.8	63.1	11.3	12.6
95th Queue (m)	54.8	59.2	42.5	35.6	49.9	8.1	9.0	77.7	80.5	110.9	55.9	27.9
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)										1	0	
Queuing Penalty (veh)										4	1	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)								5				0
Queuing Penalty (veh)								1				0

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R
Maximum Queue (m)	52.3	20.5	22.1	10.7	59.9
Average Queue (m)	24.5	6.1	8.7	1.7	26.7
95th Queue (m)	43.8	15.8	18.3	7.1	48.8
Link Distance (m)	128.7	128.7		96.0	96.0
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)			60.0		
Storage Blk Time (%)	0				
Queuing Penalty (veh)	0				

Zone Summary

Zone wide Queuing Penalty: 6

Lane Group	WBT	NET
Lane Group Flow (vph)	1749	1503
v/c Ratio	0.71	0.76
Control Delay	11.6	31.4
Queue Delay	0.2	0.0
Total Delay	11.8	31.4
Queue Length 50th (m)	36.0	98.8
Queue Length 95th (m)	48.2	111.7
Internal Link Dist (m)	43.5	23.7
Turn Bay Length (m)		
Base Capacity (vph)	2473	2134
Starvation Cap Reductn	193	0
Spillback Cap Reductn	72	4
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.77	0.71

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	1749	0	0	1503	0	0	0	0
Future Volume (vph)	0	0	0	0	1749	0	0	1503	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0			6.0				
Lane Util. Factor					0.91			0.91				
Frt					1.00			1.00				
Flt Protected					1.00			1.00				
Satd. Flow (prot)					4995			4995				
Flt Permitted					1.00			1.00				
Satd. Flow (perm)					4995			4995				
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	0	1749	0	0	1503	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1749	0	0	1503	0	0	0	0
Heavy Vehicles (%)	0%	0%	0%	0%	5%	0%	0%	5%	0%	0%	0%	0%
Turn Type					NA			NA				
Protected Phases					6			8				
Permitted Phases												
Actuated Green, G (s)					54.5			43.5				
Effective Green, g (s)					54.5			43.5				
Actuated g/C Ratio					0.50			0.40				
Clearance Time (s)					6.0			6.0				
Vehicle Extension (s)					3.0			3.0				
Lane Grp Cap (vph)					2474			1975				
v/s Ratio Prot					c0.35			c0.30				
v/s Ratio Perm												
v/c Ratio					0.71			0.76				
Uniform Delay, d1					21.5			28.8				
Progression Factor					0.46			1.00				
Incremental Delay, d2					1.2			1.8				
Delay (s)					11.2			30.5				
Level of Service					B			C				
Approach Delay (s)		0.0			11.2			30.5			0.0	
Approach LOS		A			B			C			A	

Intersection Summary

HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	SBL
Lane Group Flow (vph)	1503	674
v/c Ratio	0.69	0.43
Control Delay	1.4	20.8
Queue Delay	0.2	0.0
Total Delay	1.5	20.8
Queue Length 50th (m)	0.0	48.4
Queue Length 95th (m)	0.0	62.9
Internal Link Dist (m)	41.3	34.0
Turn Bay Length (m)		
Base Capacity (vph)	2179	1578
Starvation Cap Reductn	126	0
Spillback Cap Reductn	1	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.73	0.43

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	1503	0	0	674	0
Future Volume (vph)	0	1503	0	0	674	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0			6.0	
Lane Util. Factor		0.91			0.97	
Frt		1.00			1.00	
Flt Protected		1.00			0.95	
Satd. Flow (prot)		4995			3404	
Flt Permitted		1.00			0.95	
Satd. Flow (perm)		4995			3404	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1503	0	0	674	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1503	0	0	674	0
Heavy Vehicles (%)	0%	5%	0%	0%	4%	0%
Turn Type		NA			Prot	
Protected Phases		4			6	
Permitted Phases						
Actuated Green, G (s)		48.0			51.0	
Effective Green, g (s)		48.0			51.0	
Actuated g/C Ratio		0.44			0.46	
Clearance Time (s)		5.0			6.0	
Vehicle Extension (s)		3.0			3.0	
Lane Grp Cap (vph)		2179			1578	
v/s Ratio Prot		c0.30			c0.20	
v/s Ratio Perm						
v/c Ratio		0.69			0.43	
Uniform Delay, d1		25.0			19.7	
Progression Factor		0.00			1.00	
Incremental Delay, d2		1.3			0.8	
Delay (s)		1.4			20.6	
Level of Service		A			C	
Approach Delay (s)		1.4	0.0		20.6	
Approach LOS		A	A		C	

Intersection Summary

HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	SWT
Lane Group Flow (vph)	1863	1729
v/c Ratio	0.83	0.77
Control Delay	19.9	28.9
Queue Delay	0.5	0.0
Total Delay	20.4	28.9
Queue Length 50th (m)	67.9	114.5
Queue Length 95th (m)	77.5	136.8
Internal Link Dist (m)	50.1	8.2
Turn Bay Length (m)		
Base Capacity (vph)	2360	2234
Starvation Cap Reductn	170	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.85	0.77

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	1863	0	0	0	0	0	0	0	0	1729	0
Future Volume (vph)	0	1863	0	0	0	0	0	0	0	0	1729	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0									6.0	
Lane Util. Factor		0.91									0.91	
Frt		1.00									1.00	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		5092									4948	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		5092									4948	
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	1863	0	0	0	0	0	0	0	0	1729	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1863	0	0	0	0	0	0	0	0	1729	0
Heavy Vehicles (%)	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	6%	0%
Turn Type		NA									NA	
Protected Phases		4									2	
Permitted Phases												
Actuated Green, G (s)		48.3									49.7	
Effective Green, g (s)		48.3									49.7	
Actuated g/C Ratio		0.44									0.45	
Clearance Time (s)		6.0									6.0	
Vehicle Extension (s)		3.0									3.0	
Lane Grp Cap (vph)		2235									2235	
v/s Ratio Prot		c0.37									c0.35	
v/s Ratio Perm												
v/c Ratio		0.83									0.77	
Uniform Delay, d1		27.3									25.4	
Progression Factor		0.62									1.00	
Incremental Delay, d2		2.3									2.7	
Delay (s)		19.1									28.1	
Level of Service		B									C	
Approach Delay (s)		19.1			0.0			0.0			28.1	
Approach LOS		B			A			A			C	

Intersection Summary

HCM 2000 Control Delay	23.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Traffic Volume (veh/h)	0	0	444	1749	0	0
Future Volume (Veh/h)	0	0	444	1749	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	444	1749	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	67			77		
pX, platoon unblocked					0.69	
vC, conflicting volume			0		1471	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		125	0
tC, single (s)			4.3		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			72		100	100
cM capacity (veh/h)			1558		427	1091

Direction, Lane #	WB 1	WB 2	WB 3
Volume Total	794	700	700
Volume Left	444	0	0
Volume Right	0	0	0
cSH	1558	1700	1700
Volume to Capacity	0.28	0.41	0.41
Queue Length 95th (m)	9.0	0.0	0.0
Control Delay (s)	5.9	0.0	0.0
Lane LOS	A		
Approach Delay (s)	2.1		
Approach LOS			

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1503	198	0	0	0	0
Future Volume (Veh/h)	1503	198	0	0	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1503	198	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				48		
pX, platoon unblocked						
vC, conflicting volume			1701		1503	501
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1701		1503	501
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			379		114	521

Direction, Lane #	EB 1	EB 2	EB 3	EB 4
Volume Total	501	501	501	198
Volume Left	0	0	0	0
Volume Right	0	0	0	198
cSH	1700	1700	1700	1700
Volume to Capacity	0.29	0.29	0.29	0.12
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0			
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		

Lane Group	WBT	SBR
Lane Group Flow (vph)	1749	723
v/c Ratio	0.76	0.61
Control Delay	2.4	26.7
Queue Delay	0.0	0.0
Total Delay	2.4	26.7
Queue Length 50th (m)	0.1	65.9
Queue Length 95th (m)	0.2	87.0
Internal Link Dist (m)	10.7	
Turn Bay Length (m)		
Base Capacity (vph)	2315	1186
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.76	0.61

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	1749	0	0	723
Future Volume (vph)	0	0	1749	0	0	723
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			6.0			6.0
Lane Util. Factor			0.91			0.88
Frt			1.00			0.85
Flt Protected			1.00			1.00
Satd. Flow (prot)			4995			2763
Flt Permitted			1.00			1.00
Satd. Flow (perm)			4995			2763
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	1749	0	0	723
RTOR Reduction (vph)	0	0	0	0	0	6
Lane Group Flow (vph)	0	0	1749	0	0	717
Heavy Vehicles (%)	0%	0%	5%	0%	0%	4%
Turn Type			NA			Prot
Protected Phases			2			8
Permitted Phases						
Actuated Green, G (s)			51.0			47.0
Effective Green, g (s)			51.0			47.0
Actuated g/C Ratio			0.46			0.43
Clearance Time (s)			6.0			6.0
Lane Grp Cap (vph)			2315			1180
v/s Ratio Prot			c0.35			c0.26
v/s Ratio Perm						
v/c Ratio			0.76			0.61
Uniform Delay, d1			24.4			24.4
Progression Factor			0.03			1.00
Incremental Delay, d2			1.6			2.3
Delay (s)			2.4			26.7
Level of Service			A			C
Approach Delay (s)		0.0	2.4		26.7	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	9.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (veh/h)	0	0	1729	772	0	0
Future Volume (Veh/h)	0	0	1729	772	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	1729	772	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		32				
pX, platoon unblocked						
vC, conflicting volume	2501				1729	576
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2501				1729	576
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	185				81	465

Direction, Lane #	WB 1	WB 2	WB 3	WB 4
Volume Total	576	576	576	772
Volume Left	0	0	0	0
Volume Right	0	0	0	772
cSH	1700	1700	1700	1700
Volume to Capacity	0.34	0.34	0.34	0.45
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0			
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBT	NBR
Lane Group Flow (vph)	1863	240
v/c Ratio	0.77	0.21
Control Delay	1.4	18.9
Queue Delay	0.1	0.0
Total Delay	1.5	18.9
Queue Length 50th (m)	0.0	16.9
Queue Length 95th (m)	0.0	25.9
Internal Link Dist (m)	26.5	
Turn Bay Length (m)		
Base Capacity (vph)	2430	1145
Starvation Cap Reductn	64	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.79	0.21

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1863	0	0	0	0	240
Future Volume (vph)	1863	0	0	0	0	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5					4.5
Lane Util. Factor	0.91					0.88
Frt	1.00					0.85
Flt Protected	1.00					1.00
Satd. Flow (prot)	5092					2589
Flt Permitted	1.00					1.00
Satd. Flow (perm)	5092					2589
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1863	0	0	0	0	240
RTOR Reduction (vph)	0	0	0	0	0	4
Lane Group Flow (vph)	1863	0	0	0	0	236
Heavy Vehicles (%)	3%	0%	0%	0%	0%	11%
Turn Type	NA					Perm
Protected Phases	4					
Permitted Phases						2
Actuated Green, G (s)	52.5					48.5
Effective Green, g (s)	52.5					48.5
Actuated g/C Ratio	0.48					0.44
Clearance Time (s)	4.5					4.5
Lane Grp Cap (vph)	2430					1141
v/s Ratio Prot	c0.37					
v/s Ratio Perm						c0.09
v/c Ratio	0.77					0.21
Uniform Delay, d1	23.7					18.9
Progression Factor	0.00					1.00
Incremental Delay, d2	1.4					0.4
Delay (s)	1.4					19.3
Level of Service	A					B
Approach Delay (s)	1.4			0.0	19.3	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	3.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Traffic Volume (veh/h)	314	1863	0	0	0	0
Future Volume (Veh/h)	314	1863	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	314	1863	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		75	74			
pX, platoon unblocked					0.76	
vC, conflicting volume	0				1249	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				236	0
tC, single (s)	4.3				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.3				3.5	3.3
p0 queue free %	80				100	100
cM capacity (veh/h)	1572				449	1091

Direction, Lane #	EB 1	EB 2	EB 3
Volume Total	687	745	745
Volume Left	314	0	0
Volume Right	0	0	0
cSH	1572	1700	1700
Volume to Capacity	0.20	0.44	0.44
Queue Length 95th (m)	5.7	0.0	0.0
Control Delay (s)	4.7	0.0	0.0
Lane LOS	A		
Approach Delay (s)	1.5		
Approach LOS			

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	96.8%	ICU Level of Service	F
Analysis Period (min)	15		

Lane Group	WBT	NBL
Lane Group Flow (vph)	1729	464
v/c Ratio	0.82	0.31
Control Delay	5.5	19.1
Queue Delay	0.0	0.0
Total Delay	5.5	19.1
Queue Length 50th (m)	5.3	31.1
Queue Length 95th (m)	7.8	42.4
Internal Link Dist (m)	42.1	32.8
Turn Bay Length (m)		
Base Capacity (vph)	2114	1519
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.82	0.31

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1729	464	0
Future Volume (vph)	0	0	0	1729	464	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.0	6.0	
Lane Util. Factor				0.91	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				4948	3278	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				4948	3278	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	1729	464	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	1729	464	0
Heavy Vehicles (%)	0%	0%	0%	6%	8%	0%
Turn Type				NA	Prot	
Protected Phases				8	2	
Permitted Phases						
Actuated Green, G (s)				47.0	51.0	
Effective Green, g (s)				47.0	51.0	
Actuated g/C Ratio				0.43	0.46	
Clearance Time (s)				6.0	6.0	
Vehicle Extension (s)				3.0	3.0	
Lane Grp Cap (vph)				2114	1519	
v/s Ratio Prot				c0.35	c0.14	
v/s Ratio Perm						
v/c Ratio				0.82	0.31	
Uniform Delay, d1				27.7	18.4	
Progression Factor				0.12	1.00	
Incremental Delay, d2				2.3	0.5	
Delay (s)				5.5	19.0	
Level of Service				A	B	
Approach Delay (s)	0.0			5.5	19.0	
Approach LOS	A			A	B	

Intersection Summary

HCM 2000 Control Delay	8.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 1: West Terminal-E-S

Movement	WB	WB	WB	NE	NE	NE
Directions Served	T	T	T	T	T	T
Maximum Queue (m)	54.9	54.4	50.3	35.7	30.9	29.4
Average Queue (m)	40.3	41.8	35.3	26.0	23.3	19.8
95th Queue (m)	53.3	53.5	52.5	32.5	27.6	30.4
Link Distance (m)	18.6	18.6	18.6	22.8	22.8	22.8
Upstream Blk Time (%)	37	49	40	52	36	15
Queuing Penalty (veh)	215	285	231	260	181	74
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: W-N & N-E

Movement	EB	EB	EB	SB	SB
Directions Served	T	T	T	L	L
Maximum Queue (m)	23.9	15.2	6.0	65.4	59.7
Average Queue (m)	9.4	2.9	1.0	51.4	37.0
95th Queue (m)	19.1	11.2	8.4	66.8	54.5
Link Distance (m)	22.8	22.8	22.8	37.0	37.0
Upstream Blk Time (%)	1	0	1	20	7
Queuing Penalty (veh)	4	2	4	69	23
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: East Terminal

Movement	EB	EB	EB	SW	SW	SW
Directions Served	T	T	T	T	T	T
Maximum Queue (m)	68.8	65.6	63.4	48.6	48.3	43.7
Average Queue (m)	58.4	56.3	49.3	38.0	37.6	33.0
95th Queue (m)	63.8	63.9	65.2	44.7	42.6	46.5
Link Distance (m)	27.3	27.3	27.3	19.8	19.8	19.8
Upstream Blk Time (%)	38	43	35	60	51	30
Queuing Penalty (veh)	237	267	219	346	291	171
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: West Terminal-E-S

Movement	WB	WB	WB
Directions Served	LT	T	T
Maximum Queue (m)	63.2	58.6	52.0
Average Queue (m)	23.0	13.7	6.3
95th Queue (m)	57.4	44.2	28.2
Link Distance (m)	59.5	59.5	59.5
Upstream Blk Time (%)	1	0	0
Queuing Penalty (veh)	7	1	0
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: W-S

Movement	EB	EB	EB	EB
Directions Served	T	T	T	R
Maximum Queue (m)	183.2	158.1	114.0	42.1
Average Queue (m)	121.0	102.9	45.5	2.6
95th Queue (m)	174.2	157.4	109.8	37.8
Link Distance (m)	183.8	183.8	183.8	183.8
Upstream Blk Time (%)	3	2	0	0
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: N-W

Movement	WB	WB	WB	SB	SB
Directions Served	T	T	T	R	R
Maximum Queue (m)	12.9	19.1	21.0	67.3	56.0
Average Queue (m)	1.5	6.7	6.4	54.7	38.1
95th Queue (m)	8.0	16.6	16.7	66.0	50.0
Link Distance (m)	7.7	7.7	7.7	37.2	37.2
Upstream Blk Time (%)	5	24	26	25	6
Queuing Penalty (veh)	28	142	150	92	23
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 12: E-N

Movement	WB	WB	WB	WB
Directions Served	T	T	T	R
Maximum Queue (m)	196.8	185.1	138.1	38.6
Average Queue (m)	154.1	130.5	68.9	3.7
95th Queue (m)	205.5	181.7	129.7	46.8
Link Distance (m)	187.5	187.5	187.5	187.5
Upstream Blk Time (%)	4	1	0	0
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 14: S-E

Movement	EB	EB	EB	NB	NB
Directions Served	T	T	T	R	R
Maximum Queue (m)	7.0	10.4	12.7	50.9	43.1
Average Queue (m)	0.4	1.0	1.8	24.7	12.6
95th Queue (m)	4.7	5.6	9.0	42.4	33.2
Link Distance (m)	20.9	20.9	20.9	48.7	48.7
Upstream Blk Time (%)	0		0	0	0
Queuing Penalty (veh)	2		2	0	0
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 16: W-N/East Terminal

Movement	EB	EB	EB
Directions Served	LT	T	T
Maximum Queue (m)	64.2	55.9	41.6
Average Queue (m)	31.0	22.8	7.5
95th Queue (m)	58.1	50.2	29.0
Link Distance (m)	54.6	54.6	54.6
Upstream Blk Time (%)	2	1	1
Queuing Penalty (veh)	11	5	4
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 17: S-W

Movement	WB	WB	WB	NB	NB
Directions Served	T	T	T	L	L
Maximum Queue (m)	38.6	39.8	36.7	65.5	46.6
Average Queue (m)	27.9	24.6	20.1	44.4	27.2
95th Queue (m)	37.5	37.3	36.5	66.9	47.9
Link Distance (m)	31.8	31.8	31.8	39.6	39.6
Upstream Blk Time (%)	8	4	3	11	1
Queuing Penalty (veh)	47	24	18	26	2
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 3464

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	51	1653	395	1849	60	95	443	319	42
v/c Ratio	0.34	0.62	0.78	0.69	0.19	0.33	0.91	0.73	0.05
Control Delay	23.6	20.4	75.0	11.3	30.2	49.2	40.5	46.0	18.8
Queue Delay	0.0	0.9	0.0	0.2	0.0	0.0	0.7	0.0	0.0
Total Delay	23.6	21.3	75.0	11.4	30.2	49.2	41.2	46.0	18.8
Queue Length 50th (m)	3.8	59.1	44.2	126.1	11.3	23.0	43.0	70.4	2.1
Queue Length 95th (m)	16.4	56.8	64.3	184.3	19.2	36.4	81.2	88.5	6.4
Internal Link Dist (m)		85.2		118.2		85.0			175.8
Turn Bay Length (m)	70.0		65.0		20.0			40.0	
Base Capacity (vph)	153	2686	547	2662	310	453	597	435	1071
Starvation Cap Reductn	0	0	0	172	0	0	0	0	0
Spillback Cap Reductn	0	670	0	0	0	0	30	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.82	0.72	0.74	0.19	0.21	0.78	0.73	0.04

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	51	1609	44	395	1588	261	60	95	443	319	19	23
Future Volume (vph)	51	1609	44	395	1588	261	60	95	443	319	19	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0	6.0	4.0	6.0	
Lane Util. Factor	1.00	0.86		0.97	0.91		1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	0.99	1.00	
Frt	1.00	1.00		1.00	0.98		1.00	1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	6320		3502	4952		1805	1900	1575	1777	3313	
Flt Permitted	0.07	1.00		0.95	1.00		0.73	1.00	1.00	0.58	1.00	
Satd. Flow (perm)	142	6320		3502	4952		1384	1900	1575	1086	3313	
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)	51	1609	44	395	1588	261	60	95	443	319	19	23
RTOR Reduction (vph)	0	2	0	0	15	0	0	0	246	0	17	0
Lane Group Flow (vph)	51	1651	0	395	1834	0	60	95	197	319	25	0
Confl. Peds. (#/hr)	7		1	1		7			6	6		
Heavy Vehicles (%)	0%	3%	2%	0%	2%	3%	0%	0%	0%	1%	0%	0%
Turn Type	pm+pt	NA		Prot	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2						8		8	4		
Actuated Green, G (s)	59.8	54.4		18.9	67.9		25.2	20.7	20.7	40.7	32.2	
Effective Green, g (s)	59.8	54.4		18.9	67.9		25.2	20.7	20.7	40.7	32.2	
Actuated g/C Ratio	0.46	0.42		0.15	0.52		0.19	0.16	0.16	0.31	0.25	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0	6.0	4.0	6.0	
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)	134	2644		509	2586		282	302	250	425	820	
v/s Ratio Prot	0.02	0.26		c0.11	c0.37		0.01	0.05		c0.09	0.01	
v/s Ratio Perm	0.16						0.03		0.13	c0.14		
v/c Ratio	0.38	0.62		0.78	0.71		0.21	0.31	0.79	0.75	0.03	
Uniform Delay, d1	21.1	29.8		53.5	23.6		43.7	48.4	52.6	38.2	37.1	
Progression Factor	1.21	0.63		1.22	0.41		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.6	1.0		6.2	1.4		0.4	0.6	15.2	7.3	0.0	
Delay (s)	27.1	19.7		71.7	11.1		44.1	49.0	67.8	45.5	37.1	
Level of Service	C	B		E	B		D	D	E	D	D	
Approach Delay (s)		19.9			21.7			62.4			44.6	
Approach LOS		B			C			E			D	

Intersection Summary

HCM 2000 Control Delay	27.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	83.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Queues
6: Mapleview Drive W & Highway 400 SB Off-Ramp

210498
2036 Future Total - PM Peak Hour

Lane Group	EBT	EBR	WBL	WBT	SBL	SBR
Lane Group Flow (vph)	2180	189	475	1966	673	278
v/c Ratio	0.89	0.29	0.94	0.57	0.84	0.40
Control Delay	29.8	6.1	40.8	10.6	57.0	33.5
Queue Delay	0.5	0.0	0.0	0.8	3.2	0.0
Total Delay	30.3	6.1	40.8	11.5	60.2	33.5
Queue Length 50th (m)	172.2	4.8	97.3	152.3	88.7	27.8
Queue Length 95th (m)	#162.9	m11.0	m#162.7	178.4	108.3	41.3
Internal Link Dist (m)	118.2			168.8		
Turn Bay Length (m)		45.0	135.0		300.0	300.0
Base Capacity (vph)	2439	643	516	3436	906	778
Starvation Cap Reductn	59	0	0	1045	0	0
Spillback Cap Reductn	45	0	0	341	144	3
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.29	0.92	0.82	0.88	0.36

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

HCM Signalized Intersection Capacity Analysis
6: Mapleview Drive W & Highway 400 SB Off-Ramp

210498
2036 Future Total - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	2180	189	475	1966	0	0	0	0	673	0	278
Future Volume (vph)	0	2180	189	475	1966	0	0	0	0	673	0	278
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0	6.0	4.0	6.0					6.0		6.0
Lane Util. Factor		0.86	1.00	1.00	0.91					0.97		0.88
Frpb, ped/bikes		1.00	1.00	1.00	1.00					1.00		1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00		1.00
Frt		1.00	0.85	1.00	1.00					1.00		0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95		1.00
Satd. Flow (prot)		6408	1553	1736	5136					3367		2733
Flt Permitted		1.00	1.00	0.07	1.00					0.95		1.00
Satd. Flow (perm)		6408	1553	137	5136					3367		2733
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	2180	189	475	1966	0	0	0	0	673	0	278
RTOR Reduction (vph)	0	0	53	0	0	0	0	0	0	0	0	45
Lane Group Flow (vph)	0	2180	136	475	1966	0	0	0	0	673	0	233
Confl. Peds. (#/hr)	4					4						
Heavy Vehicles (%)	0%	2%	4%	4%	1%	0%	0%	0%	0%	4%	0%	4%
Turn Type		NA	Perm	pm+pt	NA					Prot		Perm
Protected Phases		2		1	6					4		
Permitted Phases			2	6								4
Actuated Green, G (s)		49.5	49.5	87.0	87.0					31.0		31.0
Effective Green, g (s)		49.5	49.5	87.0	87.0					31.0		31.0
Actuated g/C Ratio		0.38	0.38	0.67	0.67					0.24		0.24
Clearance Time (s)		6.0	6.0	4.0	6.0					6.0		6.0
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0		3.0
Lane Grp Cap (vph)		2439	591	503	3437					802		651
v/s Ratio Prot		0.34		c0.24	0.38					c0.20		
v/s Ratio Perm			0.09	c0.39								0.09
v/c Ratio		0.89	0.23	0.94	0.57					0.84		0.36
Uniform Delay, d1		37.8	27.3	39.6	11.5					47.1		41.2
Progression Factor		0.65	0.32	0.54	0.85					1.00		1.00
Incremental Delay, d2		4.3	0.7	18.3	0.4					7.7		0.3
Delay (s)		28.7	9.5	39.7	10.2					54.8		41.6
Level of Service		C	A	D	B					D		D
Approach Delay (s)		27.2			15.9			0.0			50.9	
Approach LOS		C			B			A			D	

Intersection Summary

HCM 2000 Control Delay	26.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	113.8%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	683	2169	1946	1079	495	602
v/c Ratio	0.99	0.62	0.83	1.04	0.68	0.96
Control Delay	56.0	16.2	21.5	38.1	52.2	72.2
Queue Delay	0.0	9.1	0.2	23.2	0.0	0.0
Total Delay	56.0	25.3	21.7	61.3	52.3	72.2
Queue Length 50th (m)	82.3	184.6	78.7	~132.4	63.6	83.8
Queue Length 95th (m)	m#121.6	203.0	m70.5	m45.9	83.0	#125.1
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	692	3495	2346	1037	739	634
Starvation Cap Reductn	0	1314	19	61	0	0
Spillback Cap Reductn	0	0	61	0	4	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.99	0.85	1.11	0.67	0.95

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)	683	2169	0	0	1946	1079	495	0	602	0	0	0
Future Volume (vph)	683	2169	0	0	1946	1079	495	0	602	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0			6.0	6.0	6.0		6.0			
Lane Util. Factor	0.97	0.91			0.91	1.00	0.97		0.88			
Frpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00			
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)	3433	5036			5085	1583	3433		2733			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3433	5036			5085	1583	3433		2733			
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)	683	2169	0	0	1946	1079	495	0	602	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	307	0	0	46	0	0	0
Lane Group Flow (vph)	683	2169	0	0	1946	772	495	0	556	0	0	0
Confl. Peds. (#/hr)			3	3								
Heavy Vehicles (%)	2%	3%	0%	0%	2%	2%	2%	0%	4%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Prot		Perm			
Protected Phases	5	2			6		8					
Permitted Phases						6			8			
Actuated Green, G (s)	26.2	90.2			60.0	60.0	27.8		27.8			
Effective Green, g (s)	26.2	90.2			60.0	60.0	27.8		27.8			
Actuated g/C Ratio	0.20	0.69			0.46	0.46	0.21		0.21			
Clearance Time (s)	4.0	6.0			6.0	6.0	6.0		6.0			
Vehicle Extension (s)	3.0	3.0			3.0	3.0	3.0		3.0			
Lane Grp Cap (vph)	691	3494			2346	730	734		584			
v/s Ratio Prot	c0.20	0.43			0.38		0.14					
v/s Ratio Perm						c0.49			c0.20			
v/c Ratio	0.99	0.62			0.83	1.06	0.67		0.95			
Uniform Delay, d1	51.7	10.7			30.5	35.0	46.9		50.4			
Progression Factor	0.65	1.45			0.69	0.95	1.00		1.00			
Incremental Delay, d2	20.9	0.4			0.3	29.5	2.5		25.6			
Delay (s)	54.6	16.0			21.3	62.6	49.4		76.0			
Level of Service	D	B			C	E	D		E			
Approach Delay (s)		25.2			36.0			64.0			0.0	
Approach LOS		C			D			E			A	

Intersection Summary

HCM 2000 Control Delay	36.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	113.8%	ICU Level of Service	H
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)	464	1918	70	72	1802	282	693	91	251	50	533
v/c Ratio	1.33	1.03	0.11	0.44	1.13	0.46	0.84	0.21	0.79	0.15	1.33
Control Delay	210.9	48.5	0.6	26.3	94.1	6.5	56.7	33.0	70.2	48.8	193.1
Queue Delay	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	210.9	48.5	0.6	26.3	94.2	6.5	56.7	33.0	70.2	48.8	193.1
Queue Length 50th (m)	~82.2	~213.0	0.1	7.4	~201.3	5.9	91.3	16.3	66.0	11.6	~155.4
Queue Length 95th (m)	m#111.7	m#238.0	m0.4	m7.9	m#217.4	m6.6	111.0	30.6	#121.6	24.6	#236.8
Internal Link Dist (m)		225.6			141.6			127.2		94.6	
Turn Bay Length (m)	160.0		175.0	50.0			50.0		60.0		
Base Capacity (vph)	350	1855	660	163	1588	612	933	491	318	335	402
Starvation Cap Reductn	0	0	0	0	46	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	1.33	1.03	0.11	0.44	1.17	0.46	0.74	0.19	0.79	0.15	1.33

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)	464	1918	70	72	1802	282	693	65	26	251	50	533
Future Volume (vph)	464	1918	70	72	1802	282	693	65	26	251	50	533
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		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)	3502	4940	1578	1787	5036	1529	3467	1786		1805	1900	1615
Flt Permitted	0.95	1.00	1.00	0.10	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	4940	1578	184	5036	1529	3467	1786		1805	1900	1615
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)	464	1918	70	72	1802	282	693	65	26	251	50	533
RTOR Reduction (vph)	0	0	44	0	0	130	0	11	0	0	0	118
Lane Group Flow (vph)	464	1918	26	72	1802	152	693	80	0	251	50	415
Confl. Peds. (#/hr)	3		1	1		3			2	2		
Heavy Vehicles (%)	0%	5%	1%	1%	3%	4%	1%	2%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Split	NA		Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases			2	6		6						4
Actuated Green, G (s)	13.0	48.0	48.0	47.0	41.0	41.0	31.0	31.0		23.0	23.0	23.0
Effective Green, g (s)	13.0	48.0	48.0	47.0	41.0	41.0	31.0	31.0		23.0	23.0	23.0
Actuated g/C Ratio	0.10	0.37	0.37	0.36	0.32	0.32	0.24	0.24		0.18	0.18	0.18
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	350	1824	582	140	1588	482	826	425		319	336	285
v/s Ratio Prot	c0.13	0.39		0.02	c0.36		c0.20	0.04		0.14	0.03	
v/s Ratio Perm			0.02	0.16		0.10						c0.26
v/c Ratio	1.33	1.05	0.04	0.51	1.13	0.32	0.84	0.19		0.79	0.15	1.46
Uniform Delay, d1	58.5	41.0	26.3	33.1	44.5	33.8	47.1	39.5		51.2	45.2	53.5
Progression Factor	1.20	0.46	0.28	1.14	0.70	0.49	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	160.2	33.2	0.1	1.0	63.5	0.5	7.5	0.2		12.1	0.2	224.2
Delay (s)	230.2	52.1	7.4	38.7	94.7	17.1	54.6	39.7		63.2	45.4	277.7
Level of Service	F	D	A	D	F	B	D	D		E	D	F
Approach Delay (s)		84.5			82.6			52.9			199.2	
Approach LOS		F			F			D			F	

Intersection Summary

HCM 2000 Control Delay	95.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	102.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	613	1438	145	55	1548	229	315	368	176	610
v/c Ratio	0.96	0.59	0.20	0.29	0.97	0.88	0.43	0.95	0.19	0.97
Control Delay	80.4	20.4	5.5	20.0	59.8	90.9	38.2	69.2	37.9	51.6
Queue Delay	0.0	0.2	0.0	0.0	41.8	0.0	0.0	0.0	0.0	4.2
Total Delay	80.4	20.6	5.5	20.0	101.6	90.9	38.2	69.2	37.9	55.8
Queue Length 50th (m)	91.0	63.6	5.8	6.7	~155.0	32.1	31.5	76.5	19.2	87.0
Queue Length 95th (m)	m89.4	m62.8	m5.9	13.4	#190.6	#55.8	46.3	#139.4	29.4	#166.7
Internal Link Dist (m)		141.6			238.0		219.7		226.0	
Turn Bay Length (m)	70.0		50.0	120.0		95.0		110.0		45.0
Base Capacity (vph)	639	2429	718	195	1592	261	781	388	964	648
Starvation Cap Reductn	0	302	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	311	0	0	0	0	20
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.68	0.20	0.28	1.21	0.88	0.40	0.95	0.18	0.97

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)	613	1438	145	55	1317	231	229	214	101	368	176	610
Future Volume (vph)	613	1438	145	55	1317	231	229	214	101	368	176	610
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91		0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3303	5085	1367	1703	4862		3467	3309		1686	3574	1524
Flt Permitted	0.95	1.00	1.00	0.16	1.00		0.95	1.00		0.41	1.00	1.00
Satd. Flow (perm)	3303	5085	1367	287	4862		3467	3309		723	3574	1524
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)	613	1438	145	55	1317	231	229	214	101	368	176	610
RTOR Reduction (vph)	0	0	67	0	19	0	0	44	0	0	0	242
Lane Group Flow (vph)	613	1438	78	55	1529	0	229	271	0	368	176	368
Confl. Peds. (#/hr)	1		4	4		1			1	1		
Heavy Vehicles (%)	6%	2%	16%	6%	2%	16%	1%	5%	0%	7%	1%	6%
Turn Type	Prot	NA	Perm	pm+pt	NA		Prot	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)	25.1	61.3	61.3	48.0	42.1		9.8	26.9		46.8	33.0	33.0
Effective Green, g (s)	25.1	61.3	61.3	48.0	42.1		9.8	26.9		46.8	33.0	33.0
Actuated g/C Ratio	0.19	0.47	0.47	0.37	0.32		0.08	0.21		0.36	0.25	0.25
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	6.0
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)	637	2397	644	170	1574		261	684		378	907	386
v/s Ratio Prot	c0.19	0.28		0.01	c0.31		0.07	0.08		c0.12	0.05	
v/s Ratio Perm			0.06	0.10						c0.23		0.24
v/c Ratio	0.96	0.60	0.12	0.32	0.97		0.88	0.40		0.97	0.19	0.95
Uniform Delay, d1	52.0	25.3	19.3	26.8	43.4		59.5	44.5		38.0	38.1	47.8
Progression Factor	1.38	0.78	1.06	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	9.9	0.3	0.1	1.1	16.8		26.4	0.4		39.0	0.1	33.8
Delay (s)	81.8	19.9	20.6	27.9	60.2		85.9	44.9		77.0	38.2	81.6
Level of Service	F	B	C	C	E		F	D		E	D	F
Approach Delay (s)		37.2			59.1			62.2			73.5	
Approach LOS		D			E			E			E	

Intersection Summary

HCM 2000 Control Delay	53.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	94.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	306	28	17	115	944	13	1146
v/c Ratio	0.66	0.17	0.05	0.36	0.41	0.03	0.59
Control Delay	30.4	33.8	15.4	9.0	9.8	6.5	16.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	30.4	33.8	15.4	9.0	9.8	6.5	16.7
Queue Length 50th (m)	17.9	4.8	0.2	7.5	44.4	0.8	83.0
Queue Length 95th (m)	33.4	12.3	6.1	16.2	88.1	3.1	120.3
Internal Link Dist (m)	115.4		50.9		226.0		199.1
Turn Bay Length (m)				70.0		50.0	
Base Capacity (vph)	758	166	417	345	2318	458	1953
Starvation Cap Reductn	0	0	0	0	0	0	145
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.17	0.04	0.33	0.41	0.03	0.63

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	163	1	142	28	1	16	115	915	29	13	982	164
Future Volume (vph)	163	1	142	28	1	16	115	915	29	13	982	164
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor		0.95		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt		0.93		1.00	0.86		1.00	1.00		1.00	0.98	
Flt Protected		0.97		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		3241		1442	1632		1656	3426		1805	3375	
Flt Permitted		0.81		0.32	1.00		0.17	1.00		0.30	1.00	
Satd. Flow (perm)		2688		488	1632		297	3426		562	3375	
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)	163	1	142	28	1	16	115	915	29	13	982	164
RTOR Reduction (vph)	0	125	0	0	13	0	0	1	0	0	9	0
Lane Group Flow (vph)	0	181	0	28	4	0	115	943	0	13	1137	0
Confl. Peds. (#/hr)			6	6			7		2	2		7
Heavy Vehicles (%)	0%	0%	0%	25%	0%	0%	9%	5%	0%	0%	5%	1%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		12.9		20.8	20.8		74.6	69.3		63.6	62.3	
Effective Green, g (s)		12.9		20.8	20.8		74.6	69.3		63.6	62.3	
Actuated g/C Ratio		0.12		0.19	0.19		0.69	0.65		0.59	0.58	
Clearance Time (s)		6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)		3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		322		129	316		311	2210		347	1957	
v/s Ratio Prot				c0.01	0.00		c0.03	0.28		0.00	c0.34	
v/s Ratio Perm		c0.07		0.03			0.23			0.02		
v/c Ratio		0.56		0.22	0.01		0.37	0.43		0.04	0.58	
Uniform Delay, d1		44.6		35.9	35.0		8.1	9.3		9.0	14.3	
Progression Factor		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.2		0.8	0.0		0.7	0.6		0.0	1.3	
Delay (s)		46.8		36.7	35.0		8.9	9.9		9.1	15.5	
Level of Service		D		D	D		A	A		A	B	
Approach Delay (s)		46.8			36.1			9.8			15.5	
Approach LOS		D			D			A			B	

Intersection Summary

HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	107.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	169	1	102	1	98	997	1230
v/c Ratio	0.65	0.00	0.40	0.00	0.28	0.39	0.55
Control Delay	49.3	35.0	12.4	0.0	5.7	5.6	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.3	35.0	12.4	0.0	5.7	5.6	12.0
Queue Length 50th (m)	30.8	0.2	0.0	0.0	3.2	26.1	59.2
Queue Length 95th (m)	52.7	1.6	14.0	0.0	12.3	63.5	122.3
Internal Link Dist (m)		62.1		66.5		199.1	252.7
Turn Bay Length (m)	25.0				70.0		
Base Capacity (vph)	262	483	389	519	384	2557	2217
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.00	0.26	0.00	0.26	0.39	0.55

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	169	1	102	0	0	1	98	996	1	0	1058	172
Future Volume (vph)	169	1	102	0	0	1	98	996	1	0	1058	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0		6.0		4.0	6.0			6.0	
Lane Util. Factor	1.00	1.00	1.00		1.00		1.00	0.95			0.95	
Frpb, ped/bikes	1.00	1.00	1.00		1.00		1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85		0.85		1.00	1.00			0.98	
Flt Protected	0.95	1.00	1.00		1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1770	1900	1233		1615		1805	3471			3463	
Flt Permitted	0.70	1.00	1.00		1.00		0.16	1.00			1.00	
Satd. Flow (perm)	1307	1900	1233		1615		295	3471			3463	
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)	169	1	102	0	0	1	98	996	1	0	1058	172
RTOR Reduction (vph)	0	0	84	0	1	0	0	0	0	0	8	0
Lane Group Flow (vph)	169	1	18	0	0	0	98	997	0	0	1222	0
Confl. Peds. (#/hr)							2		2	2		2
Heavy Vehicles (%)	2%	0%	31%	0%	0%	0%	0%	4%	0%	0%	2%	1%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	17.6	17.6	17.6		1.7		70.2	70.2			60.0	
Effective Green, g (s)	17.6	17.6	17.6		1.7		70.2	70.2			60.0	
Actuated g/C Ratio	0.18	0.18	0.18		0.02		0.70	0.70			0.60	
Clearance Time (s)	4.0	6.0	6.0		6.0		4.0	6.0			6.0	
Vehicle Extension (s)	3.0	3.0	3.0		3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	285	335	217		27		301	2441			2081	
v/s Ratio Prot	c0.07	0.00			0.00		0.02	c0.29			c0.35	
v/s Ratio Perm	c0.03		0.01				0.21					
v/c Ratio	0.59	0.00	0.08		0.00		0.33	0.41			0.59	
Uniform Delay, d1	37.4	33.9	34.4		48.2		7.3	6.2			12.3	
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00			1.00	
Incremental Delay, d2	3.3	0.0	0.2		0.0		0.6	0.5			1.2	
Delay (s)	40.7	33.9	34.5		48.2		8.0	6.7			13.5	
Level of Service	D	C	C		D		A	A			B	
Approach Delay (s)		38.4			48.2			6.8			13.5	
Approach LOS		D			D			A			B	

Intersection Summary

HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	99.8	Sum of lost time (s)	20.0
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	108	23	63	71	31	66	1047	89	1220
v/c Ratio	0.29	0.07	0.18	0.20	0.10	0.25	0.60	0.31	0.65
Control Delay	35.4	43.0	3.7	33.9	21.4	10.3	23.2	10.7	21.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.4	43.0	3.7	33.9	21.4	10.3	23.2	10.7	21.9
Queue Length 50th (m)	20.4	4.9	0.0	13.2	1.7	5.5	94.1	7.6	108.2
Queue Length 95th (m)	36.0	12.7	4.7	25.4	10.8	10.8	115.9	14.1	132.3
Internal Link Dist (m)		132.6			203.0		252.7		204.9
Turn Bay Length (m)	50.0		50.0	30.0		70.0		65.0	
Base Capacity (vph)	377	316	348	360	296	266	1737	288	1867
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	0.29	0.07	0.18	0.20	0.10	0.25	0.60	0.31	0.65

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	108	23	63	71	8	23	66	995	52	89	1096	124
Future Volume (vph)	108	23	63	71	8	23	66	995	52	89	1096	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.89		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1900	1593	1717	1664		1805	3466		1456	3487	
Flt Permitted	0.74	1.00	1.00	0.74	1.00		0.15	1.00		0.17	1.00	
Satd. Flow (perm)	1400	1900	1593	1342	1664		284	3466		259	3487	
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)	108	23	63	71	8	23	66	995	52	89	1096	124
RTOR Reduction (vph)	0	0	53	0	19	0	0	3	0	0	7	0
Lane Group Flow (vph)	108	23	11	71	12	0	66	1044	0	89	1213	0
Confl. Peds. (#/hr)			1	1			3		3	3		3
Heavy Vehicles (%)	0%	0%	0%	5%	0%	2%	0%	3%	8%	24%	2%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	28.0	20.0	20.0	28.0	20.0		68.0	60.0		76.0	64.0	
Effective Green, g (s)	28.0	20.0	20.0	28.0	20.0		68.0	60.0		76.0	64.0	
Actuated g/C Ratio	0.23	0.17	0.17	0.23	0.17		0.57	0.50		0.63	0.53	
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0		4.0	6.0		4.0	6.0	
Lane Grp Cap (vph)	353	316	265	338	277		262	1733		283	1859	
v/s Ratio Prot	c0.02	0.01		0.01	0.01		0.02	0.30		c0.03	c0.35	
v/s Ratio Perm	c0.05		0.01	0.04			0.13			0.17		
v/c Ratio	0.31	0.07	0.04	0.21	0.04		0.25	0.60		0.31	0.65	
Uniform Delay, d1	37.5	42.2	41.9	36.8	42.0		13.9	21.5		11.8	20.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.2	0.4	0.3	1.4	0.3		2.3	1.6		2.9	1.8	
Delay (s)	39.7	42.6	42.2	38.2	42.3		16.2	23.0		14.7	21.8	
Level of Service	D	D	D	D	D		B	C		B	C	
Approach Delay (s)		40.9			39.4			22.6			21.3	
Approach LOS		D			D			C			C	

Intersection Summary

HCM 2000 Control Delay	23.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	0	9	82	0	32	7	1121	20	8	1052	6
Future Volume (Veh/h)	25	0	9	82	0	32	7	1121	20	8	1052	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	25	0	9	82	0	32	7	1121	20	8	1052	6
Pedestrians					3						1	
Lane Width (m)					3.6						3.6	
Walking Speed (m/s)					1.2						1.2	
Percent Blockage					0						0	
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh)								2			2	
Upstream signal (m)								229				
pX, platoon unblocked	0.79	0.79		0.79	0.79	0.79				0.79		
vC, conflicting volume	1678	2229	529	1699	2222	574	1058			1144		
vC1, stage 1 conf vol	1071	1071		1148	1148							
vC2, stage 2 conf vol	608	1158		551	1074							
vCu, unblocked vol	1325	2023	529	1351	2014	0	1058			648		
tC, single (s)	7.5	6.5	6.9	7.6	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.6	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	89	100	98	70	100	96	99			99		
cM capacity (veh/h)	222	220	494	270	220	858	654			746		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	34	114	7	747	394	8	701	357
Volume Left	25	82	7	0	0	8	0	0
Volume Right	9	32	0	0	20	0	0	6
cSH	260	334	654	1700	1700	746	1700	1700
Volume to Capacity	0.13	0.34	0.01	0.44	0.23	0.01	0.41	0.21
Queue Length 95th (m)	3.6	11.8	0.3	0.0	0.0	0.3	0.0	0.0
Control Delay (s)	20.9	21.3	10.6	0.0	0.0	9.9	0.0	0.0
Lane LOS	C	C	B			A		
Approach Delay (s)	20.9	21.3	0.1			0.1		
Approach LOS	C	C						

Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	45.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	110	110	41	1135	957	28
Future Volume (Veh/h)	110	110	41	1135	957	28
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	110	110	41	1135	957	28
Pedestrians	1					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)					276	
pX, platoon unblocked	0.92	0.92	0.92			
vC, conflicting volume	1622	494	986			
vC1, stage 1 conf vol	972					
vC2, stage 2 conf vol	650					
vCu, unblocked vol	1495	264	801			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	64	84	95			
cM capacity (veh/h)	302	678	760			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	110	110	41	568	568	638	347
Volume Left	110	0	41	0	0	0	0
Volume Right	0	110	0	0	0	0	28
cSH	302	678	760	1700	1700	1700	1700
Volume to Capacity	0.36	0.16	0.05	0.33	0.33	0.38	0.20
Queue Length 95th (m)	12.9	4.6	1.4	0.0	0.0	0.0	0.0
Control Delay (s)	23.6	11.3	10.0	0.0	0.0	0.0	0.0
Lane LOS	C	B	B				
Approach Delay (s)	17.5		0.3			0.0	
Approach LOS	C						

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	46.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	35	27	10	1204	924	17
Future Volume (Veh/h)	35	27	10	1204	924	17
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	35	27	10	1204	924	17
Pedestrians	2					
Lane Width (m)	3.6					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (m)					122	
pX, platoon unblocked	0.90	0.90	0.90			
vC, conflicting volume	1556	472	943			
vC1, stage 1 conf vol	934					
vC2, stage 2 conf vol	622					
vCu, unblocked vol	1402	203	723			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	89	96	99			
cM capacity (veh/h)	328	731	801			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	62	10	602	602	616	325
Volume Left	35	10	0	0	0	0
Volume Right	27	0	0	0	0	17
cSH	431	801	1700	1700	1700	1700
Volume to Capacity	0.14	0.01	0.35	0.35	0.36	0.19
Queue Length 95th (m)	4.0	0.3	0.0	0.0	0.0	0.0
Control Delay (s)	14.7	9.5	0.0	0.0	0.0	0.0
Lane LOS	B	A				
Approach Delay (s)	14.7	0.1			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	219	861	227	311	589	228	443	795	176	395	240
v/c Ratio	0.75	0.85	0.43	0.95	0.53	0.39	0.92	0.75	0.67	0.56	0.51
Control Delay	37.5	49.2	16.5	69.6	36.1	15.2	52.8	40.6	35.9	46.6	9.2
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	37.5	49.2	16.5	69.6	36.1	15.2	52.8	40.6	35.9	46.6	9.2
Queue Length 50th (m)	32.5	105.7	17.0	59.2	63.4	16.7	80.7	88.2	26.5	46.8	0.0
Queue Length 95th (m)	#51.5	#132.3	40.8	#115.9	82.2	39.2	#130.5	112.6	42.5	63.7	22.8
Internal Link Dist (m)		844.2			279.6			97.5		104.6	
Turn Bay Length (m)	25.0		25.0	40.0		25.0	100.0		40.0		50.0
Base Capacity (vph)	299	1014	527	332	1118	589	481	1054	273	708	471
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	0.73	0.85	0.43	0.94	0.53	0.39	0.92	0.75	0.64	0.56	0.51

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)	219	861	227	311	589	228	443	550	245	176	395	240
Future Volume (vph)	219	861	227	311	589	228	443	550	245	176	395	240
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		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)	1253	3471	1476	1770	3574	1583	1735	3386		1770	3539	1396
Flt Permitted	0.32	1.00	1.00	0.11	1.00	1.00	0.32	1.00		0.24	1.00	1.00
Satd. Flow (perm)	427	3471	1476	204	3574	1583	592	3386		446	3539	1396
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)	219	861	227	311	589	228	443	550	245	176	395	240
RTOR Reduction (vph)	0	0	96	0	0	93	0	42	0	0	0	192
Lane Group Flow (vph)	219	861	131	311	589	135	443	753	0	176	395	48
Confl. Peds. (#/hr)			1	1			2					2
Heavy Vehicles (%)	44%	4%	8%	2%	1%	2%	4%	2%	1%	2%	2%	14%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	50.3	35.0	35.0	55.3	37.5	37.5	51.0	35.8		35.2	24.0	24.0
Effective Green, g (s)	50.3	35.0	35.0	55.3	37.5	37.5	51.0	35.8		35.2	24.0	24.0
Actuated g/C Ratio	0.42	0.29	0.29	0.46	0.31	0.31	0.43	0.30		0.29	0.20	0.20
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	6.0
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)	284	1014	431	326	1118	495	471	1011		254	708	279
v/s Ratio Prot	0.10	0.25		c0.14	0.16		c0.18	0.22		0.06	0.11	
v/s Ratio Perm	0.22		0.09	c0.30		0.08	c0.22			0.14		0.03
v/c Ratio	0.77	0.85	0.30	0.95	0.53	0.27	0.94	0.74		0.69	0.56	0.17
Uniform Delay, d1	24.9	39.9	32.9	34.3	33.9	30.9	27.7	37.9		33.5	43.1	39.7
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	12.2	6.8	0.4	37.5	0.5	0.3	27.1	5.0		7.9	3.2	1.3
Delay (s)	37.1	46.7	33.3	71.7	34.3	31.2	54.8	42.9		41.4	46.3	41.0
Level of Service	D	D	C	E	C	C	D	D		D	D	D
Approach Delay (s)		42.8			44.0			47.1			43.7	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	44.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	119.8	Sum of lost time (s)	20.0
Intersection Capacity Utilization	107.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	115	1442	220	1451	104	440	50	50
v/c Ratio	0.39	0.49	0.60	0.44	0.47	0.74	0.29	0.15
Control Delay	10.5	17.7	41.8	1.9	52.1	22.4	46.4	31.1
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	10.5	17.7	41.8	2.0	52.1	22.4	46.4	31.1
Queue Length 50th (m)	7.2	78.8	28.5	7.3	24.4	14.7	11.4	3.2
Queue Length 95th (m)	15.2	116.7	57.2	8.5	39.7	31.7	22.0	9.4
Internal Link Dist (m)		279.3		65.0		101.6		166.7
Turn Bay Length (m)	60.0		50.0		45.0		50.0	
Base Capacity (vph)	334	2936	451	3328	220	916	177	692
Starvation Cap Reductn	0	0	0	462	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	0.34	0.49	0.49	0.51	0.47	0.48	0.28	0.07

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	1323	119	220	1437	14	104	107	333	50	24	26
Future Volume (vph)	115	1323	119	220	1437	14	104	107	333	50	24	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.89		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	4977		1769	5126		1792	3144		1787	3237	
Flt Permitted	0.16	1.00		0.13	1.00		0.58	1.00		0.40	1.00	
Satd. Flow (perm)	299	4977		238	5126		1091	3144		752	3237	
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	1323	119	220	1437	14	104	107	333	50	24	26
RTOR Reduction (vph)	0	5	0	0	0	0	0	301	0	0	24	0
Lane Group Flow (vph)	115	1437	0	220	1451	0	104	139	0	50	26	0
Confl. Peds. (#/hr)	8		7	7		8	10		1	1		10
Heavy Vehicles (%)	0%	3%	0%	2%	1%	4%	0%	0%	1%	1%	3%	0%
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	83.4	75.4		95.2	83.2		21.3	12.5		16.3	10.0	
Effective Green, g (s)	83.4	75.4		95.2	83.2		21.3	12.5		16.3	10.0	
Actuated g/C Ratio	0.64	0.58		0.73	0.64		0.16	0.10		0.13	0.08	
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	284	2886		360	3280		226	302		144	249	
v/s Ratio Prot	0.02	0.29		c0.07	0.28		c0.03	c0.04		0.02	0.01	
v/s Ratio Perm	0.23			c0.37			0.04			0.03		
v/c Ratio	0.40	0.50		0.61	0.44		0.46	0.46		0.35	0.10	
Uniform Delay, d1	9.1	16.1		10.5	11.7		48.3	55.6		51.3	55.8	
Progression Factor	1.00	1.00		3.87	0.14		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.6		2.3	0.3		1.5	1.1		1.5	0.2	
Delay (s)	10.1	16.7		43.1	1.9		49.8	56.7		52.8	56.0	
Level of Service	B	B		D	A		D	E		D	E	
Approach Delay (s)		16.2			7.3			55.4			54.4	
Approach LOS		B			A			E			D	

Intersection Summary			
HCM 2000 Control Delay	18.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	77.0%	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)	6	866	5	144	871	129	72	389	278	384	367	104
v/c Ratio	0.04	0.58	0.01	0.85	0.58	0.17	0.16	0.23	0.35	0.86	0.22	0.13
Control Delay	21.2	28.2	0.0	71.9	28.2	4.5	19.1	19.0	15.8	49.0	18.9	7.2
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	21.2	28.2	0.0	71.9	28.2	4.5	19.1	19.0	15.8	49.0	18.9	7.2
Queue Length 50th (m)	0.9	84.5	0.0	31.4	85.2	0.6	9.9	29.1	30.5	82.5	27.2	4.3
Queue Length 95th (m)	3.8	105.3	0.0	#73.0	106.0	12.3	19.6	39.7	51.1	#145.7	37.6	14.2
Internal Link Dist (m)		259.3			844.2			279.0			144.9	
Turn Bay Length (m)	60.0		60.0	60.0		60.0	60.0		60.0	60.0		60.0
Base Capacity (vph)	168	1504	688	170	1504	744	458	1681	789	445	1681	789
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	0.04	0.58	0.01	0.85	0.58	0.17	0.16	0.23	0.35	0.86	0.22	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)	6	866	5	144	871	129	72	389	278	384	367	104
Future Volume (vph)	6	866	5	144	871	129	72	389	278	384	367	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	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)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.21	1.00	1.00	0.22	1.00	1.00	0.52	1.00	1.00	0.50	1.00	1.00
Satd. Flow (perm)	398	3539	1583	402	3539	1583	966	3539	1583	937	3539	1583
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)	6	866	5	144	871	129	72	389	278	384	367	104
RTOR Reduction (vph)	0	0	3	0	0	72	0	0	38	0	0	37
Lane Group Flow (vph)	6	866	2	144	871	57	72	389	240	384	367	67
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	51.0	51.0	51.0	51.0	51.0	51.0	57.0	57.0	57.0	57.0	57.0	57.0
Effective Green, g (s)	51.0	51.0	51.0	51.0	51.0	51.0	57.0	57.0	57.0	57.0	57.0	57.0
Actuated g/C Ratio	0.42	0.42	0.42	0.42	0.42	0.42	0.48	0.48	0.48	0.48	0.48	0.48
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Grp Cap (vph)	169	1504	672	170	1504	672	458	1681	751	445	1681	751
v/s Ratio Prot		0.24			0.25			0.11			0.10	
v/s Ratio Perm	0.02		0.00	c0.36		0.04	0.07		0.15	c0.41		0.04
v/c Ratio	0.04	0.58	0.00	0.85	0.58	0.09	0.16	0.23	0.32	0.86	0.22	0.09
Uniform Delay, d1	20.1	26.3	19.9	31.0	26.3	20.6	17.9	18.6	19.5	28.0	18.5	17.3
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	0.4	1.6	0.0	37.8	1.6	0.2	0.7	0.3	1.1	19.4	0.3	0.2
Delay (s)	20.5	27.9	19.9	68.8	27.9	20.8	18.6	18.9	20.6	47.4	18.7	17.5
Level of Service	C	C	B	E	C	C	B	B	C	D	B	B
Approach Delay (s)		27.8			32.3			19.5			31.5	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	28.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	B38	B38	B38	WB	WB	WB	WB
Directions Served	L	T	T	T	TR	T	T	T	L	L	T	T
Maximum Queue (m)	77.4	111.6	115.4	103.3	106.4	81.5	88.8	70.2	64.9	67.9	69.1	95.1
Average Queue (m)	35.6	91.2	92.6	79.3	70.2	25.4	28.0	20.2	33.1	39.6	24.8	36.9
95th Queue (m)	89.4	126.8	125.8	112.9	108.4	80.8	87.9	73.0	53.9	59.6	57.0	78.2
Link Distance (m)		86.8	86.8	86.8	86.8	65.4	65.4	65.4			114.0	114.0
Upstream Blk Time (%)		34	32	9	9	4	4	3				
Queuing Penalty (veh)		143	137	39	37	21	25	17				
Storage Bay Dist (m)	70.0								65.0	65.0		
Storage Blk Time (%)	0	42							0	1	0	
Queuing Penalty (veh)	0	21							2	4	1	

Intersection: 3: Walmart Plaza D/W/Barrie View Drive & Mapleview Drive W

Movement	WB	NB	NB	NB	SB	SB	SB
Directions Served	TR	L	T	R	L	T	TR
Maximum Queue (m)	98.7	34.7	52.3	90.7	47.4	188.9	146.4
Average Queue (m)	47.5	10.6	21.1	79.8	46.4	128.1	20.3
95th Queue (m)	87.6	26.5	41.1	110.1	53.4	228.8	83.4
Link Distance (m)	114.0		86.1	86.1		180.4	180.4
Upstream Blk Time (%)	0			54		24	0
Queuing Penalty (veh)	0			0		0	0
Storage Bay Dist (m)		20.0			40.0		
Storage Blk Time (%)		5	21		73	2	
Queuing Penalty (veh)		5	12		7	5	

Intersection: 6: Mapleview Drive W & Highway 400 SB Off-Ramp

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	T	R	L	T	T	T	L	L	R
Maximum Queue (m)	122.6	125.8	122.7	123.6	85.0	123.4	84.6	82.7	84.8	307.4	358.2	356.6
Average Queue (m)	99.6	103.1	84.4	76.4	19.6	63.6	37.6	37.8	46.6	284.5	318.5	229.3
95th Queue (m)	135.4	137.4	132.2	121.7	66.0	114.4	74.5	69.6	76.6	347.1	398.7	458.0
Link Distance (m)	114.0	114.0	114.0	114.0			168.4	168.4	168.4		326.9	326.9
Upstream Blk Time (%)	5	6	1	1			0	0	0		57	26
Queuing Penalty (veh)	32	38	8	4			3	3	3		0	0
Storage Bay Dist (m)					45.0	135.0				300.0		
Storage Blk Time (%)				27		1	1			17	60	31
Queuing Penalty (veh)				51		5	3			57	202	42

Intersection: 6: Mapleview Drive W & Highway 400 SB Off-Ramp

Movement	SB	B36	B36
Directions Served	R	T	T
Maximum Queue (m)	307.5	191.9	191.1
Average Queue (m)	149.0	97.9	94.1
95th Queue (m)	375.7	235.5	232.2
Link Distance (m)		176.9	176.9
Upstream Blk Time (%)		34	30
Queuing Penalty (veh)		0	0
Storage Bay Dist (m)	300.0		
Storage Blk Time (%)	0		
Queuing Penalty (veh)	0		

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (m)	128.0	161.9	179.9	176.8	160.2	124.9	96.1	93.0	133.8	151.9	224.5	270.3
Average Queue (m)	77.9	83.6	93.2	65.7	59.4	68.7	46.4	48.5	91.6	56.8	63.9	108.8
95th Queue (m)	145.5	158.8	199.3	155.5	131.4	109.4	79.6	76.2	130.2	112.0	153.1	227.1
Link Distance (m)		168.4	168.4	168.4	168.4	218.3	218.3	218.3			335.8	335.8
Upstream Blk Time (%)		1	5	0	0	0					1	1
Queuing Penalty (veh)		5	36	3	1	1					0	0
Storage Bay Dist (m)	130.0								130.0	265.0		
Storage Blk Time (%)	2	3							1	0	0	4
Queuing Penalty (veh)	6	11							9	0	0	11

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	NB
Directions Served	R
Maximum Queue (m)	219.6
Average Queue (m)	90.3
95th Queue (m)	197.9
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	265.0
Storage Blk Time (%)	0
Queuing Penalty (veh)	1

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	L
Maximum Queue (m)	177.4	194.9	230.0	217.7	217.5	53.3	57.3	132.8	130.6	143.7	167.3	57.4
Average Queue (m)	142.2	154.0	158.4	91.8	97.6	5.5	16.8	70.4	99.0	120.8	94.3	55.4
95th Queue (m)	214.6	233.1	269.8	172.3	172.0	34.0	45.5	116.3	145.7	154.7	209.1	66.7
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)			16	1	0			0	0	6	12	
Queuing Penalty (veh)			146	9	3			1	1	34	65	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)	32	44	2		0		0	21				10
Queuing Penalty (veh)	205	284	11		0		0	15				35

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R
Maximum Queue (m)	138.6	124.4	67.2	100.6	100.6
Average Queue (m)	125.7	60.1	45.7	61.4	100.5
95th Queue (m)	156.4	154.3	72.7	134.9	101.6
Link Distance (m)	128.7	128.7		96.0	96.0
Upstream Blk Time (%)	49	7		14	91
Queuing Penalty (veh)	0	0		0	0
Storage Bay Dist (m)			60.0		
Storage Blk Time (%)	58		17		
Queuing Penalty (veh)	199		8		

Intersection: 15: Bayview Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	T	R	L	T	T	TR	L	L
Maximum Queue (m)	82.4	94.6	115.1	76.5	64.3	36.0	27.9	249.5	256.2	260.0	97.5	102.1
Average Queue (m)	65.0	69.9	42.2	39.3	40.0	12.2	7.7	142.1	242.5	251.0	45.0	60.2
95th Queue (m)	90.2	99.7	92.2	68.1	60.1	27.6	19.9	290.9	283.6	256.3	91.3	102.7
Link Distance (m)			131.2	131.2	131.2			244.4	244.4	244.4		
Upstream Blk Time (%)			1	0				5	41	94		
Queuing Penalty (veh)			8	0				0	0	0		
Storage Bay Dist (m)	70.0	70.0				50.0	120.0				95.0	95.0
Storage Blk Time (%)	12	21	0		5	0		0			0	4
Queuing Penalty (veh)	56	100	0		7	0		0			0	5

Intersection: 15: Bayview Drive & Mapleview Drive W

Movement	NB	NB	SB	SB	SB	SB
Directions Served	T	TR	L	T	T	R
Maximum Queue (m)	89.2	58.1	117.5	219.6	218.1	80.0
Average Queue (m)	36.6	32.0	117.4	209.9	94.9	62.1
95th Queue (m)	69.5	54.8	117.7	238.3	226.5	99.0
Link Distance (m)	218.2	218.2		214.5	214.5	
Upstream Blk Time (%)				36	1	
Queuing Penalty (veh)				210	5	
Storage Bay Dist (m)			110.0			45.0
Storage Blk Time (%)	0		89	5	0	29
Queuing Penalty (veh)	0		78	20	0	25

Intersection: 18: Bayview Drive & South Village Way/Barrie Molson Centre D/W

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LT	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	73.7	64.4	35.7	12.6	71.5	92.7	93.4	57.2	193.5	204.7
Average Queue (m)	32.6	25.5	9.9	3.0	19.7	31.8	34.5	7.5	109.0	122.4
95th Queue (m)	57.2	54.5	26.1	10.3	43.5	72.9	75.9	35.5	218.6	218.6
Link Distance (m)	126.0	126.0	60.2	60.2		214.5	214.5		195.2	195.2
Upstream Blk Time (%)									13	7
Queuing Penalty (veh)									73	43
Storage Bay Dist (m)					70.0			50.0		
Storage Blk Time (%)					0	1		0	50	
Queuing Penalty (veh)					0	1		0	7	

Intersection: 21: Bayview Drive & North Village Way/Private D/W

Movement	EB	EB	EB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	R	TR	L	T	TR	T	TR
Maximum Queue (m)	43.4	32.0	65.2	6.5	29.0	57.0	51.6	201.2	204.6
Average Queue (m)	26.9	4.6	24.8	0.4	12.2	18.2	18.4	82.8	101.4
95th Queue (m)	44.1	32.6	55.6	3.3	24.4	42.9	42.5	226.3	235.7
Link Distance (m)		71.5	71.5	75.9		195.2	195.2	247.7	247.7
Upstream Blk Time (%)		1	3					4	5
Queuing Penalty (veh)		0	0					22	30
Storage Bay Dist (m)	25.0				70.0				
Storage Blk Time (%)	18					0		20	
Queuing Penalty (veh)	0					0		0	

Intersection: 24: Bayview Drive & Concert Way/Churchill Drive

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	40.5	31.5	24.5	33.8	23.9	77.1	96.9	105.3	72.2	173.8	180.0
Average Queue (m)	17.9	6.6	9.0	14.9	5.7	11.9	59.1	61.2	19.8	87.8	103.3
95th Queue (m)	34.2	19.9	19.7	29.7	16.1	37.9	92.4	95.8	52.5	171.2	176.5
Link Distance (m)		140.4			212.1		247.7	247.7		206.2	206.2
Upstream Blk Time (%)										2	3
Queuing Penalty (veh)										10	15
Storage Bay Dist (m)	50.0		50.0	30.0		70.0			65.0		
Storage Blk Time (%)	0	0		3			3		0	12	
Queuing Penalty (veh)	0	0		1			2		0	11	

Intersection: 28: Bayview Drive & Industrial Site D/W South/Coca-Cola D/W

Movement	EB	WB	NB	NB	NB	SB	SB	SB
Directions Served	LTR	LTR	L	T	TR	L	T	TR
Maximum Queue (m)	30.4	97.2	8.1	18.1	9.9	7.9	50.6	57.1
Average Queue (m)	8.7	45.0	0.6	0.8	0.5	0.7	3.4	4.5
95th Queue (m)	23.5	90.4	4.1	7.9	5.0	4.4	27.0	31.5
Link Distance (m)	196.7	182.1		206.2	206.2		206.3	206.3
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)			15.0			15.0		
Storage Blk Time (%)				0			2	
Queuing Penalty (veh)				0			0	

Intersection: 29: Bayview Drive & Medical Centre South D/W - Industrial Site D/W North

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (m)	99.9	77.7	22.3	179.2	169.8	2.4	4.0
Average Queue (m)	49.3	32.4	7.6	50.1	37.8	0.1	0.2
95th Queue (m)	107.2	95.3	21.1	157.0	137.4	1.7	1.9
Link Distance (m)	102.1	102.1		206.3	206.3	137.8	137.8
Upstream Blk Time (%)	22	19		1	0		
Queuing Penalty (veh)	0	0		4	1		
Storage Bay Dist (m)			15.0				
Storage Blk Time (%)			1	26			
Queuing Penalty (veh)			3	11			

Intersection: 31: Bayview Drive & Medical Centre North D/W

Movement	EB	NB	NB	NB
Directions Served	LR	L	T	T
Maximum Queue (m)	112.4	19.7	149.5	145.5
Average Queue (m)	80.6	2.2	100.3	89.7
95th Queue (m)	142.6	10.5	191.4	186.0
Link Distance (m)	108.5		137.8	137.8
Upstream Blk Time (%)	50		19	7
Queuing Penalty (veh)	0		119	41
Storage Bay Dist (m)		15.0		
Storage Blk Time (%)		0	53	
Queuing Penalty (veh)		2	5	

Intersection: 33: Bayview Drive & Big Bay Point Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	T	R	L	T	TR	L
Maximum Queue (m)	75.0	319.8	314.8	75.0	94.9	172.9	165.9	74.0	92.3	113.4	102.3	76.9
Average Queue (m)	68.2	193.5	187.1	60.1	72.5	83.5	67.0	19.3	87.0	98.6	82.6	44.1
95th Queue (m)	91.9	380.4	378.6	101.6	107.3	163.0	138.7	47.2	106.6	118.1	115.5	77.2
Link Distance (m)		835.5	835.5			287.9	287.9			92.4	92.4	
Upstream Blk Time (%)									15	45	25	0
Queuing Penalty (veh)									0	281	153	0
Storage Bay Dist (m)	25.0			25.0	40.0			25.0	100.0			40.0
Storage Blk Time (%)	57	63	66	8	60	21	35	1	15	45		30
Queuing Penalty (veh)	244	139	150	34	176	64	79	2	40	201		59

Intersection: 33: Bayview Drive & Big Bay Point Road

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (m)	84.8	68.7	58.8
Average Queue (m)	45.2	37.7	28.6
95th Queue (m)	71.9	59.0	51.2
Link Distance (m)	101.3	101.3	
Upstream Blk Time (%)	0	0	
Queuing Penalty (veh)	0	0	
Storage Bay Dist (m)			50.0
Storage Blk Time (%)	13	3	1
Queuing Penalty (veh)	23	8	2

Intersection: 37: Bend

Movement	NB
Directions Served	T
Maximum Queue (m)	23.0
Average Queue (m)	0.8
95th Queue (m)	16.2
Link Distance (m)	101.3
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 39: Bryne Drive & Mapleview Drive W

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	B42
Directions Served	L	T	T	TR	L	T	T	TR	L	T	TR	T
Maximum Queue (m)	67.4	121.9	129.9	123.0	55.6	51.9	50.4	32.5	40.8	42.9	100.7	9.5
Average Queue (m)	26.5	66.3	76.1	64.2	36.2	8.7	8.4	5.2	19.8	19.6	49.7	0.9
95th Queue (m)	60.0	123.2	128.8	116.9	56.1	33.2	26.3	18.1	36.9	37.1	86.6	11.4
Link Distance (m)		286.6	286.6	286.6		65.4	65.4	65.4		97.4	97.4	42.8
Upstream Blk Time (%)						1	0				1	0
Queuing Penalty (veh)						5	0				0	0
Storage Bay Dist (m)	60.0				50.0				45.0			
Storage Blk Time (%)	0	12			6	0			0	0		
Queuing Penalty (veh)	0	14			26	1			0	0		

Intersection: 39: Bryne Drive & Mapleview Drive W

Movement	SB	SB	SB
Directions Served	L	T	TR
Maximum Queue (m)	27.1	20.4	15.2
Average Queue (m)	12.3	6.0	4.4
95th Queue (m)	24.0	15.9	11.3
Link Distance (m)		172.2	172.2
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)	50.0		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 43: Bryne Road & Harvie Road/Big Bay Point Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	R
Maximum Queue (m)	37.4	116.1	104.3	7.2	80.0	209.0	210.6	66.7	36.1	56.2	48.0	59.8
Average Queue (m)	2.3	70.0	60.2	0.5	69.2	119.9	111.3	12.3	14.5	33.4	21.6	26.1
95th Queue (m)	18.0	101.6	91.2	4.0	96.1	229.5	218.9	36.8	27.5	50.7	40.6	48.7
Link Distance (m)		266.9	266.9			835.5	835.5			283.7	283.7	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (m)	60.0			60.0	60.0			60.0	60.0			60.0
Storage Blk Time (%)		13	6		68	2	5			0	0	0
Queuing Penalty (veh)		1	0		295	3	7			0	0	0

Intersection: 43: Bryne Road & Harvie Road/Big Bay Point Road

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (m)	80.0	165.7	149.0	48.9
Average Queue (m)	79.6	152.9	96.4	15.8
95th Queue (m)	83.6	181.0	172.0	35.9
Link Distance (m)		149.6	149.6	
Upstream Blk Time (%)		90	0	
Queuing Penalty (veh)		0	0	
Storage Bay Dist (m)	60.0			60.0
Storage Blk Time (%)	92	0	2	
Queuing Penalty (veh)	168	0	2	

Network Summary

Network wide Queuing Penalty: 5121

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	683	2169	1946	1079	495	602
v/c Ratio	0.90	0.63	0.88	0.68	0.65	0.92
Control Delay	41.5	12.5	25.5	4.7	50.1	64.6
Queue Delay	0.0	3.2	0.1	0.0	0.4	0.0
Total Delay	41.5	15.7	25.6	4.7	50.5	64.6
Queue Length 50th (m)	71.5	173.9	118.7	31.9	62.2	82.0
Queue Length 95th (m)	m#96.3	187.9	m114.5	m30.7	81.2	#118.5
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	792	3448	2200	1583	792	676
Starvation Cap Reductn	0	1149	0	0	0	0
Spillback Cap Reductn	0	0	13	0	57	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.94	0.89	0.68	0.67	0.89

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)	683	2169	0	0	1946	1079	495	0	602	0	0	0
Future Volume (vph)	683	2169	0	0	1946	1079	495	0	602	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0			6.0	4.0	6.0		6.0			
Lane Util. Factor	0.97	0.91			0.91	1.00	0.97		0.88			
Frpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00			
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00		1.00			
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)	3433	5036			5085	1583	3433		2733			
Flt Permitted	0.95	1.00			1.00	1.00	0.95		1.00			
Satd. Flow (perm)	3433	5036			5085	1583	3433		2733			
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)	683	2169	0	0	1946	1079	495	0	602	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	46	0	0	0
Lane Group Flow (vph)	683	2169	0	0	1946	1079	495	0	556	0	0	0
Confl. Peds. (#/hr)			3	3								
Heavy Vehicles (%)	2%	3%	0%	0%	2%	2%	2%	0%	4%	0%	0%	0%
Turn Type	Prot	NA			NA	Free	Prot		Perm			
Protected Phases	5	2			6		8					
Permitted Phases						Free			8			
Actuated Green, G (s)	28.8	89.0			56.2	130.0	29.0		29.0			
Effective Green, g (s)	28.8	89.0			56.2	130.0	29.0		29.0			
Actuated g/C Ratio	0.22	0.68			0.43	1.00	0.22		0.22			
Clearance Time (s)	4.0	6.0			6.0		6.0		6.0			
Vehicle Extension (s)	3.0	3.0			3.0		3.0		3.0			
Lane Grp Cap (vph)	760	3447			2198	1583	765		609			
v/s Ratio Prot	c0.20	0.43			c0.38		0.14					
v/s Ratio Perm						0.68			c0.20			
v/c Ratio	0.90	0.63			0.89	0.68	0.65		0.91			
Uniform Delay, d1	49.2	11.4			33.9	0.0	45.9		49.3			
Progression Factor	0.64	1.03			0.71	1.00	1.00		1.00			
Incremental Delay, d2	7.8	0.5			0.6	0.2	1.9		18.2			
Delay (s)	39.6	12.2			24.7	0.2	47.7		67.4			
Level of Service	D	B			C	A	D		E			
Approach Delay (s)		18.7			16.0			58.6			0.0	
Approach LOS		B			B			E			A	

Intersection Summary

HCM 2000 Control Delay	23.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	89.6%	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	SBR
Lane Group Flow (vph)	464	1918	70	72	1802	282	693	91	251	50	533
v/c Ratio	0.95	0.88	0.09	0.45	1.05	0.43	1.00	0.25	0.93	0.18	0.90
Control Delay	86.8	21.1	0.3	24.8	56.2	4.5	86.0	38.9	95.1	50.2	55.4
Queue Delay	0.0	0.0	0.0	0.0	20.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.8	21.1	0.3	24.8	76.4	4.5	86.0	38.9	95.1	50.2	55.4
Queue Length 50th (m)	60.3	175.2	0.3	6.4	~187.1	3.9	97.2	17.5	67.7	11.9	120.6
Queue Length 95th (m)	m#93.7	187.3	m0.2	m7.4	m#216.4	m5.1	#139.2	34.0	#119.7	24.5	#190.2
Internal Link Dist (m)		225.6			141.6			127.2		94.6	
Turn Bay Length (m)	160.0		175.0	50.0			50.0		60.0		
Base Capacity (vph)	487	2183	758	163	1723	653	693	368	270	285	590
Starvation Cap Reductn	0	0	0	0	78	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	0.95	0.88	0.09	0.44	1.10	0.43	1.00	0.25	0.93	0.18	0.90

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)	464	1918	70	72	1802	282	693	65	26	251	50	533
Future Volume (vph)	464	1918	70	72	1802	282	693	65	26	251	50	533
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		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)	3502	4940	1578	1787	5036	1529	3467	1786		1805	1900	1615
Flt Permitted	0.95	1.00	1.00	0.09	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	4940	1578	169	5036	1529	3467	1786		1805	1900	1615
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)	464	1918	70	72	1802	282	693	65	26	251	50	533
RTOR Reduction (vph)	0	0	39	0	0	130	0	11	0	0	0	54
Lane Group Flow (vph)	464	1918	31	72	1802	152	693	80	0	251	50	479
Confl. Peds. (#/hr)	3		1	1		3			2	2		
Heavy Vehicles (%)	0%	5%	1%	1%	3%	4%	1%	2%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	pm+pt	NA	Perm	Split	NA		Split	NA	pm+ov
Protected Phases	5	2		1	6		3	3		4	4	5
Permitted Phases			2	6		6						4
Actuated Green, G (s)	18.1	56.7	56.7	50.4	44.5	44.5	26.0	26.0		19.4	19.4	37.5
Effective Green, g (s)	18.1	56.7	56.7	50.4	44.5	44.5	26.0	26.0		19.4	19.4	37.5
Actuated g/C Ratio	0.14	0.44	0.44	0.39	0.34	0.34	0.20	0.20		0.15	0.15	0.29
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0		6.0	6.0	4.0
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)	487	2154	688	138	1723	523	693	357		269	283	465
v/s Ratio Prot	0.13	0.39		0.02	c0.36		c0.20	0.04		0.14	0.03	c0.14
v/s Ratio Perm			0.02	0.18		0.10						0.15
v/c Ratio	0.95	0.89	0.04	0.52	1.05	0.29	1.00	0.22		0.93	0.18	1.03
Uniform Delay, d1	55.5	33.8	21.1	29.1	42.8	31.2	52.0	43.5		54.7	48.3	46.2
Progression Factor	1.13	0.49	0.12	1.20	0.65	0.36	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	24.7	4.5	0.1	1.5	27.9	0.6	34.2	0.3		37.1	0.3	49.6
Delay (s)	87.4	21.1	2.6	36.5	55.5	11.9	86.2	43.9		91.8	48.6	95.9
Level of Service	F	C	A	D	E	B	F	D		F	D	F
Approach Delay (s)		33.1			49.2			81.3			91.8	
Approach LOS		C			D			F			F	

Intersection Summary

HCM 2000 Control Delay	52.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	100.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	L	T	T	T	T	T	T	R	L	L	R
Maximum Queue (m)	94.9	101.8	137.2	100.7	93.8	168.0	124.4	82.2	97.4	82.9	81.9	105.8
Average Queue (m)	50.4	49.2	33.8	22.7	26.5	83.9	52.9	51.7	43.4	51.3	52.3	70.6
95th Queue (m)	83.9	87.0	101.5	70.5	72.1	139.0	91.1	74.1	79.4	78.0	77.8	97.5
Link Distance (m)		168.4	168.4	168.4	168.4	218.3	218.3	218.3			335.8	335.8
Upstream Blk Time (%)			0									
Queuing Penalty (veh)			0									
Storage Bay Dist (m)	130.0								130.0	265.0		
Storage Blk Time (%)	0	0										
Queuing Penalty (veh)	0	0										

Intersection: 9: Highway 400 NB Off-Ramp & Mapleview Drive W

Movement	NB
Directions Served	R
Maximum Queue (m)	96.3
Average Queue (m)	55.9
95th Queue (m)	84.5
Link Distance (m)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	265.0
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	L
Maximum Queue (m)	124.8	139.1	148.7	108.4	123.8	9.9	52.1	133.5	133.7	140.6	163.6	57.4
Average Queue (m)	65.1	70.5	65.5	52.6	60.1	3.5	14.1	68.7	83.5	104.0	57.9	56.0
95th Queue (m)	120.7	127.0	122.3	91.6	99.8	9.8	36.7	123.1	141.2	153.8	161.0	63.2
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)								0	0	3	4	
Queuing Penalty (veh)								1	2	17	19	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)	0	1	0					14				17
Queuing Penalty (veh)	2	7	0					10				59

Intersection: 12: Costco D/W/Park Place Boulevard & Mapleview Drive W

Movement	NB	NB	SB	SB	SB
Directions Served	L	TR	L	T	R
Maximum Queue (m)	141.5	134.5	67.4	100.6	100.6
Average Queue (m)	133.7	81.3	57.8	66.0	96.9
95th Queue (m)	137.3	176.5	79.7	135.0	115.1
Link Distance (m)	128.7	128.7		96.0	96.0
Upstream Blk Time (%)	81	17		17	63
Queuing Penalty (veh)	0	0		0	0
Storage Bay Dist (m)			60.0		
Storage Blk Time (%)	72		38		
Queuing Penalty (veh)	251		19		

HCM Signalized Intersection Capacity Analysis
1: West Terminal

07-25-2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	1966	0	0	2180	0	0	0	0
Future Volume (vph)	0	0	0	0	1966	0	0	2180	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					6.0			6.0				
Lane Util. Factor					0.91			0.91				
Frt					1.00			1.00				
Flt Protected					1.00			1.00				
Satd. Flow (prot)					5193			5142				
Flt Permitted					1.00			1.00				
Satd. Flow (perm)					5193			5142				
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	0	1966	0	0	2180	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1966	0	0	2180	0	0	0	0
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	2%	0%	0%	0%	0%
Turn Type					NA			NA				
Protected Phases					6			8				
Permitted Phases												
Actuated Green, G (s)					56.0			62.0				
Effective Green, g (s)					56.0			62.0				
Actuated g/C Ratio					0.43			0.48				
Clearance Time (s)					6.0			6.0				
Vehicle Extension (s)					3.0			3.0				
Lane Grp Cap (vph)					2236			2452				
v/s Ratio Prot					c0.38			c0.42				
v/s Ratio Perm												
v/c Ratio					0.88			0.89				
Uniform Delay, d1					33.9			30.9				
Progression Factor					0.70			1.00				
Incremental Delay, d2					3.5			4.4				
Delay (s)					27.3			35.2				
Level of Service					C			D				
Approach Delay (s)		0.0			27.3			35.2			0.0	
Approach LOS		A			C			D			A	

Intersection Summary			
HCM 2000 Control Delay	31.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	90.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
2: W-N & N-E

07-25-2022

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	2180	0	0	673	0
Future Volume (vph)	0	2180	0	0	673	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0	
Lane Util. Factor		0.91			0.97	
Frt		1.00			1.00	
Flt Protected		1.00			0.95	
Satd. Flow (prot)		5142			3404	
Flt Permitted		1.00			0.95	
Satd. Flow (perm)		5142			3404	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	2180	0	0	673	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	2180	0	0	673	0
Heavy Vehicles (%)	0%	2%	0%	0%	4%	0%
Turn Type		NA			Prot	
Protected Phases		4			6	
Permitted Phases						
Actuated Green, G (s)		62.0			56.0	
Effective Green, g (s)		62.0			56.0	
Actuated g/C Ratio		0.48			0.43	
Clearance Time (s)		6.0			6.0	
Vehicle Extension (s)		3.0			3.0	
Lane Grp Cap (vph)		2452			1466	
v/s Ratio Prot		c0.42			c0.20	
v/s Ratio Perm						
v/c Ratio		0.89			0.46	
Uniform Delay, d1		30.9			26.3	
Progression Factor		0.00			1.00	
Incremental Delay, d2		2.4			1.0	
Delay (s)		2.5			27.3	
Level of Service		A			C	
Approach Delay (s)		2.5	0.0		27.3	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	8.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	69.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
3: East Terminal

07-25-2022

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Traffic Volume (vph)	0	2169	0	0	0	0	0	0	0	0	1946	0
Future Volume (vph)	0	2169	0	0	0	0	0	0	0	0	1946	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0									6.0	
Lane Util. Factor		0.91									0.91	
Frt		1.00									1.00	
Flt Protected		1.00									1.00	
Satd. Flow (prot)		5092									5142	
Flt Permitted		1.00									1.00	
Satd. Flow (perm)		5092									5142	
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	2169	0	0	0	0	0	0	0	0	1946	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	2169	0	0	0	0	0	0	0	0	1946	0
Heavy Vehicles (%)	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%
Turn Type		NA									NA	
Protected Phases		4									2	
Permitted Phases												
Actuated Green, G (s)		61.2									56.8	
Effective Green, g (s)		61.2									56.8	
Actuated g/C Ratio		0.47									0.44	
Clearance Time (s)		6.0									6.0	
Vehicle Extension (s)		3.0									3.0	
Lane Grp Cap (vph)		2397									2246	
v/s Ratio Prot		c0.43									c0.38	
v/s Ratio Perm												
v/c Ratio		0.90									0.87	
Uniform Delay, d1		31.7									33.2	
Progression Factor		0.69									1.00	
Incremental Delay, d2		3.5									4.8	
Delay (s)		25.4									38.0	
Level of Service		C									D	
Approach Delay (s)		25.4			0.0			0.0			38.0	
Approach LOS		C			A			A			D	

Intersection Summary			
HCM 2000 Control Delay	31.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	89.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
4: West Terminal/E-S

07-25-2022

Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Traffic Volume (veh/h)	0	0	475	1966	0	0
Future Volume (Veh/h)	0	0	475	1966	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	475	1966	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	67			77		
pX, platoon unblocked					0.65	
vC, conflicting volume			0		1605	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		50	0
tC, single (s)			4.2		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			70		100	100
cM capacity (veh/h)			1607		439	1091

Direction, Lane #	WB 1	WB 2	WB 3
Volume Total	868	786	786
Volume Left	475	0	0
Volume Right	0	0	0
cSH	1607	1700	1700
Volume to Capacity	0.30	0.46	0.46
Queue Length 95th (m)	9.5	0.0	0.0
Control Delay (s)	5.9	0.0	0.0
Lane LOS	A		
Approach Delay (s)	2.1		
Approach LOS			

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: W-S

07-25-2022

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	2180	189	0	0	0	0
Future Volume (Veh/h)	2180	189	0	0	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	2180	189	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				51		
pX, platoon unblocked						
vC, conflicting volume			2369		2180	727
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			2369		2180	727
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			209		40	371

Direction, Lane #	EB 1	EB 2	EB 3	EB 4
Volume Total	727	727	727	189
Volume Left	0	0	0	0
Volume Right	0	0	0	189
cSH	1700	1700	1700	1700
Volume to Capacity	0.43	0.43	0.43	0.11
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0			
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	88.4%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
7: N-W

07-25-2022

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	0	1966	0	0	278
Future Volume (vph)	0	0	1966	0	0	278
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)			6.0			6.0
Lane Util. Factor			0.91			0.88
Frt			1.00			0.85
Flt Protected			1.00			1.00
Satd. Flow (prot)			5193			2763
Flt Permitted			1.00			1.00
Satd. Flow (perm)			5193			2763
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	1966	0	0	278
RTOR Reduction (vph)	0	0	0	0	0	2
Lane Group Flow (vph)	0	0	1966	0	0	276
Heavy Vehicles (%)	0%	0%	1%	0%	0%	4%
Turn Type			NA			Prot
Protected Phases			2			8
Permitted Phases						
Actuated Green, G (s)			56.0			62.0
Effective Green, g (s)			56.0			62.0
Actuated g/C Ratio			0.43			0.48
Clearance Time (s)			6.0			6.0
Lane Grp Cap (vph)			2236			1317
v/s Ratio Prot			c0.38			c0.10
v/s Ratio Perm						
v/c Ratio			0.88			0.21
Uniform Delay, d1			33.9			19.8
Progression Factor			0.00			1.00
Incremental Delay, d2			2.5			0.4
Delay (s)			2.6			20.1
Level of Service			A			C
Approach Delay (s)		0.0	2.6		20.1	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	4.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	90.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
12: E-N

07-25-2022

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (veh/h)	0	0	1946	1079	0	0
Future Volume (Veh/h)	0	0	1946	1079	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	0	1946	1079	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		32				
pX, platoon unblocked						
vC, conflicting volume	3025				1946	649
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3025				1946	649
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	115				58	417

Direction, Lane #	WB 1	WB 2	WB 3	WB 4
Volume Total	649	649	649	1079
Volume Left	0	0	0	0
Volume Right	0	0	0	1079
cSH	1700	1700	1700	1700
Volume to Capacity	0.38	0.38	0.38	0.63
Queue Length 95th (m)	0.0	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0	0.0
Lane LOS				
Approach Delay (s)	0.0			
Approach LOS				

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	89.5%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
14: S-E

07-25-2022

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2169	0	0	0	0	602
Future Volume (vph)	2169	0	0	0	0	602
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0					6.0
Lane Util. Factor	0.91					0.88
Frt	1.00					0.85
Flt Protected	1.00					1.00
Satd. Flow (prot)	5092					2763
Flt Permitted	1.00					1.00
Satd. Flow (perm)	5092					2763
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	2169	0	0	0	0	602
RTOR Reduction (vph)	0	0	0	0	0	2
Lane Group Flow (vph)	2169	0	0	0	0	600
Heavy Vehicles (%)	3%	0%	0%	0%	0%	4%
Turn Type	NA					Perm
Protected Phases	4					
Permitted Phases						2
Actuated Green, G (s)	62.0					56.0
Effective Green, g (s)	62.0					56.0
Actuated g/C Ratio	0.48					0.43
Clearance Time (s)	6.0					6.0
Lane Grp Cap (vph)	2428					1190
v/s Ratio Prot	c0.43					
v/s Ratio Perm						c0.22
v/c Ratio	0.89					0.50
Uniform Delay, d1	31.0					26.9
Progression Factor	0.00					1.00
Incremental Delay, d2	2.5					1.5
Delay (s)	2.5					28.4
Level of Service	A					C
Approach Delay (s)	2.5			0.0	28.4	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	89.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
16: W-N/East Terminal

07-25-2022

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Traffic Volume (veh/h)	683	2169	0	0	0	0
Future Volume (Veh/h)	683	2169	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	683	2169	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)		75	74			
pX, platoon unblocked					0.62	
vC, conflicting volume	0				2089	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				586	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	58				100	100
cM capacity (veh/h)	1622				159	1091

Direction, Lane #	EB 1	EB 2	EB 3
Volume Total	1117	868	868
Volume Left	683	0	0
Volume Right	0	0	0
cSH	1622	1700	1700
Volume to Capacity	0.42	0.51	0.51
Queue Length 95th (m)	16.3	0.0	0.0
Control Delay (s)	7.3	0.0	0.0
Lane LOS	A		
Approach Delay (s)	2.9		
Approach LOS			

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	129.3%	ICU Level of Service	H
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
17: S-W & E-S

07-25-2022

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1946	495	0
Future Volume (vph)	0	0	0	1946	495	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)				6.0	6.0	
Lane Util. Factor				0.91	0.97	
Frt				1.00	1.00	
Flt Protected				1.00	0.95	
Satd. Flow (prot)				5142	3471	
Flt Permitted				1.00	0.95	
Satd. Flow (perm)				5142	3471	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	1946	495	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	1946	495	0
Heavy Vehicles (%)	0%	0%	0%	2%	2%	0%
Turn Type				NA	Prot	
Protected Phases				8	2	
Permitted Phases						
Actuated Green, G (s)				56.0	62.0	
Effective Green, g (s)				56.0	62.0	
Actuated g/C Ratio				0.43	0.48	
Clearance Time (s)				6.0	6.0	
Vehicle Extension (s)				3.0	3.0	
Lane Grp Cap (vph)				2215	1655	
v/s Ratio Prot				c0.38	c0.14	
v/s Ratio Perm						
v/c Ratio				0.88	0.30	
Uniform Delay, d1				33.9	20.7	
Progression Factor				0.02	1.00	
Incremental Delay, d2				2.6	0.5	
Delay (s)				3.2	21.2	
Level of Service				A	C	
Approach Delay (s)	0.0			3.2	21.2	
Approach LOS	A			A	C	

Intersection Summary			
HCM 2000 Control Delay	6.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	74.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 1: West Terminal

Movement	WB	WB	WB	NE	NE	NE
Directions Served	T	T	T	T	T	T
Maximum Queue (m)	47.5	53.0	49.2	30.9	42.7	41.5
Average Queue (m)	42.4	46.3	45.3	29.8	29.2	30.4
95th Queue (m)	50.7	49.6	47.3	31.2	37.6	37.0
Link Distance (m)	18.6	18.6	18.6	25.6	25.6	25.6
Upstream Blk Time (%)	46	58	59	56	38	49
Queuing Penalty (veh)	299	383	386	408	275	353
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: W-N & N-E

Movement	EB	EB	EB	SB	SB
Directions Served	T	T	T	L	L
Maximum Queue (m)	31.5	35.3	34.3	66.8	58.8
Average Queue (m)	22.0	11.5	13.8	55.3	40.1
95th Queue (m)	34.1	29.4	29.1	67.3	54.2
Link Distance (m)	22.8	22.8	22.8	37.0	37.0
Upstream Blk Time (%)	6	7	9	27	10
Queuing Penalty (veh)	42	54	63	90	34
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: East Terminal

Movement	EB	EB	EB	SW	SW	SW
Directions Served	T	T	T	T	T	T
Maximum Queue (m)	68.7	68.8	67.7	45.1	42.8	42.7
Average Queue (m)	59.1	57.9	55.6	36.7	36.8	37.1
95th Queue (m)	64.7	65.1	65.9	41.2	39.9	41.9
Link Distance (m)	27.3	27.3	27.3	19.8	19.8	19.8
Upstream Blk Time (%)	41	45	50	68	65	62
Queuing Penalty (veh)	298	327	362	440	423	404
Storage Bay Dist (m)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 4: West Terminal/E-S

Movement	WB	WB	WB
Directions Served	LT	T	T
Maximum Queue (m)	78.0	80.4	80.2
Average Queue (m)	62.9	62.8	59.8
95th Queue (m)	76.3	79.8	79.5
Link Distance (m)	59.5	59.5	59.5
Upstream Blk Time (%)	31	26	22
Queuing Penalty (veh)	253	213	182
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: W-S

Movement	EB	EB	EB	EB
Directions Served	T	T	T	R
Maximum Queue (m)	193.3	191.6	184.8	184.8
Average Queue (m)	182.9	182.2	168.5	96.4
95th Queue (m)	188.1	186.5	203.6	241.6
Link Distance (m)	176.8	176.8	176.8	176.8
Upstream Blk Time (%)	87	68	17	10
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: N-W

Movement	WB	WB	WB	SB	SB
Directions Served	T	T	T	R	R
Maximum Queue (m)	10.9	20.3	23.1	59.2	37.6
Average Queue (m)	1.7	12.3	14.5	30.4	15.2
95th Queue (m)	7.6	19.4	22.2	50.4	37.2
Link Distance (m)	7.7	7.7	7.7	37.4	37.4
Upstream Blk Time (%)	7	50	54	3	0
Queuing Penalty (veh)	43	330	352	5	0
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 12: E-N

Movement	WB	WB	WB	WB
Directions Served	T	T	T	R
Maximum Queue (m)	201.2	198.4	200.7	199.2
Average Queue (m)	190.6	185.9	167.8	124.3
95th Queue (m)	207.7	213.1	231.5	274.5
Link Distance (m)	187.5	187.5	187.5	187.5
Upstream Blk Time (%)	50	30	19	17
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (m)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 14: S-E

Movement	EB	EB	EB	NB	NB
Directions Served	T	T	T	R	R
Maximum Queue (m)	1.6	17.1	19.5	72.2	54.0
Average Queue (m)	0.2	2.7	10.2	55.9	40.4
95th Queue (m)	1.9	10.3	19.7	76.0	57.6
Link Distance (m)	20.9	20.9	20.9	48.7	48.7
Upstream Blk Time (%)		1	1	13	2
Queuing Penalty (veh)		5	9	39	5
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 16: W-N/East Terminal

Movement	EB	EB	EB
Directions Served	LT	T	T
Maximum Queue (m)	70.2	76.5	74.7
Average Queue (m)	49.3	39.4	31.8
95th Queue (m)	74.5	72.8	70.6
Link Distance (m)	54.6	54.6	54.6
Upstream Blk Time (%)	5	2	2
Queuing Penalty (veh)	51	23	20
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 17: S-W & E-S

Movement	WB	WB	WB	NB	NB
Directions Served	T	T	T	L	L
Maximum Queue (m)	41.0	39.6	39.8	68.4	65.5
Average Queue (m)	26.4	28.1	27.3	58.0	45.3
95th Queue (m)	40.8	41.6	42.7	69.6	64.4
Link Distance (m)	31.8	31.8	31.8	39.6	39.6
Upstream Blk Time (%)	2	3	4	59	25
Queuing Penalty (veh)	16	17	23	146	62
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 6436