Park Place
North Lands
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.

The lands situated north of the Open Space lands, herein referred to as the 'North Lands' are subject to a holding provision. The lands subject to the (H) symbols shall not be used for any purpose permitted by the provisions of the governing By-law until such time as the (H) symbols are removed.

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.

If was further noted that a TIS submission would be required prior to the removal of the Holding Provision to allow for the development of the North Lands.

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 along with the proposed development of the Park Place North Lands, 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;

- The proposed development of the North Lands consists mainly of industrial land uses consistent with the as of right zoning. The proposed development of the North Lands is anticipated to generate approximately 179 and 181 vehicular trips under the AM and PM peak hours, respectively.

  The proposed industrial development site will connect to the adjacent transportation network via two full movement connections with Bayview Drive. These two unsignalized site intersections are found to operate well and will not require any additional improvements to accommodate the anticipated traffic demands as it is currently served by a continuous centre two-way left turn lane.

  It is acknowledged intersection pedestrian signals (IPS) are currently provided at the Bayview Drive and North Access-Existing Medical Office South Driveway to facilitate pedestrian crossings of Bayview Drive. It is our understanding traffic signals are contemplated by the applicant to better serve the proposed development with the applicant potentially pursuing the installation of traffic signal control at this site access location as development proceeds.

  The overall impact of the proposed North Lands development on the adjacent transportation network is minor. The additional 179 and 181 vehicular trips 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 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 development of the North 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 with the development of the North Lands.

  It is noted the proposed North Lands development would contribute less than 20 vehicular trips to the ramp terminal intersections under both the AM and PM peak hours; 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 development of the Park Place North 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 significant traffic operations and safety benefits 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 include more retail-commercial to complete and complement the existing development.

In the longer term, it is anticipated the vacant land just north of the current concentration of retail-commercial uses could be developed for various employment uses (e.g. office park, light industrial, warehousing, etc.), herein referred to as the North Lands.

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.

1.2 Purpose

Following the acceptance of the Park Place Stage 2 TIS, it was noted an additional TIS submission would be required to facilitate the removal of the Holding Provision to allow development of the North Lands in accordance with the as of right zoning.

The intent of this TIS is to account and assess traffic conditions with the development of the North Lands.

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

- Facilitate the removal of the Holding Provision for the Park Place North Lands;
- 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)
  - Total traffic comprising:
    - 2026 background traffic
    - 2026 Park Place North Lands trip generation (proposed development)
- <u>2031 Horizon Year (Five Years following Build-Out of North Lands):</u>

- Background traffic comprising:
  - Non-Park Place traffic growth
  - 2031 Park Place trip generation (incremental site traffic for additional development post-2021)
- Total traffic comprising:
  - 2031 background traffic
  - 2026 Park Place North lands trip generation (proposed development)

- <u>2036 Horizon Year (10 Years following Build-Out of North Lands):</u>
  - Background traffic comprising:
    - Non-Park Place traffic growth
    - 2031 Park Place trip generation (incremental site traffic for additional development post-2021)
  - Total traffic comprising:
    - 2036 background traffic
    - 2026 Park Place North Lands 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;
- Development of the Park Place North 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). It is noted that within the North Lands (Area 4, 5, and 6) an 83,400 SF medical-office development is already built and occupied. The traffic contributions from this development have been accounted for already.

In summary, the additional proposed development within the North Lands consists primarily of 513,460 SF (47,699 SM) of industrial development anticipated to be build-out in Horizon Year 2026.

Within the North Lands there is a small land parcel situated in the south-west quadrant of the Bayview Drive/Big Bay Point Road intersection anticipated for service centre use; however, this portion of development has not been included within this assessment due the small size of development and on the basis that this land use is not anticipated to generate any significant vehicle trips, rather it would mainly attract pass-by trips.

Detailed development statistics are noted as follows:

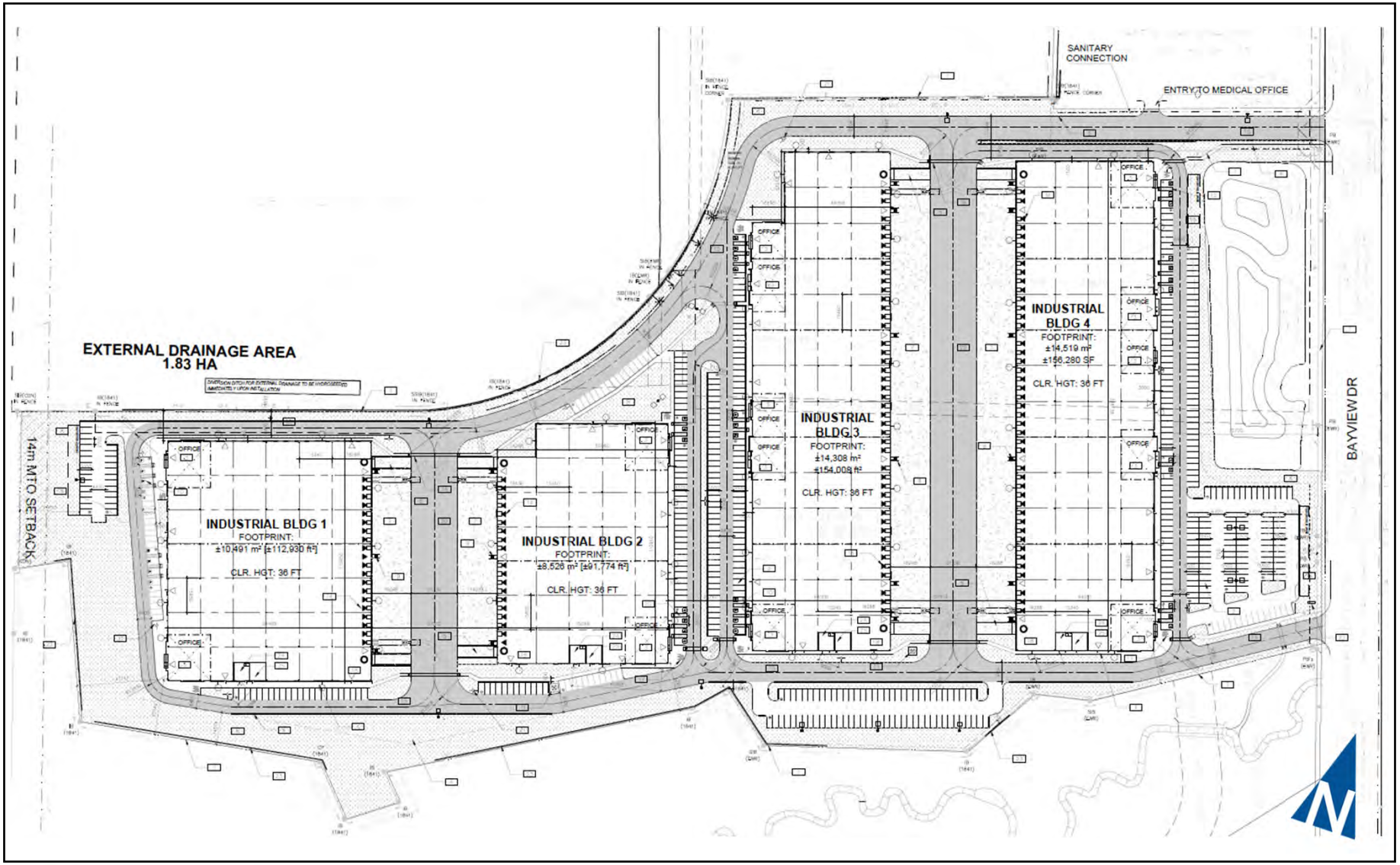
- Industrial Building 1: 112,840 SF (10,480 SM);
- Industrial Building 2: 91,493 SF (8,500 SM);
- Industrial Building 3: 153,331 SF (14,245 SM); and
- Industrial Building 4: 155,796 SF (14,474 SM).

The overall site would be served by a total of 557 parking spaces.

Vehicular access to the North Lands situated on the west side of Bayview Drive and north of the existing concentration of retail-commercial uses would be provided via two full-movement connections with Bayview Drive. The proposed northerly access driveway is the existing south driveway serving the medical-office development, and the proposed southerly access driveway would be located approximately across from the south driveway serving the Coca-Cola development on the east side of Bayview Drive.

It is our understanding that Industrial Building 1 is anticipated as a warehousing operation. Whereas, Industrial Buildings 2, 3, and 4, are anticipated to be characterized by a mix of manufacturing, service, and general industrial uses. At this point in time the variation and the proportion of each type of use is unknown.

Figure 2.1 illustrates the proposed industrial development site plan within the Park Place North Lands.



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Site Plan

Park Place North Lands Traffic Impact Study
210434

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.

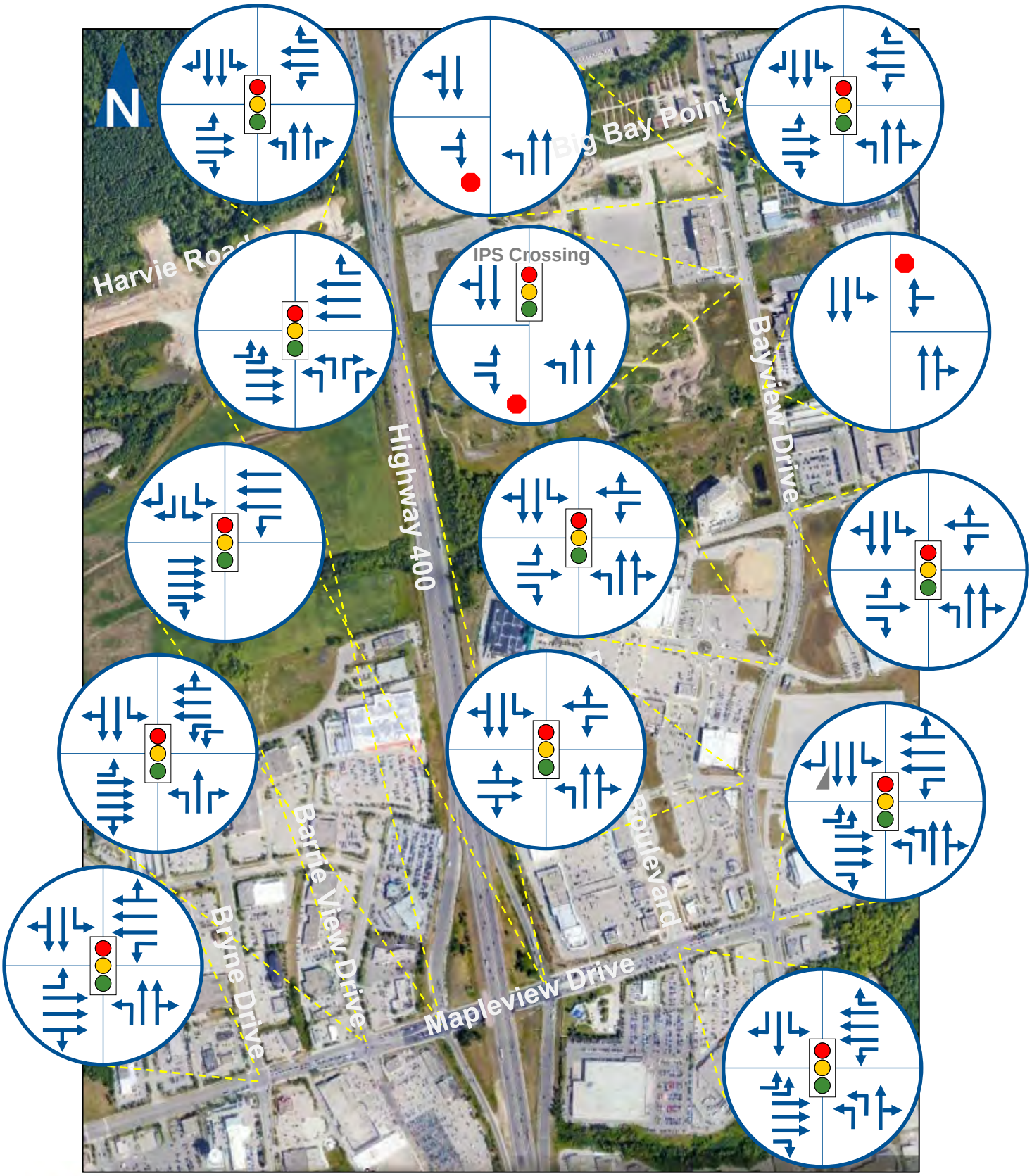
TABLE 3.1: EXISTING ROAD NETWORK CHARACTERISTICS

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



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.

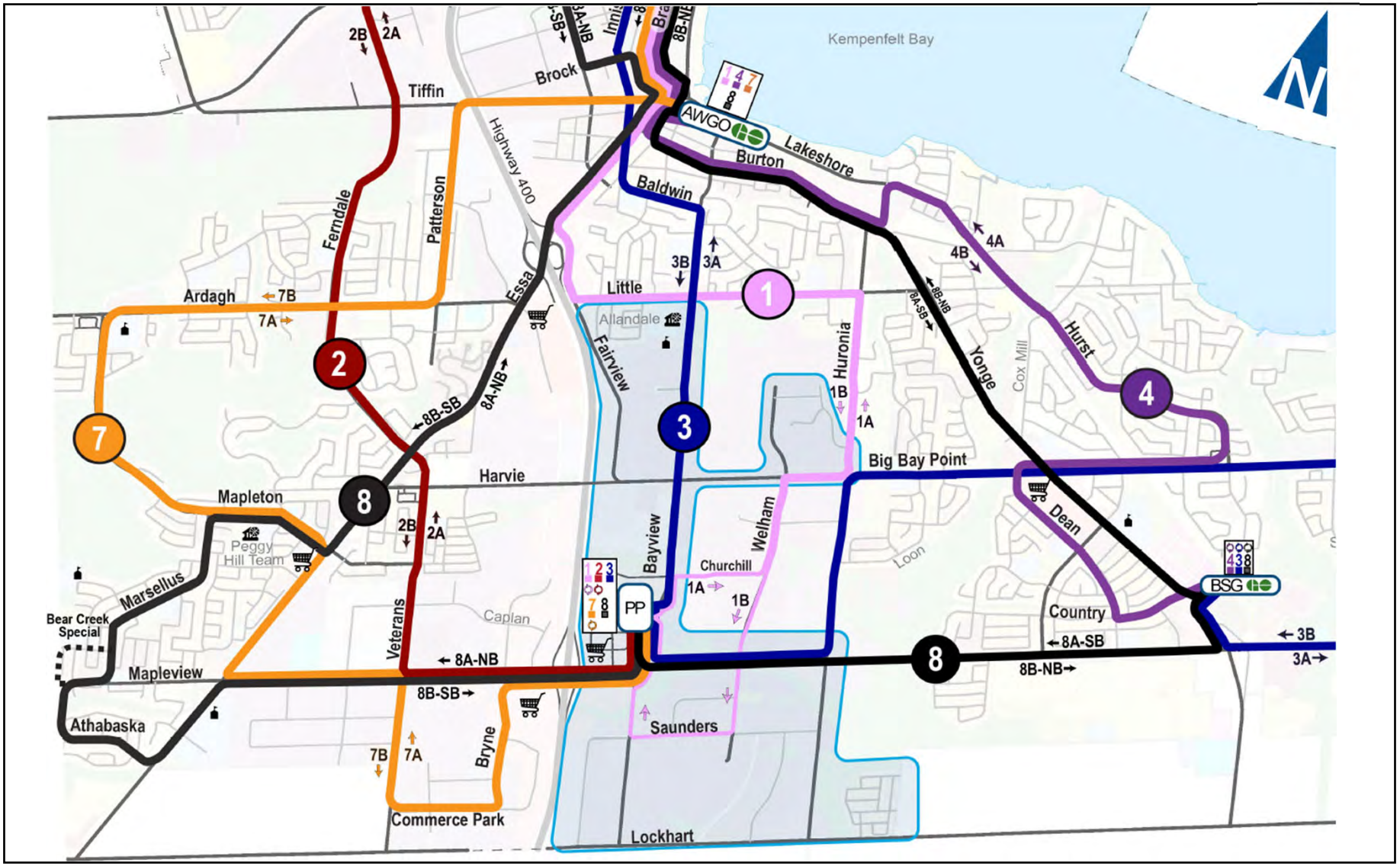
Inter-regional travel is provided by GO Transit services. Two GO Stations currently serve the residents of Barrie – the Allandale Waterfront GO Station and the Barrie South GO Station provide rail service as well as connections to various Barrie Transit routes. When connecting to or from the GO Train, 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.



Transit Routes

Figure 3.2

4 Forecasts

4.1 Background Traffic

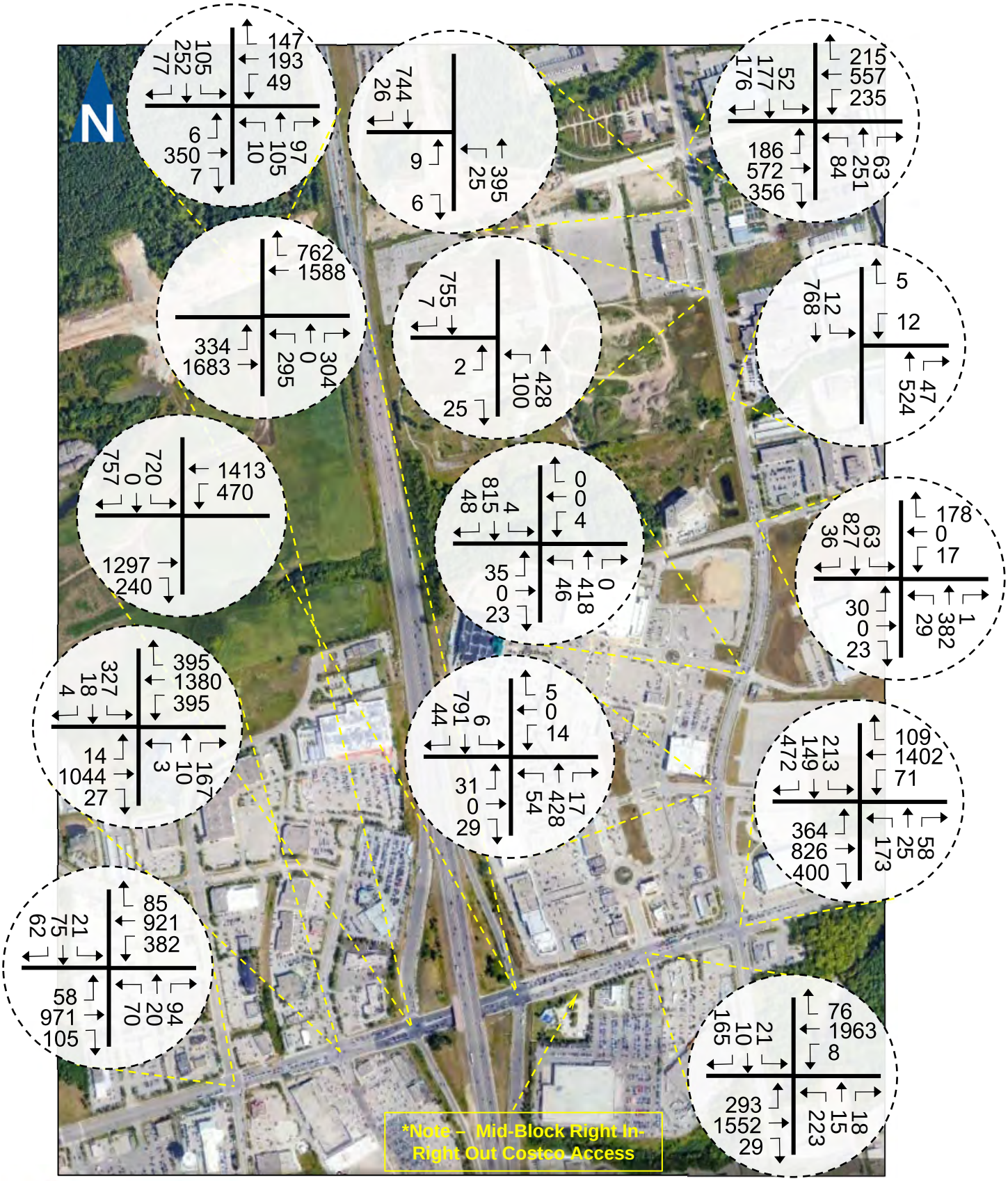
Through the agreed upon Terms of Reference developed for this TIS, both City and MTO staff confirmed the use of previous traffic modeling forecasts for use. These forecasts properly account for the redistribution of trips in the road network, resulting from the recently completed Harvie Road-Big Bay 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.

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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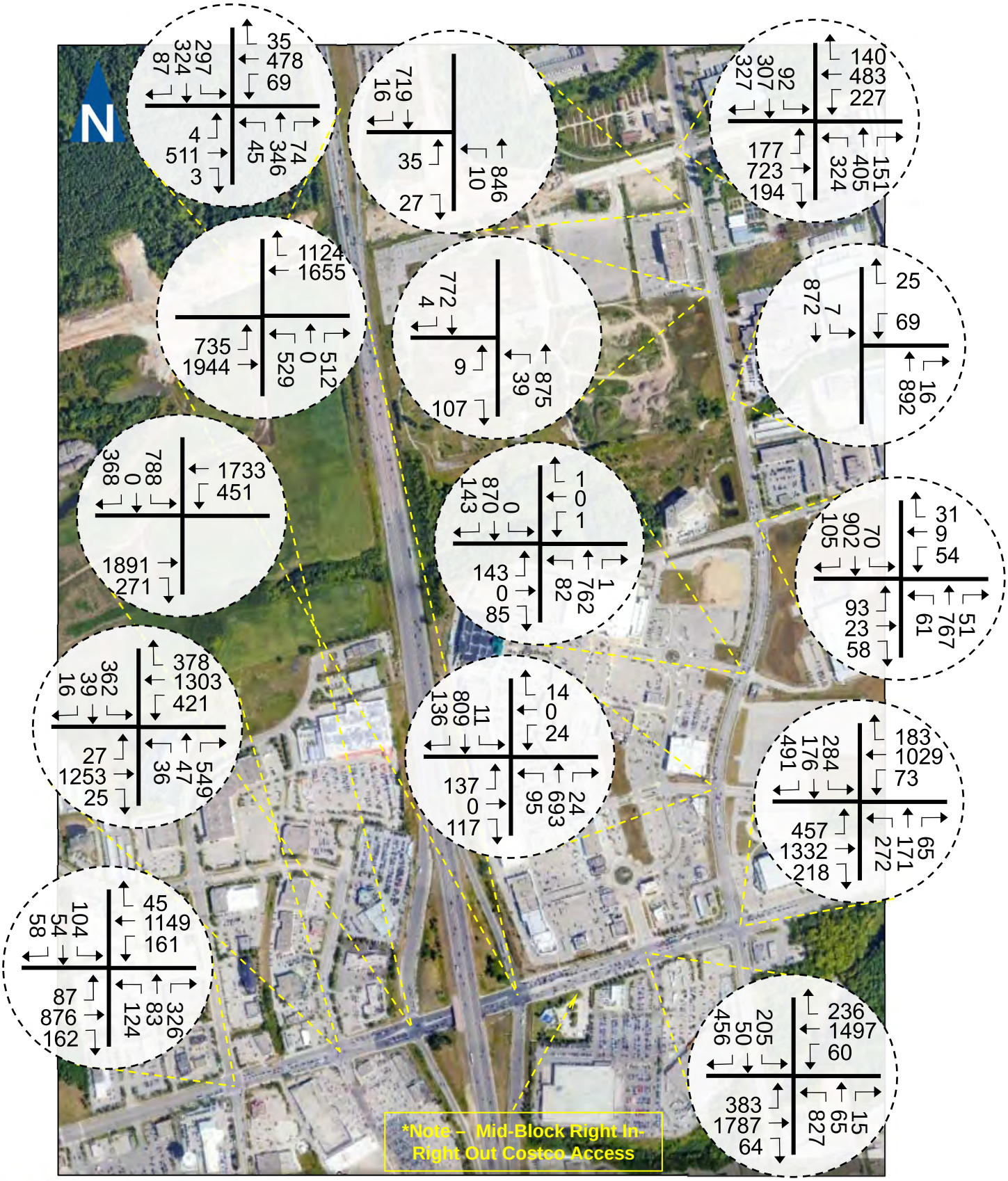
2026 Background Traffic AM Peak Hour

Figure 4.1



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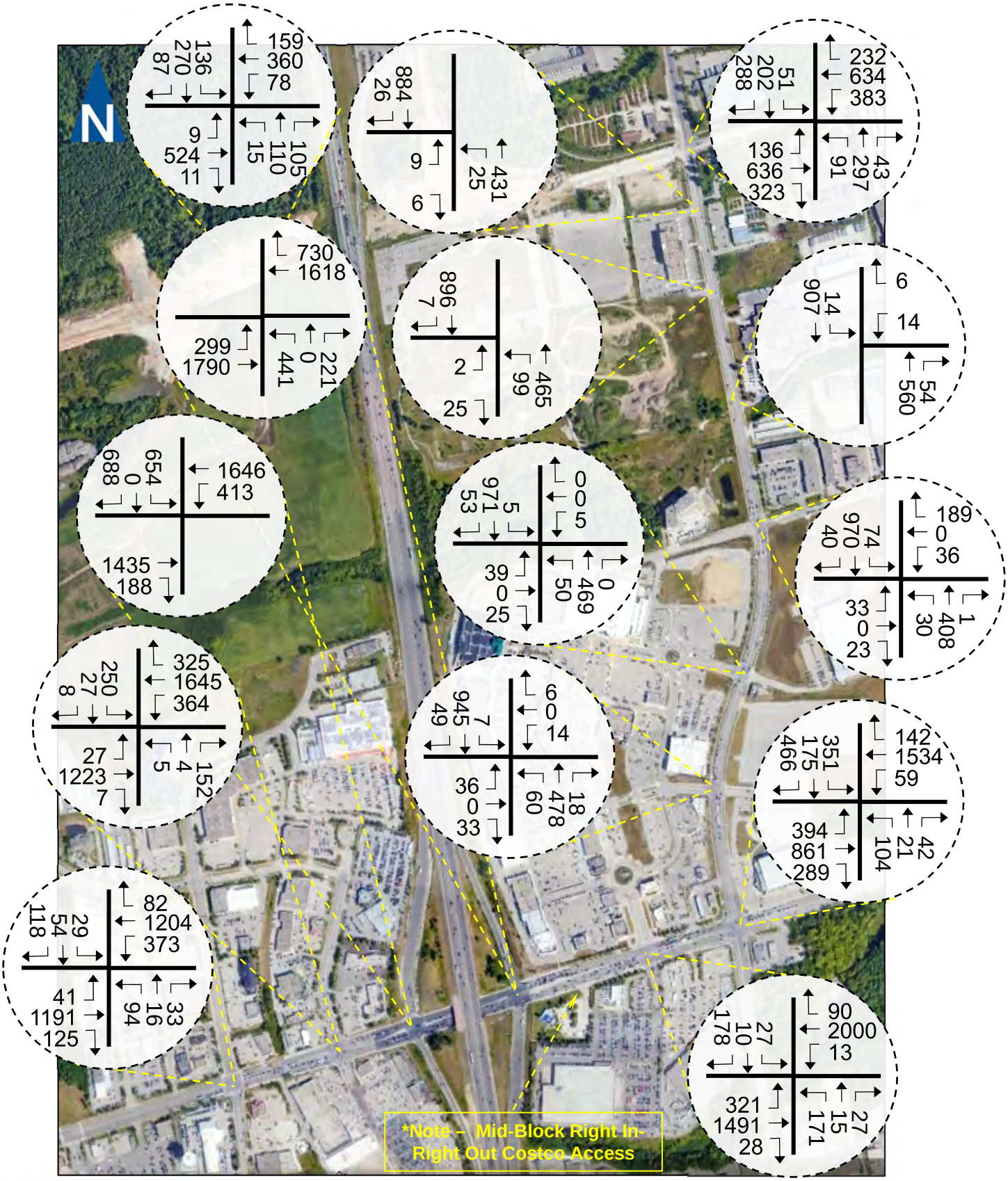
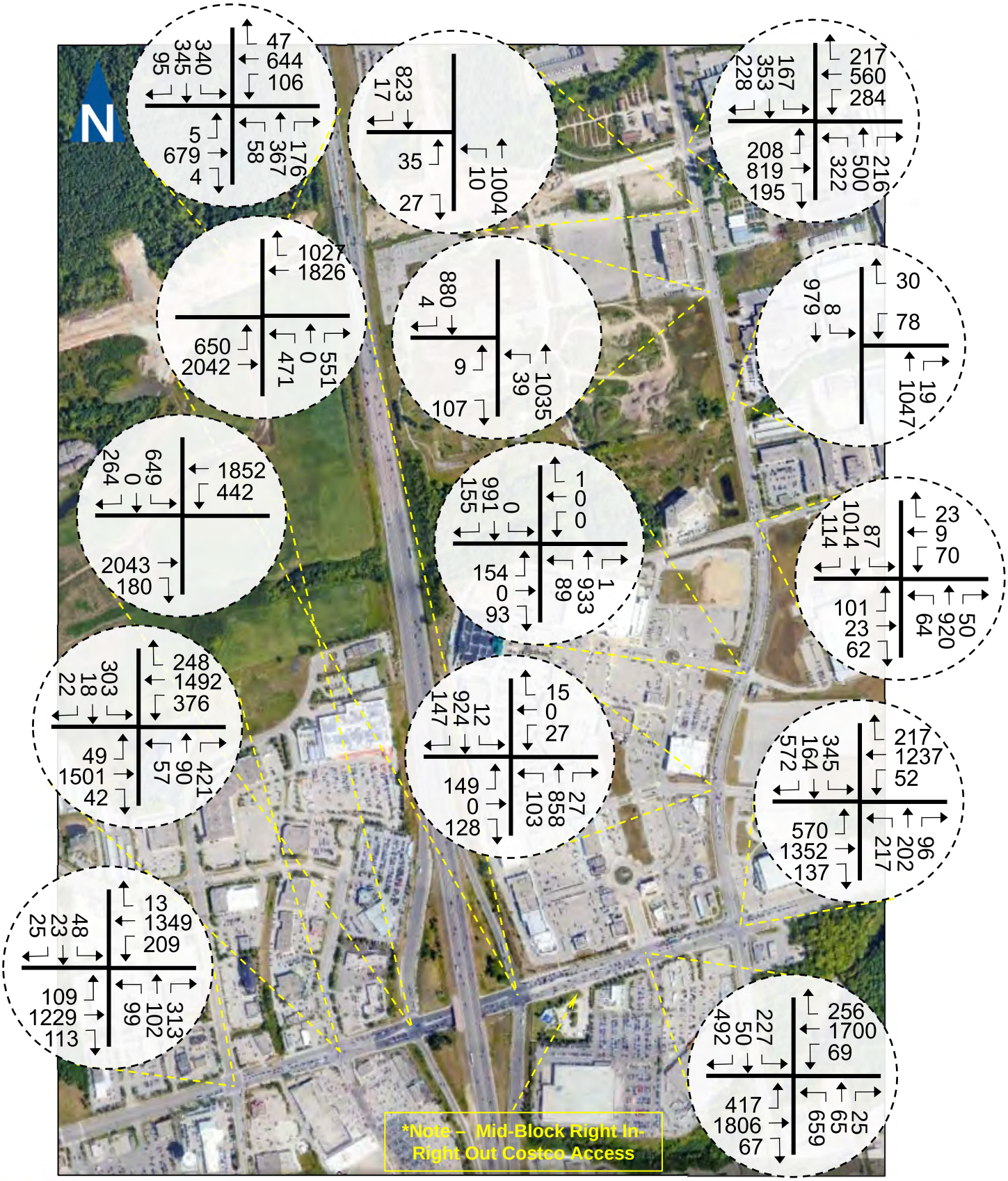
2026 Background Traffic PM Peak Hour

Figure 4.2



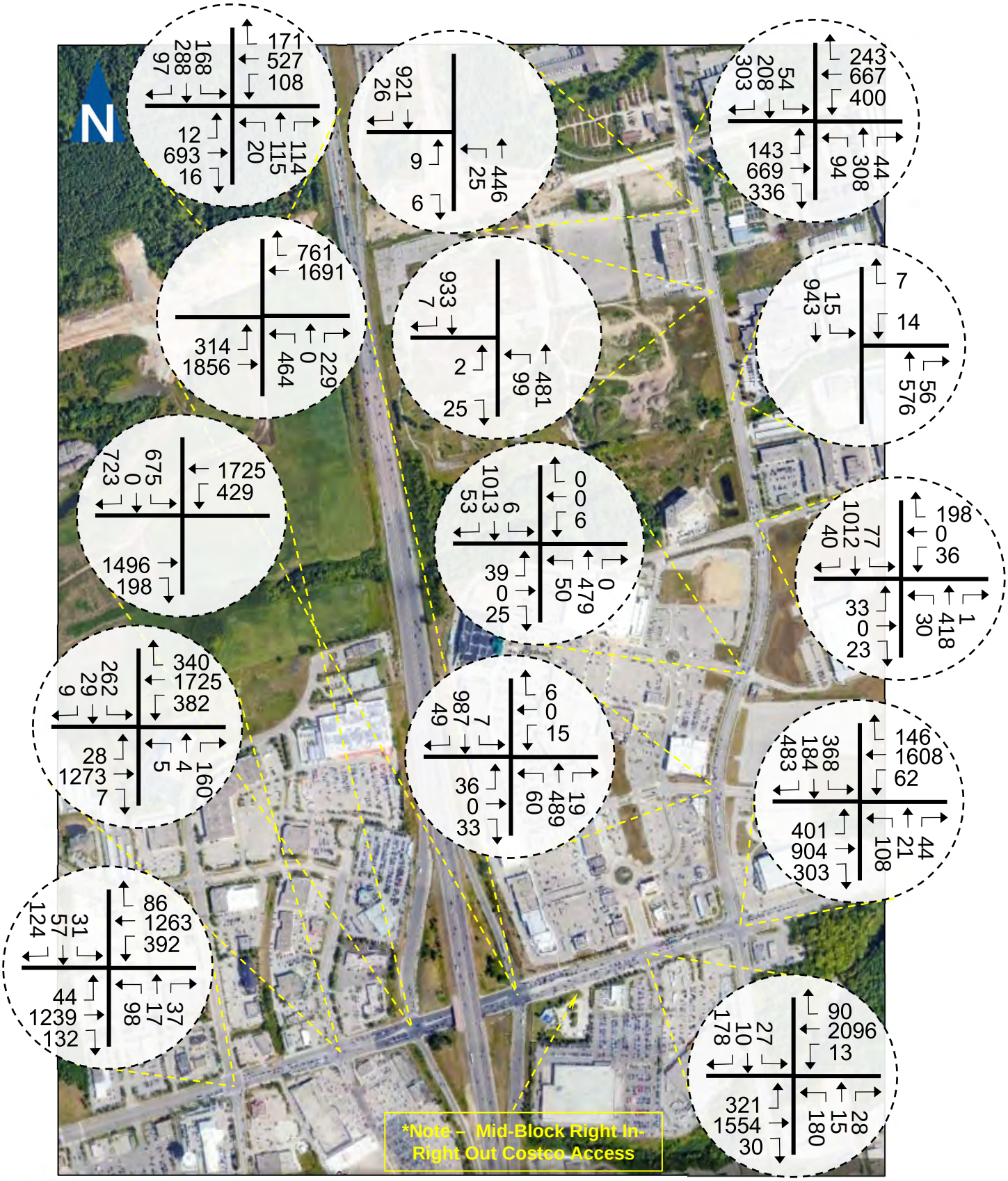
2031 Background Traffic AM Peak Hour

Figure 4.3



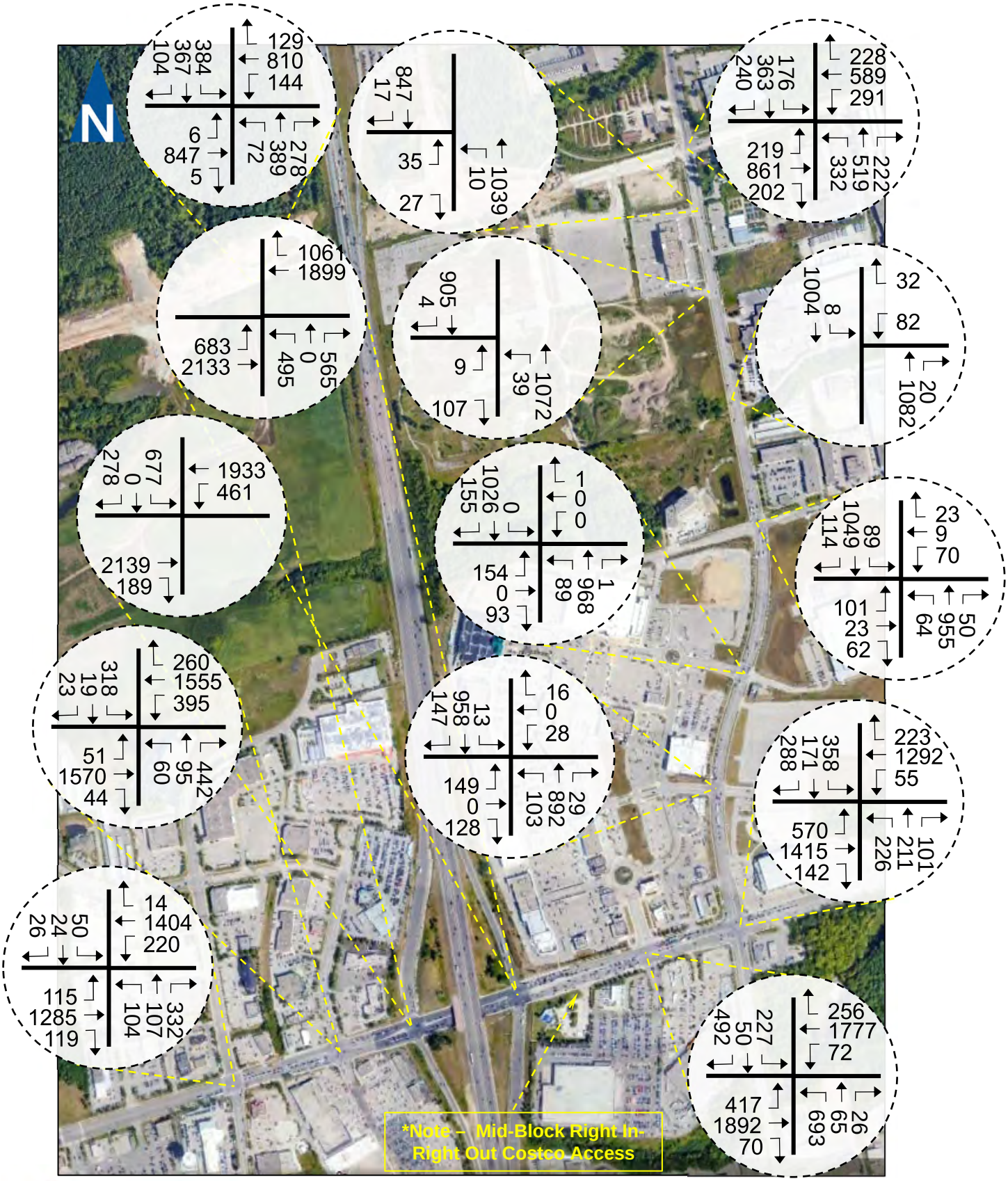
2031 Background Traffic PM Peak Hour

Figure 4.4



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 industrial development on the Park Place North Lands.

As we understand since there are no confirmed tenants for the proposed industrial buildings we have investigated peak trip generation demands for several land use codes. The land use codes investigated included:

- Land Use Code 110 (General Light Industrial) – A free-standing facility devoted to a single use. The facility has an emphasis on activities other than manufacturing and typically has minimal office space. Typical light industrial activities include printing, material testing, and assembly of data processing equipment.
- Land Use Code 130 (Industrial Park) – An industrial park contains several individual or related facilities. It is characterized by a mix of manufacturing, service, and warehouse facilities with a wide variation in the proportion of each type of use.
- Land Use Code 150 (Warehousing) – A warehouse is primarily devoted to the storage of material, but it may also include office and maintenance areas.

It is our understanding that Industrial Building 1 is anticipated as a warehousing operation. Whereas, Industrial Buildings 2, 3, and 4, are anticipated to be characterized by a mix of manufacturing, service, and general industrial uses. At this point in time the variation and the proportion of each type of use is unknown.

Based upon our assessment, Land Use Code 130 best represents the anticipated occupancy of Industrial Buildings 2, 3, and 4. Whereas, Land Use Code 150 is utilized to estimate site trips generated by Industrial Building 1.

Table 4.1 summarizes the resultant weekday AM and PM peak hour site trip generation. Average trips rates were utilized as no fitted curve equations are provided.

A total of 179 and 181 vehicular trips are forecast to be generated and added onto the adjacent transportation network under the AM and PM peak hours, respectively.

TABLE 4.1: NORTH LANDS SITE TRIP GENERATION

Building	Land Use	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Building 1 10,480 SM (112,840 SF)	LUC 150 Warehousing	15	4	19	6	15	21
Building 2 8,500 SM (91,493 SF)	LUC 130 Industrial Park	30	7	37	8	29	37
Building 3 14,245 SM (153,331 SF)		49	12	61	13	48	61
Building 4 14,474 SM (155,796 SF)		50	12	62	13	49	62
TOTAL: ***47,699 SM*** ***(513,460 SF)***	-	***144***	***35***	***179***	***40***	***141***	***181***

4.2.2 Trip Distribution and Assignment

The trip distribution utilized is specific for the proposed industrial product. Based upon direction provided by the applicant the vehicular distribution for a warehousing land use, and for an industrial park/logistics park will result in a distribution between smaller communities. That is, the adjacent use of Fairview Road and Essa Road would have a more significant allocation.

In summary, the trip distribution was based on the distribution patterns employed in the Park Place Stage 2 TIS (March 2020) as a starting point; however, has been adjusted accordingly accounting for the proposed industrial product.

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

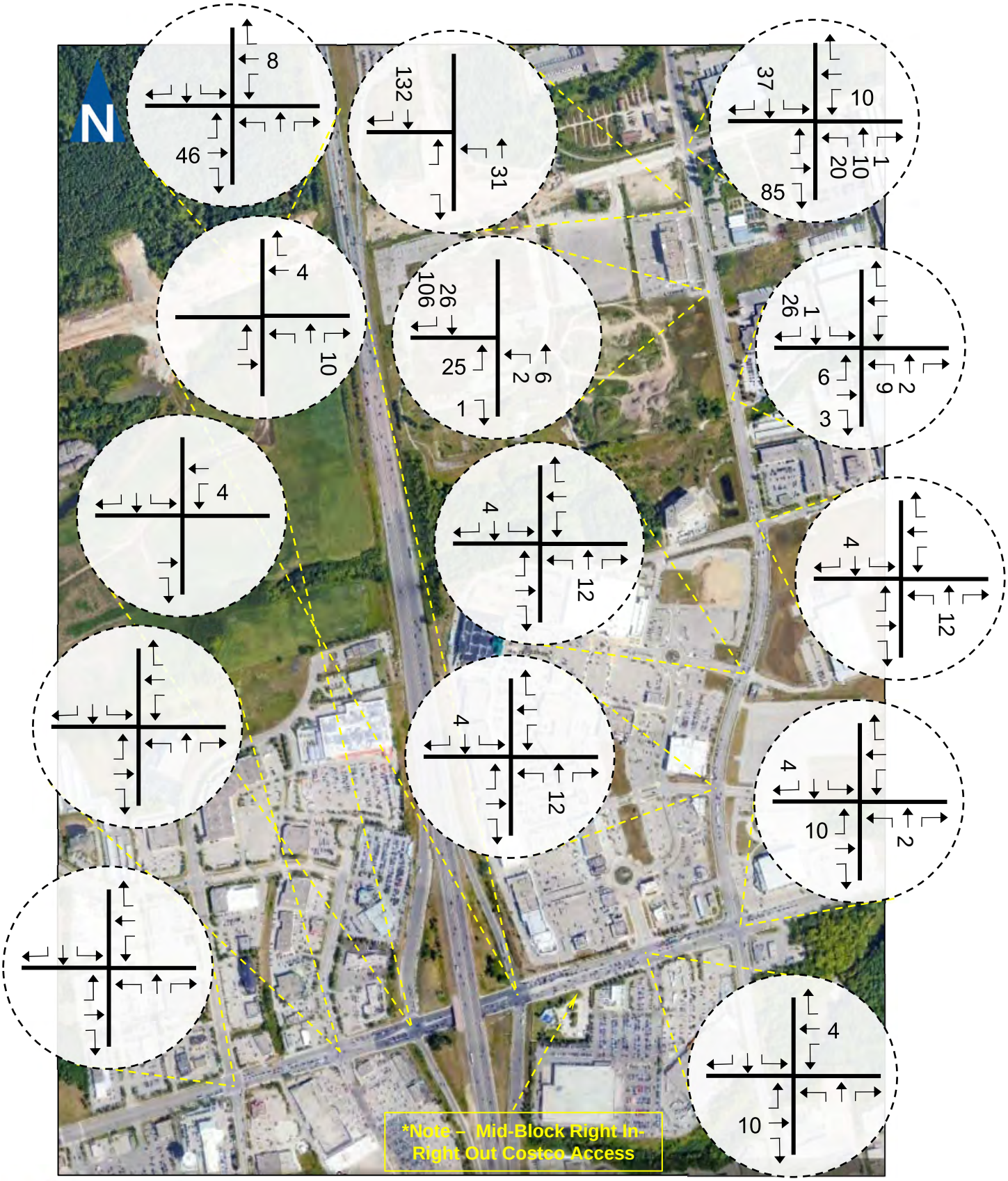
TABLE 4.2: TRIP DISTRIBUTION

To/From	Via	AM		PM	
		In	Out	In	Out
North	Bayview Drive	10%	28%	16%	11%
	Highway 400 (Essa Road)	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%
	Highway 11 via Highway 400	27%	20%	21%	24%
West	Harvie Road	3%	1%	5%	8%
	Highway 90 via Harvie Road	29%	23%	20%	25%
TOTAL[1]		***100%***	***100%***	***100%***	***100%***

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

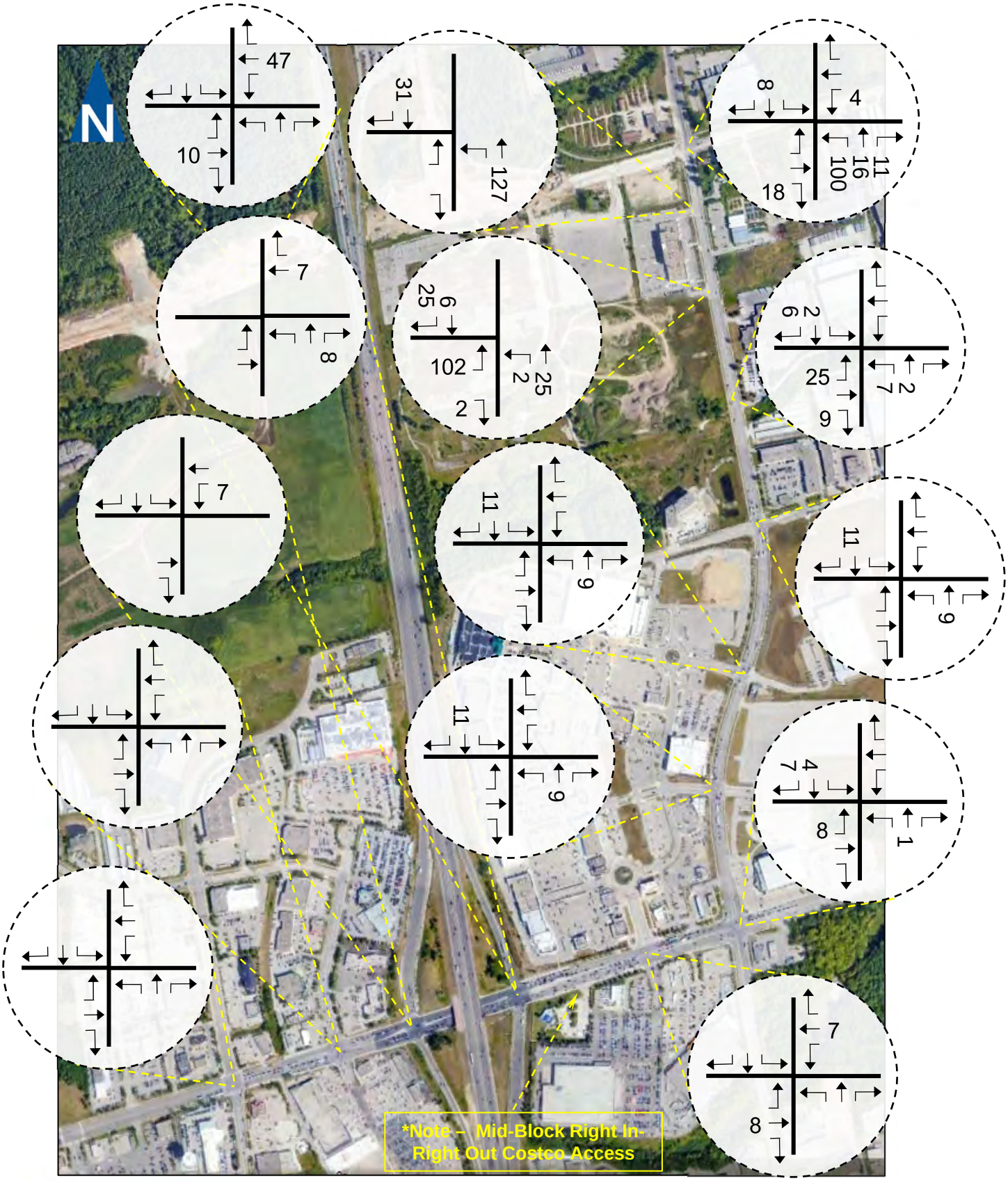
The Park Place North Lands trips have been assigned to the study area road network and logically routed to/from the site accesses based on the origin or destination.

Figure 4.7 and **Figure 4.8** illustrate the respective AM and PM peak hour site traffic for the Park Place North Lands industrial development.



Park Place North Lands Site Traffic AM Peak Hour

Figure 4.7



Park Place North Lands Site Traffic PM Peak Hour

Figure 4.8

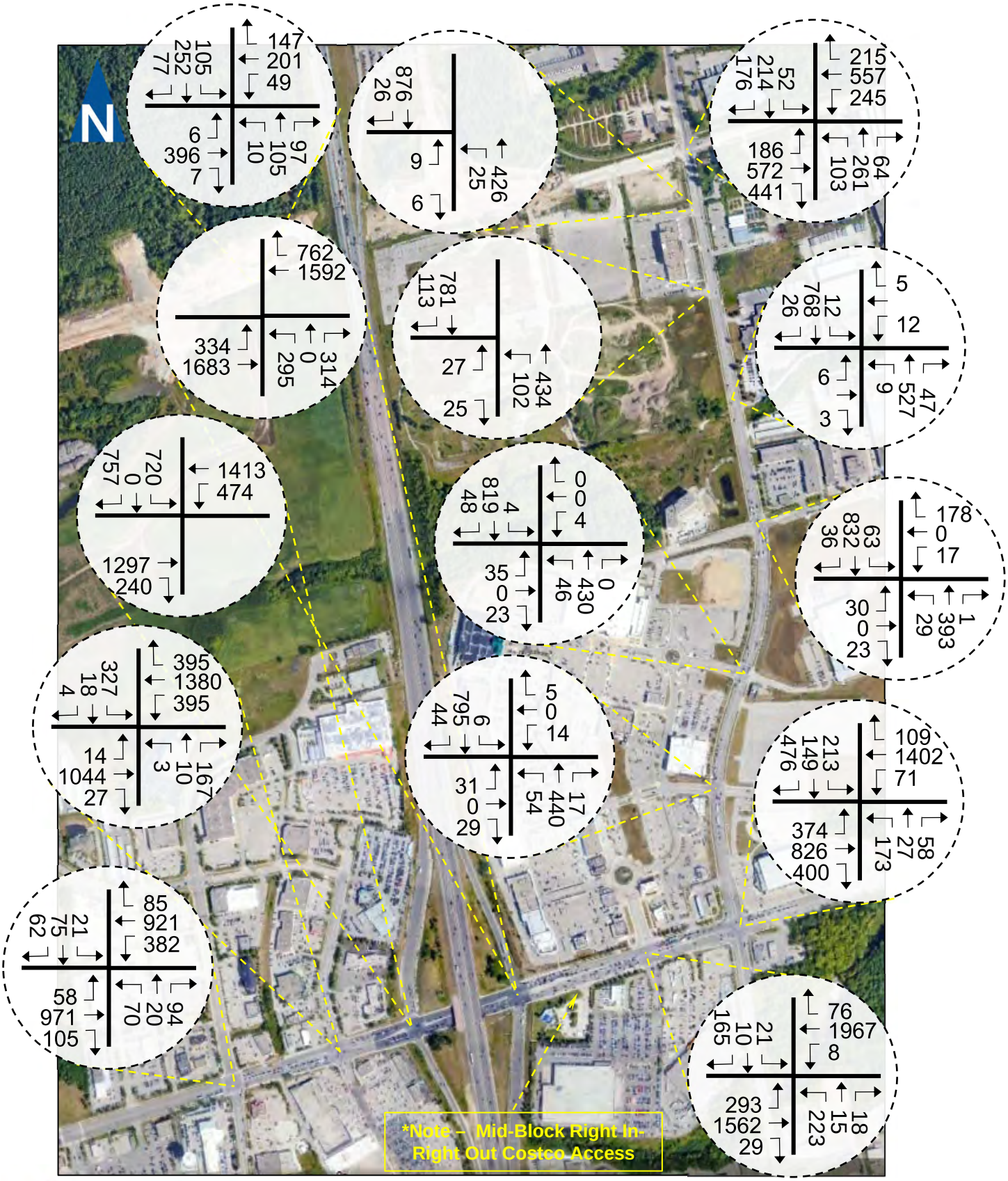
4.3 Total Traffic

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.

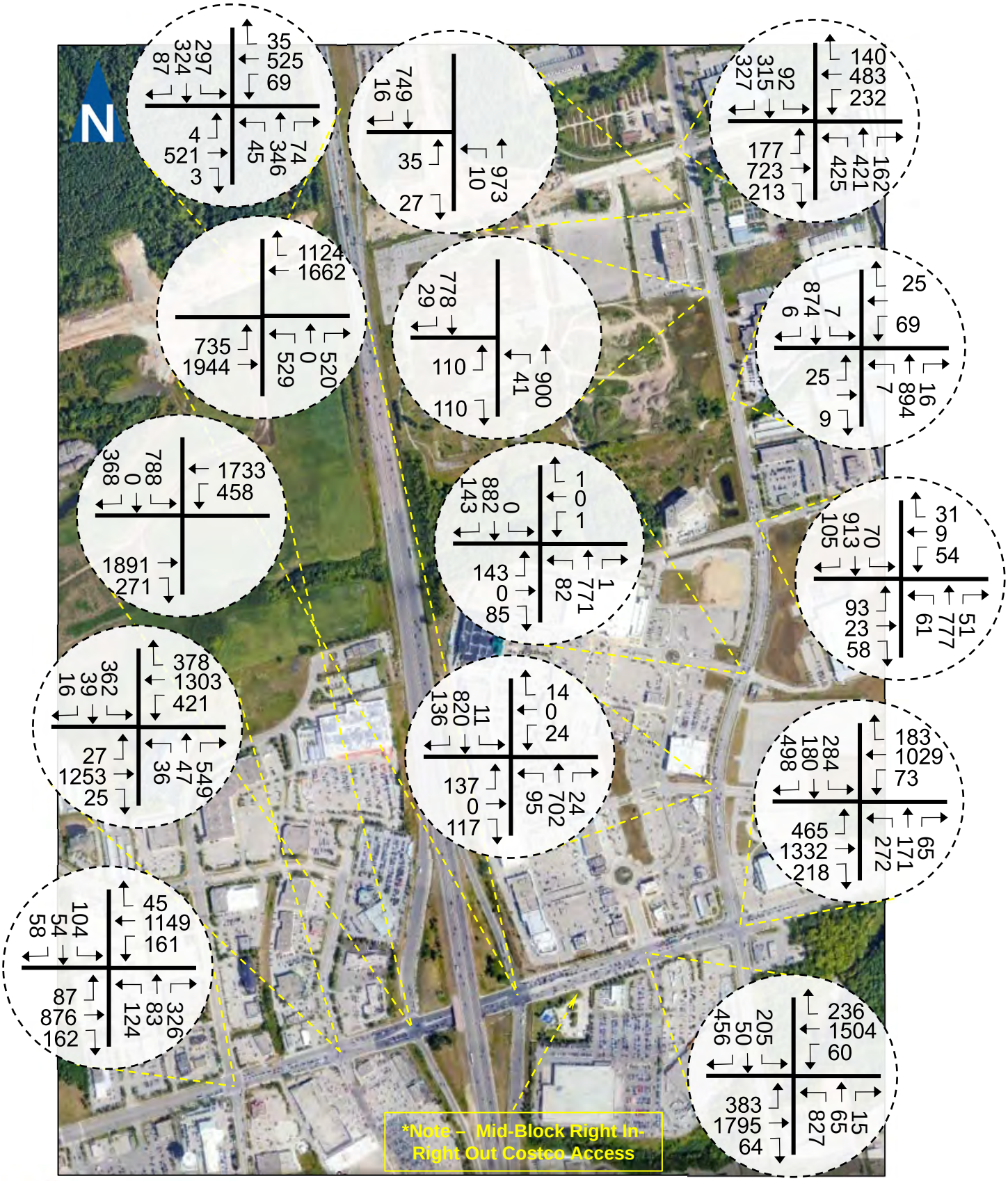
Figure 4.13 and **Figure 4.14** show the resultant traffic volumes representing total traffic for the 2036 AM and PM peak hours, respectively.



paradigm TRANSPORTATION SOLUTIONS LIMITED

2026 Total Traffic AM Peak Hour

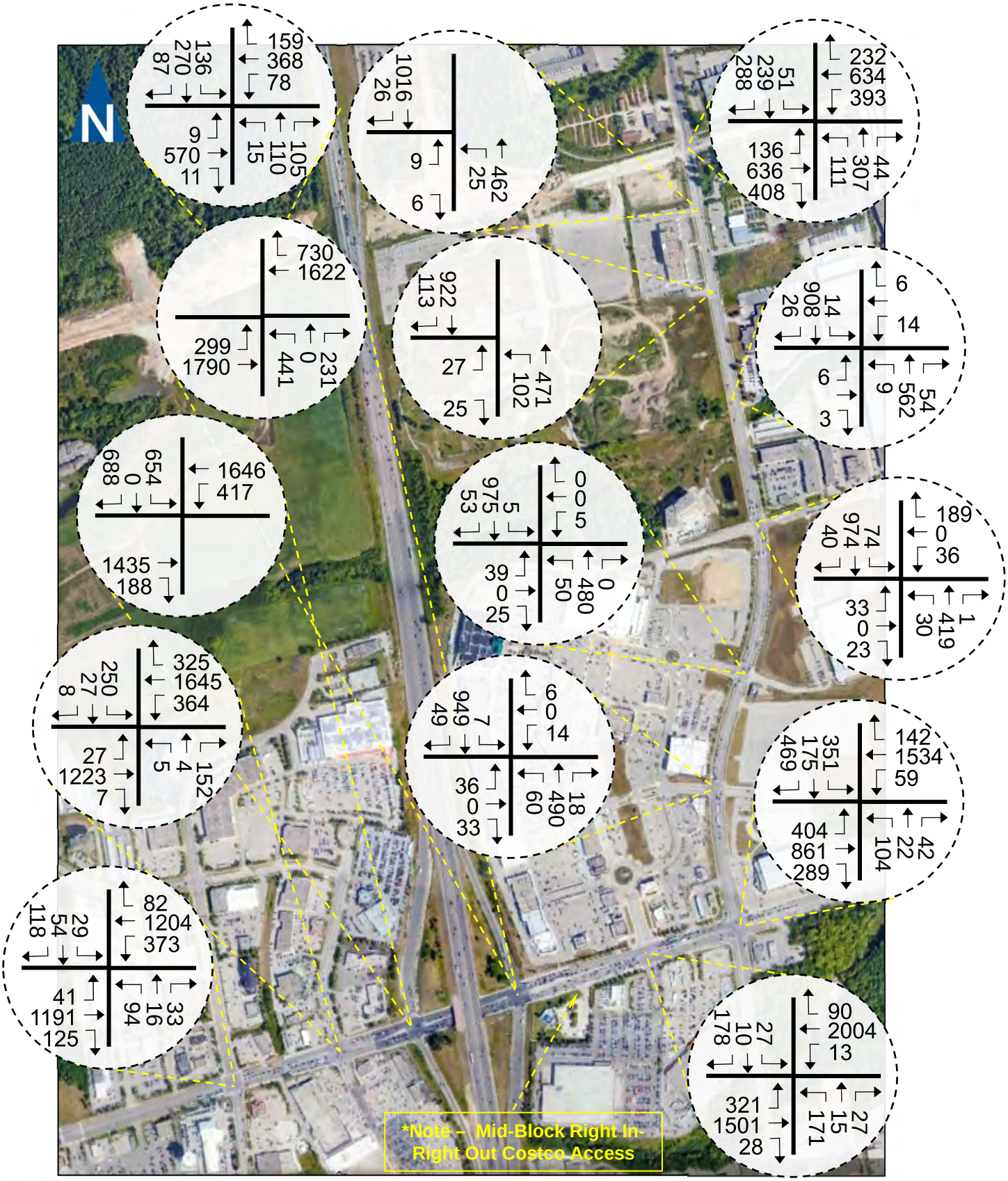
Figure 4.9



paradigm TRANSPORTATION SOLUTIONS LIMITED

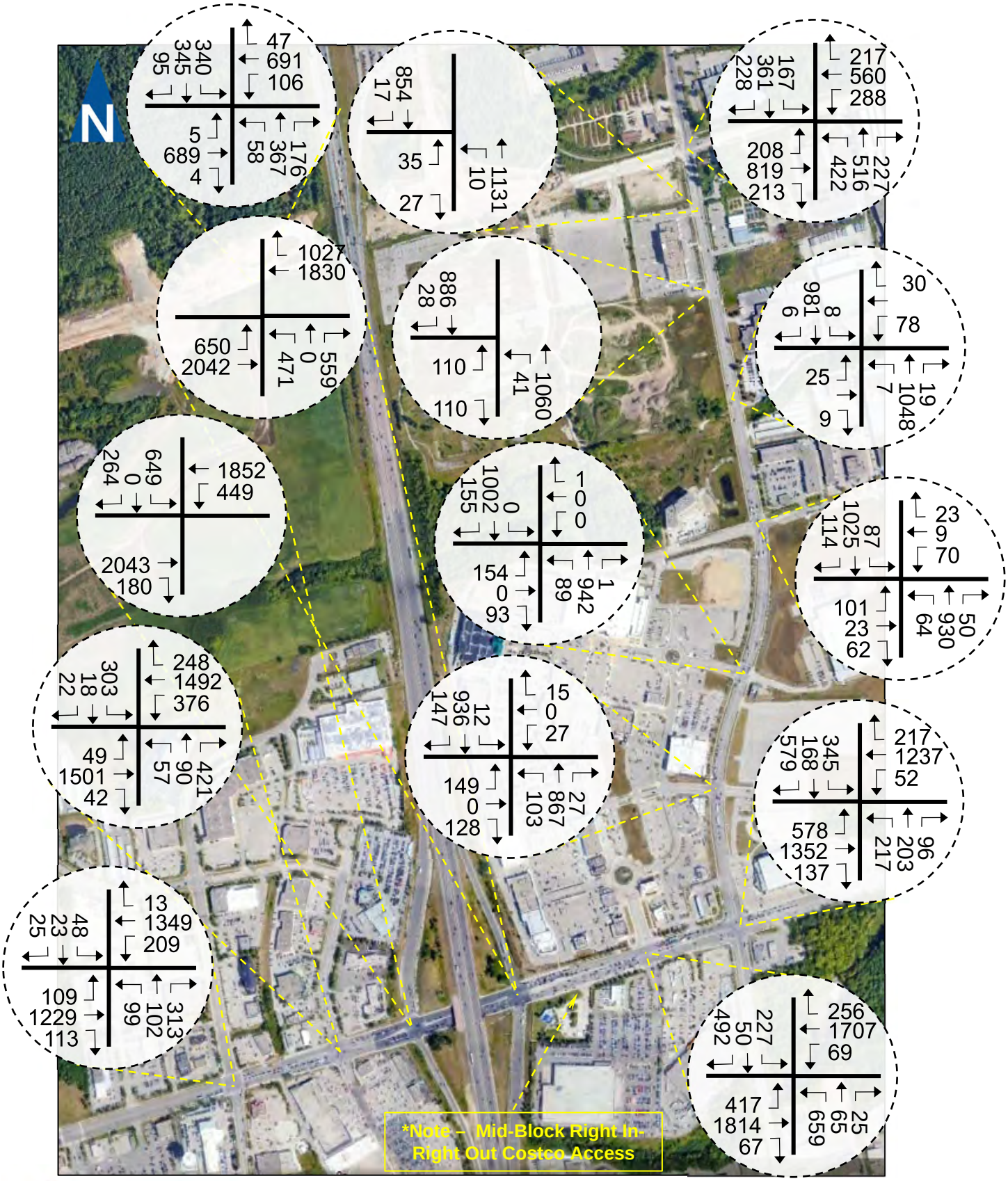
2026 Total Traffic PM Peak Hour

Figure 4.10



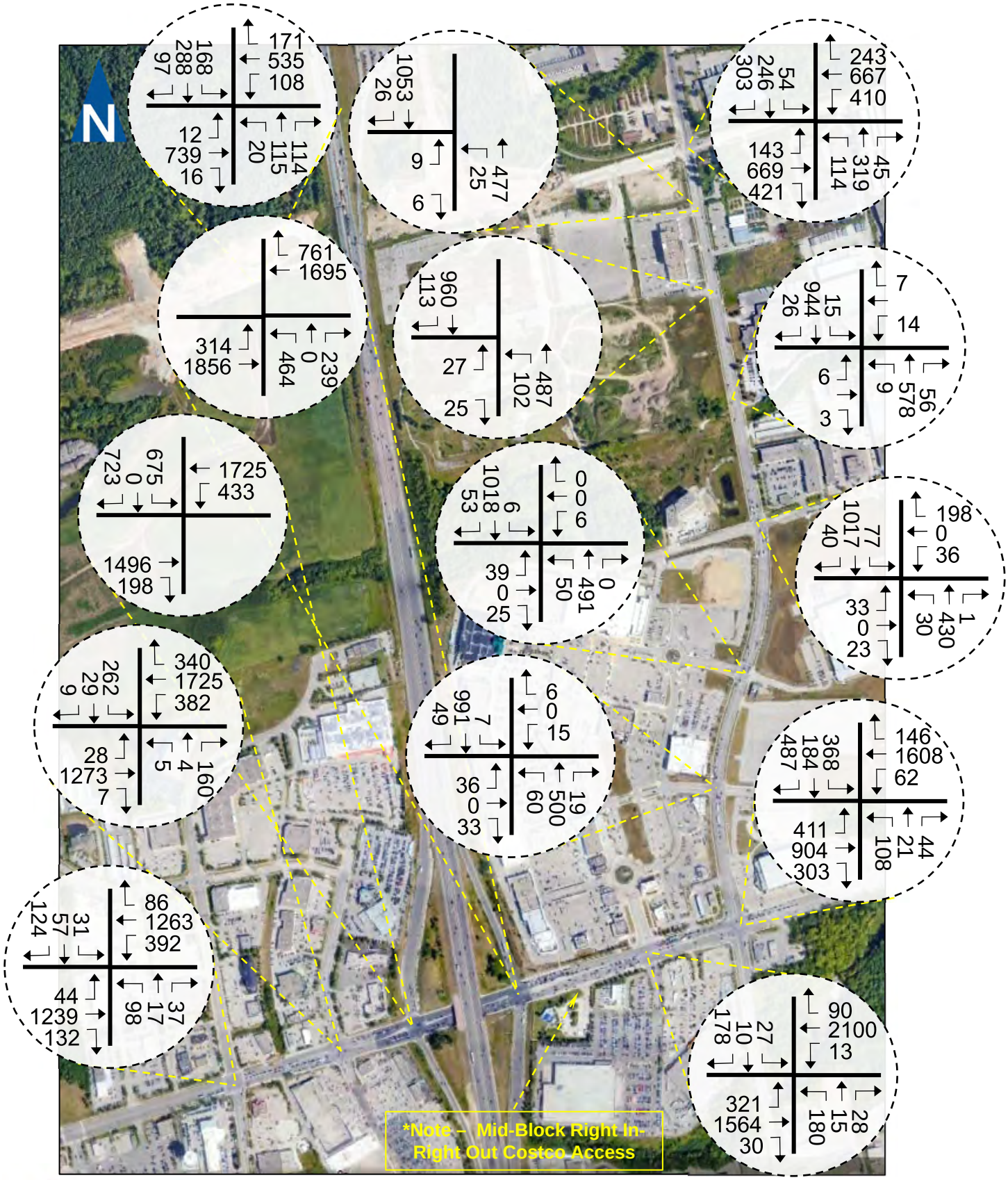
2031 Total Traffic AM Peak Hour

Figure 4.11



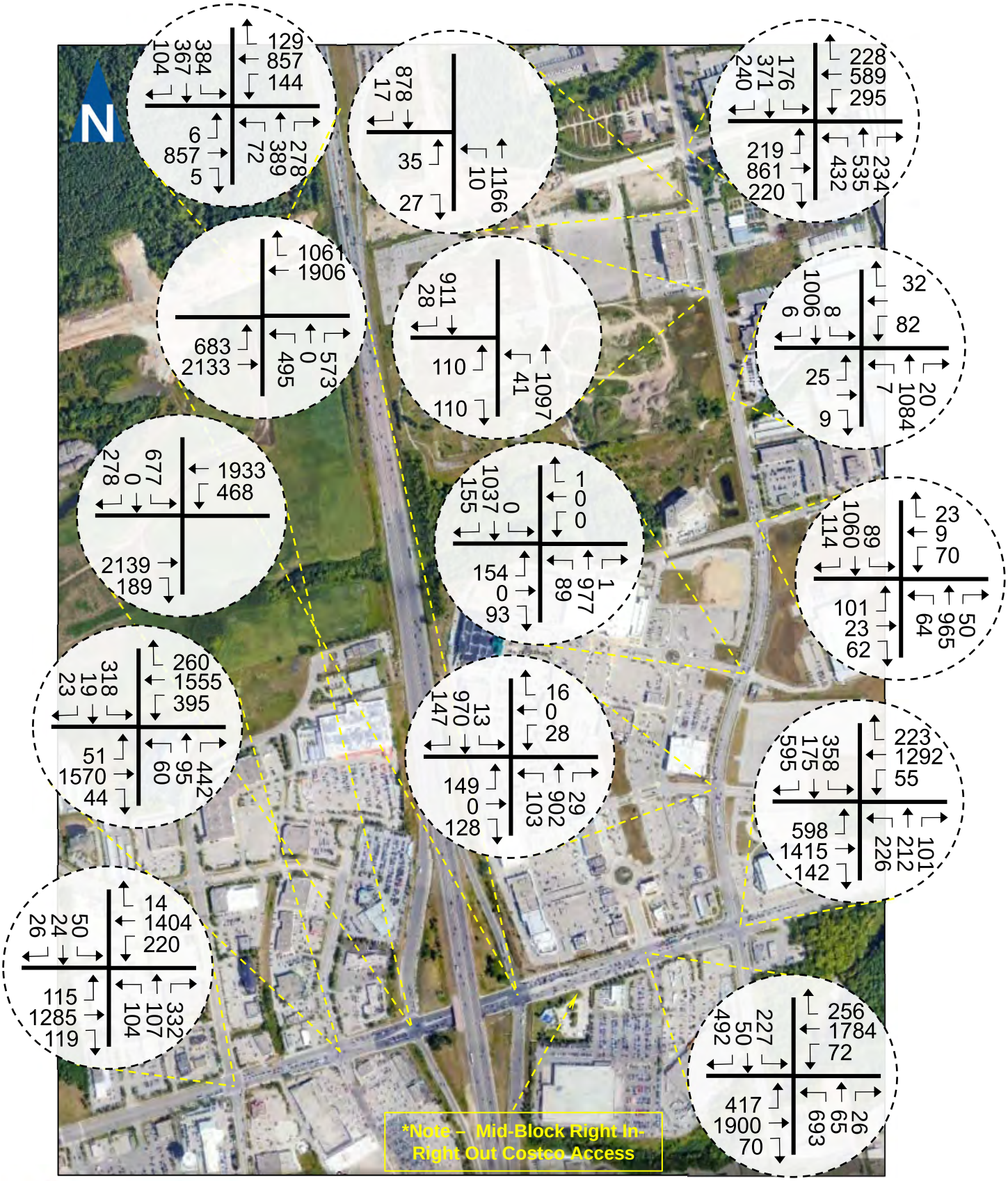
2031 Total Traffic
PM Peak Hour

Figure 4.12



2036 Total Traffic AM Peak Hour

Figure 4.13



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 build-out of Park Place North Lands). V/C ratios greater than the MTO criteria are highlighted. **Appendix B** 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 have very few 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 C** 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 (v/c of 0.85) 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 (46 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	47	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	67	0.81
		Dual Thru-Thru/Right	A	10	0.68	B	16	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	28	0.71	C	29	0.79
		Right	B	15	0.25	B	15	0.32
	WB	Left	D	43	0.96	D	46	0.94
		Triple Thru	A	9	0.48	A	10	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***	***0.95***	***C***	***29***	***0.95***
Mapleview Dr./ HWY 400 NB Off/On Ramp *Signalized*	EB	Dual Left	D	39	0.69	D	55	0.97
		Triple Thru	A	4	0.45	B	12	0.54
	WB	Triple Thru	A	5	0.59	C	24	0.71
		Right	D	40	0.55	F	96	1.13
	NB	Dual Left	D	45	0.59	D	55	0.77
		Dual Right	D	46	0.62	E	63	0.85
	Overall Intersection		***B***	***17***	***0.61***	***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	39	0.69	D	55	0.97
		Triple Thru	A	4	0.45	B	12	0.54
	WB	Triple Thru	A	6	0.59	C	23	0.71
		Right (Channel/Yield)	A	1	0.52	A	1	0.71
	NB	Dual Left	D	45	0.59	D	55	0.77
		Dual Right	D	46	0.62	E	63	0.85
	Overall Intersection		***B***	***11***	***0.63***	***C***	***25***	***0.85***
Mapleview Dr./ Park Place Blvd. *Signalized*	EB	Dual Left	E	62	0.51	F	138	1.09
		Triple Thru	A	5	0.53	E	56	1.04
		Right	A	9	0.02	A	7	0.04
	WB	Left	B	11	0.02	D	35	0.43
		Triple Thru	B	19	0.92	E	61	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		***B***	***19***	***0.71***	***E***	***70***	***1.06***
Mapleview Dr./ Park Place Blvd. *Mitigation* *Signalized*	EB	Dual Left	E	59	0.51	E	76	0.83
		Triple Thru	A	4	0.50	C	24	0.90
		Right	A	8	0.02	A	2	0.04
	WB	Left	A	9	0.02	C	34	0.43
		Triple Thru	B	14	0.85	D	44	0.94
		Right	A	2	0.05	C	20	0.22
	NB	Dual Left	D	48	0.56	E	60	0.91
		Thru/Right	D	44	0.07	D	37	0.16
	SB	Left	D	53	0.28	F	99	0.93
		Thru	D	52	0.13	D	52	0.22
		Right (Overlap)	D	35	0.10	F	85	0.97
	Overall Intersection		***B***	***16***	***0.71***	***D***	***46***	***0.95***
Mapleview Dr./ Bayview Dr. *Signalized*	EB	Dual Left	E	71	0.82	E	72	0.83
		Triple Thru	B	15	0.38	B	17	0.53
		Right	B	15	0.27	B	16	0.21
	WB	Left	C	21	0.24	C	24	0.36
		Dual Thru-Thru/Right	D	40	0.88	D	35	0.65
	NB	Dual Left	E	67	0.79	E	65	0.76
		Thru-Thru/Right	C	34	0.06	D	49	0.37
	SB	Left	C	26	0.48	D	42	0.73
		Dual Thru	C	32	0.18	D	44	0.25
		Right (Channelized)	E	56	0.86	E	68	0.83
	Overall Intersection		***D***	***37***	***0.86***	***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	8	0.39	A	11	0.45
	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	0.31
	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	D	42	0.13	D	42	0.05
	NB	Left	A	7	0.12	B	13	0.18
		Thru-Thru/Right	A	9	0.19	B	19	0.46
	SB	Left	A	6	0.10	B	13	0.21
		Thru-Thru/Right	B	11	0.42	C	21	0.56
	Overall Intersection		***B***	***15***	***0.37***	***C***	***22***	***0.44***
Bayview Dr./Coca Cola D/W *Unsignalized*	WB	Left/Right	B	13	0.04	C	15	0.21
	NB	Thru-Thru/Right	Unopposed Movement			Unopposed Movement		
	SB	Left	A	9	0.01	A	9	0.01
		Dual Thru	Unopposed Movement			Unopposed Movement		
Bayview Dr./ Medical Centre South D/W *Unsignalized*	EB	Left	B	15	0.01	B	15	0.02
		Right	B	11	0.04	B	11	0.15
	NB	Left	A	10	0.12	A	9	0.04
		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	13	0.03	B	13	0.12
	NB	Left	A	9	0.03	A	9	0.01
		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./ Big Bay Point Road *Signalized*	EB	Left	B	20	0.47	C	25	0.58
		Dual Thru	C	29	0.51	D	37	0.68
		Right	C	28	0.40	C	30	0.22
	WB	Left	B	19	0.56	C	30	0.69
		Dual Thru	C	28	0.48	C	33	0.45
		Right	C	25	0.22	C	29	0.09
	NB	Left	C	23	0.20	C	26	0.64
		Thru-Thru/Right	C	29	0.30	C	33	0.47
	SB	Left	C	24	0.15	C	29	0.28
		Dual Thru	C	29	0.18	D	38	0.35
		Right	C	29	0.15	D	37	0.23
	Overall Intersection		***C***	***27***	***0.45***	***C***	***33***	***0.68***
Bryne Dr./ Harvie Road *Signalized*	EB	Left	B	19	0.01	C	31	0.02
		Dual Thru	C	22	0.23	D	37	0.50
		Right	B	19	0.00	C	30	0.00
	WB	Left	C	21	0.12	D	39	0.37
		Dual Thru	C	21	0.13	D	36	0.46
		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***	***0.20***	***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. **Appendix B** also contains the SimTraffic output related to the queue analysis.

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	22	18	9	31	22	18	11	29
		Dual Thru-Thru/Right	260	87	173	49	211	64	196	36	224
	WB	Left	40 TWLTL	37	3	31	9	37	3	20	20
		Dual Thru-Thru/Right	160	99	61	52	108	13	147	5	155
	NB	Left	65	32	33	16	49	37	28	21	44
		Thru-Thru/Right	100	21	79	10	90	63	37	33	67
	SB	Left	40 TWLTL	39	1	5	35	38	2	20	20
		Thru-Thru/Right	330	23	307	20	310	26	304	13	317
Mapleview Dr./ Barrie View Dr. *Signalized*	EB	Left	80 TWLTL	16	64	4	76	31	49	8	72
		Triple Thru-Thru/Right	160	65	95	34	126	93	67	62	98
	WB	Dual Left	65	66	-1	45	20	65	0	41	24
		Dual Thru-Thru/Right	100	87	13	54	46	101	-1	60	40
	NB	Left	35	4	31	1	34	19	16	7	28
		Thru	50	9	41	3	47	22	28	10	40
		Right	50	40	10	22	28	105	-55	88	-38
	SB	Left	35	54	-19	43	-8	53	-18	46	-11
		Thru-Thru/Right	290	120	170	45	245	160	130	77	213

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	125	-25	73	27	100	0	61	39
		Right	55	63	-8	22	33	25	30	10	45
	WB	Left	130	108	22	63	67	90	40	53	77
		Triple Thru	165	74	91	40	125	54	111	40	125
	SB	Dual Left	530	387	143	270	260	378	152	345	185
		Dual Right	530	377	153	170	360	430	100	315	215
Mapleview Dr./ HWY 400 NB Off/On Ramp *Signalized*	EB	Dual Left	135	51	84	27	108	124	11	75	60
		Triple Thru	165	53	112	13	152	98	67	50	115
	WB	Triple Thru	205	124	81	64	141	151	54	63	142
		Right	150	89	61	56	94	189	-39	131	19
	NB	Dual Left	560	54	506	33	527	82	478	56	504
		Dual Right	560	50	510	28	532	78	482	52	508
Mapleview Dr./ HWY 400 NB Off/On Ramp *Mitigation* *Signalized*	EB	Dual Left	135	48	87	27	108	149	-14	95	40
		Triple Thru	165	58	107	17	148	107	58	45	120
	WB	Triple Thru	205	168	37	84	121	111	94	68	137
		Right (Channel-Yield)	150	29	121	8	142	82	68	51	99
	NB	Dual Left	560	56	504	31	529	107	453	61	499
		Dual Right	560	54	506	31	529	81	479	54	506
Mapleview Dr./ Park Place Blvd. *Signalized*	EB	Dual Left	165	50	115	35	130	77	88	53	112
		Triple Thru	205	62	143	40	165	138	67	82	123
		Right	185	8	177	2	183	11	174	4	181
	WB	Left	60	15	45	2	58	41	19	14	46
		Triple Thru	125	164	-39	118	7	148	-23	134	-9
		Right	125	192	-67	71	54	211	-86	144	-19
	NB	Dual Left	65	48	17	29	36	137	-72	134	-69
		Thru/Right	65	14	51	5	60	181	-116	84	-19
	SB	Left	65	13	52	5	60	70	-5	43	22
		Thru	85	7	78	2	83	127	-42	55	30
		Right	85	39	46	22	63	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	35	130	63	102	44	121
		Triple Thru	205	57	148	36	169	84	121	57	148
		Right	185	7	178	2	183	11	174	4	181
	WB	Left	60	10	50	1	59	43	17	15	45
		Triple Thru	125	161	-36	102	23	151	-26	130	-5
		Right	125	144	-19	42	83	216	-91	118	7
	NB	Dual Left	65	49	16	29	36	136	-71	134	-69
		Thru/Right	65	13	52	5	60	178	-113	85	-20
	SB	Left	65	16	49	6	59	78	-13	53	12
		Thru	85	8	77	2	83	132	-47	60	25
		Right (Overlap)	85	40	45	22	63	123	-38	92	-7
Mapleview Dr./ Bayview Dr. *Signalized*	EB	Dual Left	80	62	18	42	38	75	5	53	27
		Triple Thru	125	32	93	17	108	50	75	31	94
		Right	45	46	-1	25	20	34	11	19	26
	WB	Left	125	69	56	18	107	22	103	8	117
		Dual Thru-Thru/Right	705	320	385	224	481	310	395	251	454
	NB	Dual Left	150	70	80	39	111	74	76	47	103
		Thru-Thru/Right	80	16	64	6	74	44	36	24	56
	SB	Left	100	86	14	49	51	111	-11	66	34
		Dual Thru	210	92	118	35	175	220	-10	103	107
		Right (Channelized)	65	91	-26	51	14	103	-38	69	-4

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	18	47	8	57	43	22	25	40
	WB	Left	50	16	34	5	45	19	31	6	44
		Thru/Right	50	5	45	1	49	11	39	3	47
	NB	Left	45	23	22	10	35	27	18	13	32
		Thru-Thru/Right	210	34	176	12	198	56	154	24	186
	SB	Left	40	3	37	1	39	11	29	2	38
		Thru-Thru/Right	185	78	107	35	150	110	75	55	130
Bayview Dr./ North Village Way *Signalized*	EB	Left	45	19	26	8	37	40	5	25	20
		Thru	85	0	85	0	85	23	62	3	82
		Right	45	23	22	8	37	28	17	16	29
	WB	Left	60	6	54	1	59	1	59	1	59
		Thru/Right	60	0	60	0	60	3	57	1	59
	NB	Left	50	14	36	6	44	18	32	9	41
		Thru-Thru/Right	185	22	163	6	179	34	151	13	172
	SB	Left	55	4	51	1	54	0	55	1	54
		Thru-Thru/Right	235	55	180	25	210	96	139	47	188
Bayview Dr./ Concert Way-Churchill Dr. *Signalized*	EB	Left	85	15	70	6	79	33	52	16	69
		Thru	130	0	130	0	130	16	114	5	125
		Right	85	12	73	5	80	17	68	8	77
	WB	Left	35	14	21	4	31	25	10	11	24
		Thru/Right	650	34	616	20	630	18	632	7	643
	NB	Left	50	22	28	8	42	33	17	11	39
		Thru-Thru/Right	235	26	209	10	225	79	156	46	189
	SB	Left	45	17	28	7	38	47	-2	17	28
		Thru-Thru/Right	200	58	142	30	170	110	90	82	118

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 *Unsignalized*	WB	Left/Right	35	16	19	5	30	30	5	15	20
	NB	Thru-Thru/Right	-	Unopposed Movement				Unopposed Movement			
	SB	Left	50	7	43	2	48	6	44	1	49
		Dual Thru	-	Unopposed Movement				Unopposed Movement			
Bayview Dr./ Medical Centre South D/W *Unsignalized*	EB	Left	35	5	30	1	34	9	26	2	33
		Right	35	13	22	5	30	18	17	11	24
	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	11	24	3	32	19	16	10	25
	NB	Left	25	11	14	3	22	7	18	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	55	-15	30	10	87	-47	52	-12
		Dual Thru	300	103	197	47	253	121	179	73	227
		Right	50	58	-8	29	21	83	-33	38	12
	WB	Left	50	58	-8	33	17	55	-5	33	17
		Dual Thru	745	69	676	46	699	66	679	44	701
		Right	50	34	16	17	33	28	22	12	38
	NB	Left	50	29	21	15	35	88	-38	56	-6
		Thru-Thru/Right	200	56	144	33	167	84	116	55	145
	SB	Left	65	21	44	10	55	27	38	15	50
		Dual Thru	650	39	611	21	629	52	598	31	619
		Right	65	40	25	21	44	63	2	33	32

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	4	56	1	59
		Dual Thru	300	45	255	27	273	75	225	51	249
		Right	60	5	55	1	59	4	56	1	59
	WB	Left	60	24	36	10	50	35	25	18	42
		Dual Thru	300	31	269	15	285	62	238	42	258
		Right	60	27	33	12	48	14	46	5	55
	NB	Left	60	8	52	2	58	17	43	7	53
		Dual Thru	300	25	275	13	287	37	263	23	277
		Right	60	12	48	6	54	12	48	5	55
	SB	Left	60	28	32	15	45	66	-6	42	18
		Dual Thru	300	44	256	26	274	46	254	21	279
		Right	60	13	47	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 D** 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 Park Place North Lands industrial 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 (v/c of 0.83) 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 1.18);
- With a southbound right turn overlap phase as previously described, the overall intersection operation and the southbound right turn movement would operate within capacity (v/c of 0.95 and 0.97, respectively). The overall intersection level of service improves 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.

The industrial site access driveway intersections with Bayview Avenue are forecast to operate well within capacity 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	0.25
		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***

5.1.5 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. **Appendix D** also contains the SimTraffic output related to the queue analysis.

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. It is noted the proposed industrial development is forecast to contribute 10 and eight vehicle trips to the northbound right turn movement on this ramp under the AM and PM peak hours, respectively.

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. It should also be noted the proposed industrial development will not contribute any traffic to the southbound left turn movement or the southbound right turn movement on this ramp.

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	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	133	279	251	378	152	345	185
		Dual Right	530	337	193	200	330	426	104	223	307
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	502	34	526	86	474	59	501
		Dual Right	560	50	510	29	531	82	478	52	508
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	508	30	530	83	477	58	502
		Dual Right	560	57	503	33	527	78	482	53	507
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		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

5.1.6 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 E** 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 (v/c of 1.31);
- 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 (43 seconds versus 69 seconds), a better level of service (D versus E), and the southbound right turn movement operating within capacity (v/c of 0.99), 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	7	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	57	0.69	E	73	0.76
		Dual Thru-Thru/Right	A	7	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***	***15***	***0.76***	***C***	***27***	***0.73***
Mapleview Dr./ HWY 400 SB Off/On Ramp *Signalized*	EB	Quad Thru	C	20	0.68	C	24	0.79
		Right	A	7	0.19	A	9	0.20
	WB	Left	D	46	0.94	D	42	0.93
		Triple Thru	B	10	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***	***0.92***
Mapleview Dr./ HWY 400 NB Off/On Ramp *Signalized*	EB	Dual Left	D	37	0.67	D	51	0.95
		Triple Thru	A	7	0.50	B	15	0.58
	WB	Triple Thru	A	5	0.62	C	20	0.76
		Right	D	39	0.51	D	38	0.97
	NB	Dual Left	D	47	0.74	D	50	0.67
		Dual Right	D	40	0.35	E	67	0.90
	Overall Intersection		***B***	***17***	***0.66***	***C***	***30***	***0.95***

Intersection	Approach/Movement		AM Peak Hour			PM Peak Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
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	0.70	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	18	0.18	C	27	0.45
	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	141	1.11
		Triple Thru	A	5	0.50	C	31	0.97
		Right	A	9	0.02	A	4	0.04
	WB	Left	A	9	0.08	D	36	0.49
		Triple Thru	B	19	0.96	E	71	1.07
		Right	A	1	0.06	B	17	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	E	57	0.71
		Thru	D	47	0.07	D	45	0.15
		Right	D	48	0.11	F	214	1.31
	Overall Intersection		***B***	***20***	***0.72***	***E***	***69***	***1.06***
Mapleview Dr./ Park Place Blvd. *Mitigation* *Signalized*	EB	Dual Left	E	57	0.50	F	84	0.89
		Triple Thru	A	5	0.48	B	17	0.85
		Right	A	7	0.02	A	2	0.04
	WB	Left	A	8	0.08	C	35	0.50
		Triple Thru	B	15	0.89	D	40	0.98
		Right	A	1	0.06	B	12	0.25
	NB	Dual Left	D	48	0.48	E	63	0.89
		Thru/Right	D	45	0.09	D	42	0.21
	SB	Left	D	54	0.34	F	85	0.89
		Thru	D	51	0.12	D	50	0.19
		Right (Overlap)	C	33	0.11	F	86	0.99
	Overall Intersection		***B***	***17***	***0.72***	***D***	***43***	***0.96***

Intersection	Approach/Movement		AM Peak Hour			PM Peak Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
Mapleview Dr./ Bayview Dr. *Signalized*	EB	Dual Left	F	96	0.97	E	80	0.92
		Triple Thru	B	15	0.41	B	18	0.54
		Right	B	15	0.20	B	18	0.11
	WB	Left	C	21	0.20	C	26	0.27
		Dual Thru-Thru/Right	D	52	0.98	D	45	0.85
	NB	Dual Left	D	52	0.51	E	76	0.82
		Thru-Thru/Right	C	33	0.04	D	47	0.41
	SB	Left	D	36	0.76	E	71	0.94
		Dual Thru	C	31	0.20	D	40	0.20
		Right (Channelized)	E	57	0.88	E	78	0.92
	Overall Intersection		***D***	***44***	***0.95***	***D***	***47***	***0.93***
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***	***0.42***	***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	0.12	A	7	0.27
		Thru-Thru/Right	A	5	0.19	A	6	0.38
	SB	Left	A	4	0.01	A	< 1	0.00
		Thru-Thru/Right	A	8	0.45	B	13	0.54
	Overall Intersection		***A***	***8***	***0.42***	***B***	***13***	***0.56***
Bayview Dr./ Concert Way-Churchill Dr. *Signalized*	EB	Left	D	41	0.21	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	0.14	D	42	0.05
	NB	Left	A	8	0.15	B	15	0.22
		Thru-Thru/Right	A	10	0.20	C	21	0.54
	SB	Left	A	6	0.12	B	15	0.31
		Thru-Thru/Right	B	12	0.50	C	22	0.62
	Overall Intersection		***B***	***16***	***0.42***	***C***	***23***	***0.50***

Intersection	Approach/Movement		AM Peak Hour			PM Peak Hour		
			LOS	Delay	V/C	LOS	Delay	V/C
Bayview Dr./Coca Cola D/W *Unsignalized*	WB	Left/Right	B	14	0.05	C	17	0.26
	NB	Thru-Thru/Right	Unopposed Movement			Unopposed Movement		
	SB	Left	A	9	0.01	A	10	0.01
		Dual Thru	Unopposed Movement			Unopposed Movement		
Bayview Dr./ Medical Centre South D/W *Unsignalized*	EB	Left	C	18	0.04	C	18	0.14
		Right	B	12	0.05	B	12	0.19
	NB	Left	B	11	0.17	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	14	0.04	B	14	0.14
	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	22	0.38	C	33	0.72
		Dual Thru	C	31	0.57	D	42	0.79
		Right	C	29	0.42	C	32	0.23
	WB	Left	C	25	0.79	D	55	0.90
		Dual Thru	C	22	0.44	C	35	0.52
		Right	B	20	0.21	C	32	0.26
	NB	Left	C	28	0.26	C	28	0.68
		Thru-Thru/Right	C	34	0.39	D	37	0.62
	SB	Left	C	27	0.17	C	34	0.60
		Dual Thru	C	32	0.23	D	39	0.41
		Right	C	34	0.25	D	36	0.16
	Overall Intersection		***C***	***28***	***0.66***	***D***	***38***	***0.82***
Bryne Dr./ Harvie Road *Signalized*	EB	Left	B	18	0.02	C	23	0.02
		Dual Thru	C	22	0.33	C	30	0.50
		Right	B	18	0.01	C	23	0.00
	WB	Left	C	21	0.23	D	38	0.52
		Dual Thru	C	20	0.22	C	29	0.47
		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	0.15
	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***	***20***	***0.28***	***C***	***24***	***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. **Appendix E** also contains the SimTraffic output related to the queue analysis.

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	35	5	11	29	36	4	16	24
		Dual Thru-Thru/Right	260	94	166	60	200	79	181	55	205
	WB	Left	40 TWLTL	35	5	31	9	51	-11	31	9
		Dual Thru-Thru/Right	160	98	62	56	104	22	138	8	152
	NB	Left	65	46	19	46	19	33	32	18	47
		Thru-Thru/Right	100	15	85	15	85	65	35	36	64
	SB	Left	40 TWLTL	20	20	20	20	24	16	11	29
		Thru-Thru/Right	330	29	301	29	301	14	316	5	325
Mapleview Dr./ Barrie View Dr. *Signalized*	EB	Left	80 TWLTL	20	60	7	73	38	42	13	67
		Triple Thru-Thru/Right	160	69	91	31	129	105	55	65	95
	WB	Dual Left	65	57	8	41	24	60	5	40	25
		Dual Thru-Thru/Right	100	79	21	51	49	63	37	35	65
	NB	Left	35	7	28	1	34	25	10	11	24
		Thru	50	6	44	1	49	36	14	18	32
		Right	50	37	13	20	30	105	-55	71	-21
	SB	Left	35	55	-20	41	-6	53	-18	45	-10
		Thru-Thru/Right	290	110	180	38	252	179	111	81	209

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	122	-22	73	27	126	-26	81	19
		Right	55	39	16	12	43	44	11	11	44
	WB	Left	130	107	23	61	69	118	12	62	68
		Triple Thru	165	91	74	50	115	85	80	48	117
	SB	Dual Left	530	263	267	157	373	400	130	287	243
		Dual Right	530	126	404	57	473	367	163	153	377
Mapleview Dr./ HWY 400 NB Off/On Ramp *Signalized*	EB	Dual Left	135	44	91	25	110	100	35	58	77
		Triple Thru	165	61	104	15	150	106	59	45	120
	WB	Triple Thru	205	84	121	46	159	119	86	73	132
		Right	150	74	76	49	101	143	7	97	53
	NB	Dual Left	560	70	490	44	516	75	485	48	512
		Dual Right	560	41	519	24	536	94	466	65	495
Mapleview Dr./ HWY 400 SB Off/On Ramp DDI *Signalized*	EB	Triple Thru	100	33	67	33	67	36	64	30	70
	WB	Triple Thru	165	53	112	40	125	51	114	46	119
	N-E Ramp		530	67	463	50	480	68	462	54	476
	N-W Ramp		530	66	464	55	475	50	480	29	501
Mapleview Dr./ HWY 400 NB Off/On Ramp DDI *Signalized*	EB	Triple Thru	165	65	100	58	107	66	99	59	106
	WB	Triple Thru	205	43	162	37	168	45	160	37	168
	S-E Ramp		560	42	518	23	537	71	489	52	508
	S-W Ramp		560	65	495	44	516	71	489	55	505
Mapleview Dr./ Park Place Blvd. *Signalized*	EB	Dual Left	165	55	110	38	127	101	64	69	96
		Triple Thru	205	53	152	35	170	139	66	83	122
		Right	185	9	176	2	183	34	151	5	180
	WB	Left	60	22	38	5	55	44	16	17	43
		Triple Thru	125	159	-34	112	13	151	-26	117	8
		Right	125	166	-41	56	69	190	-65	77	48
	NB	Dual Left	65	42	23	24	41	155	-90	129	-64
		Thru/Right	65	16	49	6	59	149	-84	57	8
	SB	Left	65	15	50	5	60	73	-8	47	18
		Thru	85	9	76	2	83	130	-45	57	28
		Right	85	44	41	24	61	105	-20	100	-15

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	52	113	38	127	188	-23	102	63
		Triple Thru	205	51	154	32	173	176	29	77	128
		Right	185	7	178	2	183	9	176	3	182
	WB	Left	60	24	36	5	55	37	23	14	46
		Triple Thru	125	151	-26	100	25	161	-36	108	17
		Right	125	139	-14	41	84	176	-51	67	58
	NB	Dual Left	65	42	23	24	41	143	-78	133	-68
		Thru/Right	65	15	50	6	59	177	-112	87	-22
	SB	Left	65	17	48	7	58	79	-14	56	9
		Thru	85	9	76	3	82	128	-43	57	28
		Right (Overlap)	85	44	41	23	62	117	-32	96	-11
Mapleview Dr./ Bayview Dr. *Signalized*	EB	Dual Left	80	69	11	46	34	94	-14	69	11
		Triple Thru	125	28	97	14	111	81	44	35	90
		Right	45	35	10	17	28	31	14	15	30
	WB	Left	125	60	65	15	110	19	106	7	118
		Dual Thru-Thru/Right	705	305	400	235	470	304	401	252	453
	NB	Dual Left	150	40	110	21	129	78	72	45	105
		Thru-Thru/Right	80	17	63	6	74	55	25	31	49
	SB	Left	100	135	-35	114	-14	129	-29	115	-15
		Dual Thru	210	284	-74	187	23	286	-76	161	49
		Right (Channelized)	65	96	-31	49	16	101	-36	62	3

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	9	56	52	13	30	35
	WB	Left	50	18	32	6	44	26	24	10	40
		Thru/Right	50	6	44	1	49	11	39	3	47
	NB	Left	45	23	22	11	34	39	6	19	26
		Thru-Thru/Right	210	40	170	13	197	75	135	35	175
	SB	Left	40	25	15	4	36	33	7	7	33
		Thru-Thru/Right	185	189	-4	79	106	173	12	87	98
Bayview Dr./ North Village Way *Signalized*	EB	Left	45	18	27	8	37	40	5	25	20
		Thru	85	0	85	0	85	12	73	1	84
		Right	45	23	22	9	36	38	7	19	26
	WB	Left	60	8	52	2	58	0	60	0	60
		Thru/Right	60	0	60	0	60	3	57	1	59
	NB	Left	50	15	35	6	44	23	27	11	39
		Thru-Thru/Right	185	24	161	7	178	47	138	20	165
	SB	Left	55	16	39	2	53	0	55	0	55
		Thru-Thru/Right	235	154	81	51	184	126	109	62	173
Bayview Dr./ Concert Way-Churchill Dr. *Signalized*	EB	Left	85	15	70	6	79	33	52	14	71
		Thru	130	0	130	0	130	16	114	6	124
		Right	85	12	73	5	80	18	67	8	77
	WB	Left	35	20	15	8	27	29	6	14	21
		Thru/Right	650	34	616	20	630	15	635	6	644
	NB	Left	50	28	22	11	39	23	27	9	41
		Thru-Thru/Right	235	32	203	13	222	85	150	56	179
	SB	Left	45	36	9	12	33	33	12	15	30
		Thru-Thru/Right	200	114	86	43	157	99	101	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*	WB	Left/Right	100	20	80	6	94	45	55	21	79
	NB	Thru-Thru/Right	-	Unopposed Movement				Unopposed Movement			
	SB	Left	50	7	43	2	48	5	45	1	49
		Dual Thru	-	Unopposed Movement				Unopposed Movement			
Bayview Dr./ Medical Centre South D/W – Industrial D/W North *Unsignalized*	EB	Left	35	10	25	3	32	20	15	9	26
		Right	35	13	22	6	29	22	13	13	22
	NB	Left	35	20	15	12	23	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	25	10	13	22
	NB	Left	25	10	15	3	22	7	18	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	50	-10	25	15	89	-49	54	-14
		Dual Thru	300	83	217	53	247	149	151	84	216
		Right	50	65	-15	31	19	80	-30	34	16
	WB	Left	50	86	-36	54	-4	114	-64	74	-24
		Dual Thru	745	78	667	45	700	218	527	110	635
		Right	50	28	22	15	35	49	1	20	30
	NB	Left	50	35	15	18	32	92	-42	57	-7
		Thru-Thru/Right	200	66	134	41	159	100	100	62	138
	SB	Left	65	23	42	10	55	64	1	36	29
		Dual Thru	650	40	610	24	626	58	592	36	614
		Right		65	0	37	28	42	23	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	8	52	2	58	5	55	1	59
		Dual Thru	300	60	240	39	261	82	218	57	243
		Right	60	7	53	2	58	5	55	1	59
	WB	Left	60	31	29	15	45	58	2	31	29
		Dual Thru	300	40	260	24	276	61	239	38	262
		Right	60	24	36	12	48	13	47	4	56
	NB	Left	60	9	51	3	57	22	38	11	49
		Dual Thru	300	26	274	13	287	44	256	29	271
		Right	60	14	46	7	53	24	36	12	48
	SB	Left	60	38	22	20	40	92	-32	63	-3
		Dual Thru	300	43	257	27	273	157	143	67	233
		Right	60	13	47	6	54	20	40	9	51

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 F** 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 (v/c of 1.26). 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 within capacity (v/c of 0.96), with less delay (52 seconds versus 76 seconds), and the southbound right turn movement operating within capacity (v/c of 0.95); 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 approaching capacity (v/c of 0.97);
- With a channelized right turn design as previously described, the intersection operation would be within capacity (v/c of 0.84) 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 industrial site access driveway intersections with Bayview Avenue are forecast to operate well within capacity 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	0.36
		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***

5.2.5 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. **Appendix F** also contains the SimTraffic output related to the queue analysis.

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 lengthsfor both the AM and PM peak hours. It is noted the proposed industrial development is forecast to contribute 10 and eight vehicle trips to the northbound right turn movement on this ramp under the AM and PM peak hours, respectively.

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. It is noted the proposed industrial development will not contribute any traffic to the southbound left turn movement or the southbound right turn movement on this ramp.

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	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

5.2.6 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 G** 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 (47 seconds versus 82 seconds), a better level of service (D versus F), and the southbound right turn movement operating within capacity (v/c of 0.99), 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 = 1.02) 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	59	0.80	D	42	0.60
		Dual Thru-Thru/Right	A	8	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***	***26***	***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	57	0.70	E	73	0.78
		Dual Thru-Thru/Right	A	8	0.74	B	10	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	21	0.74	C	27	0.86
		Right	A	7	0.21	A	10	0.23
	WB	Left	D	48	0.96	D	41	0.94
		Triple Thru	B	11	0.58	B	11	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***	***25***	***0.95***	***C***	***26***	***0.93***
Mapleview Dr./ HWY 400 NB Off/On Ramp *Signalized*	EB	Dual Left	D	37	0.69	D	50	0.96
		Triple Thru	A	7	0.53	B	15	0.61
	WB	Triple Thru	B	10	0.66	C	21	0.81
		Right	D	45	0.55	D	54	1.03
	NB	Dual Left	D	47	0.74	D	51	0.69
		Dual Right	D	39	0.35	E	69	0.91
	Overall Intersection		***B***	***20***	***0.69***	***C***	***33***	***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	37	0.69	D	39	0.90
		Triple Thru	A	7	0.53	B	11	0.61
	WB	Triple Thru	B	10	0.66	C	23	0.84
		Right (Channel/Yield)	A	1	0.52	A	1	0.67
	NB	Dual Left	D	47	0.74	D	51	0.69
		Dual Right	D	39	0.35	E	69	0.91
	Overall Intersection		***B***	***14***	***0.69***	***C***	***23***	***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***	***30***	***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	20	0.84	C	25	0.90
	WB	Triple Through	C	27	0.75	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	0.19	C	28	0.47
	S-W Ramp (Dual Left)		B	20	0.31	C	21	0.30
Mapleview Dr./ Park Place Blvd. *Signalized*	EB	Dual Left	E	63	0.54	F	175	1.19
		Triple Thru	A	3	0.52	D	48	1.04
		Right	A	9	0.02	A	6	0.04
	WB	Left	A	9	0.09	D	39	0.54
		Triple Thru	C	23	0.98	F	89	1.12
		Right	A	1	0.06	B	18	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		***C***	***21***	***0.74***	***F***	***82***	***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	88	0.94
		Triple Thru	A	3	0.50	C	22	0.89
		Right	A	7	0.02	A	5	0.04
	WB	Left	A	8	0.08	D	40	0.52
		Triple Thru	B	18	0.93	D	47	1.01
		Right	A	1	0.06	B	11	0.26
	NB	Dual Left	D	48	0.50	E	76	0.96
		Thru/Right	D	45	0.08	D	43	0.22
	SB	Left	D	54	0.34	E	76	0.85
		Thru	D	51	0.12	D	49	0.18
		Right (Overlap)	C	34	0.17	F	86	0.99
	Overall Intersection		***B***	***18***	***0.74***	***D***	***47***	***0.99***
Mapleview Dr./ Bayview Dr. *Signalized*	EB	Dual Left	F	97	0.98	E	79	0.93
		Triple Thru	B	18	0.43	B	19	0.58
		Right	C	24	0.21	B	19	0.12
	WB	Left	C	21	0.22	C	27	0.31
		Dual Thru-Thru/Right	E	64	1.02	D	52	0.92
	NB	Dual Left	D	53	0.55	F	81	0.85
		Thru-Thru/Right	C	33	0.04	D	46	0.41
	SB	Left	D	38	0.79	E	76	0.97
		Dual Thru	C	31	0.20	D	39	0.20
		Right (Channelized)	E	62	0.91	F	80	0.94
	Overall Intersection		***D***	***50***	***0.98***	***D***	***50***	***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	0.21	A	10	0.41
	SB	Left	A	6	0.01	A	8	0.04
		Thru-Thru/Right	A	10	0.50	B	14	0.54
	Overall Intersection		***B***	***10***	***0.44***	***B***	***16***	***0.51***
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	0.28
		Thru-Thru/Right	A	5	0.19	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	0.56
	SB	Left	A	6	0.13	B	16	0.33
		Thru-Thru/Right	B	12	0.52	C	23	0.64
	Overall Intersection		***B***	***16***	***0.44***	***C***	***24***	***0.51***
Bayview Dr./Coca Cola D/W *Unsignalized*	WB	Left/Right	B	14	0.05	C	18	0.29
	NB	Thru-Thru/Right	Unopposed Movement			Unopposed Movement		
	SB	Left	A	9	0.02	A	10	0.01
		Dual Thru	Unopposed Movement			Unopposed Movement		
Bayview Dr./ Medical Centre South D/W *Unsignalized*	EB	Left	B	15	0.01	C	18	0.14
		Right	C	18	0.04	B	12	0.19
	NB	Left	B	11	0.17	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	14	0.04	B	14	0.15
	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	24	0.41	C	32	0.73
		Dual Thru	C	35	0.63	D	45	0.83
		Right	C	32	0.46	C	32	0.24
	WB	Left	C	33	0.85	D	50	0.86
		Dual Thru	C	24	0.48	C	34	0.53
		Right	C	22	0.24	C	31	0.27
	NB	Left	C	27	0.25	C	33	0.75
		Thru-Thru/Right	C	34	0.38	D	41	0.70
	SB	Left	C	28	0.18	D	39	0.70
		Dual Thru	C	33	0.23	D	40	0.44
		Right	D	35	0.26	D	37	0.17
	Overall Intersection		***C***	***31***	***0.69***	***D***	***39***	***0.85***

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	20	0.03
		Dual Thru	B	17	0.37	C	28	0.56
		Right	B	13	0.01	B	20	0.00
	WB	Left	B	18	0.32	E	62	0.81
		Dual Thru	B	16	0.28	C	27	0.54
		Right	B	14	0.11	C	21	0.08
	NB	Left	C	25	0.05	B	19	0.16
		Dual Thru	C	25	0.09	B	19	0.23
		Right	C	25	0.07	C	21	0.32
	SB	Left	C	30	0.36	D	47	0.86
		Dual Thru	C	27	0.22	B	19	0.22
		Right	C	25	0.06	B	17	0.08
	Overall Intersection		***B***	***20***	***0.37***	***C***	***28***	***0.84***

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. **Appendix G** also contains the SimTraffic output related to the queue analysis.

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	32	8	10	30	44	-4	20	20
		Dual Thru-Thru/Right	260	101	159	68	192	93	167	62	198
	WB	Left	40 TWLTL	36	4	31	9	58	-18	35	5
		Dual Thru-Thru/Right	160	103	57	66	94	36	124	10	150
	NB	Left	65	46	19	23	42	35	30	19	46
		Thru-Thru/Right	100	18	82	6	94	79	21	43	57
	SB	Left	40 TWLTL	23	17	9	31	25	15	12	28
		Thru-Thru/Right	330	32	298	16	314	16	314	7	323
Mapleview Dr./ Barrie View Dr. *Signalized*	EB	Left	80 TWLTL	22	58	7	73	39	41	15	65
		Triple Thru-Thru/Right	160	67	93	33	127	103	57	66	94
	WB	Dual Left	65	59	6	42	23	61	4	40	25
		Dual Thru-Thru/Right	100	87	13	56	44	80	20	45	55
	NB	Left	35	5	30	1	34	27	8	12	23
		Thru	50	7	43	2	48	45	5	21	29
		Right	50	40	10	21	29	110	-60	79	-29
	SB	Left	35	54	-19	42	-7	50	-15	47	-12
		Thru-Thru/Right	290	104	186	39	251	224	66	127	163

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	130	-30	84	16	125	-25	80	20
		Right	55	51	4	15	40	35	20	9	46
	WB	Left	130	106	24	64	66	97	33	57	73
		Triple Thru	165	82	83	52	113	65	100	47	118
	SB	Dual Left	530	353	177	207	323	426	104	278	252
		Dual Right	530	276	254	112	418	395	135	240	290
Mapleview Dr./ HWY 400 NB Off/On Ramp *Signalized*	EB	Dual Left	135	46	89	25	110	133	2	80	55
		Triple Thru	165	60	105	16	149	122	43	52	113
	WB	Triple Thru	205	133	72	40	165	92	113	65	140
		Right	150	96	54	63	87	155	-5	109	41
	NB	Dual Left	560	72	488	46	514	72	488	49	511
		Dual Right	560	43	517	23	537	94	466	65	495
Mapleview Dr./ HWY 400 NB Off/On Ramp *Mitigation* *Signalized*	EB	Dual Left	135	45	90	25	110	85	50	50	85
		Triple Thru	165	49	116	12	153	77	88	23	142
	WB	Triple Thru	205	153	52	81	124	139	66	90	115
		Right (Channel-Yield)	150	32	118	8	142	77	73	46	104
	NB	Dual Left	560	74	486	46	514	78	482	52	508
		Dual Right	560	46	514	25	535	102	458	69	491
Mapleview Dr./ HWY 400 SB Off/On Ramp DDI *Signalized*	EB	Triple Thru	100	30	70	25	75	37	63	30	70
	WB	Triple Thru	165	53	112	42	123	51	114	46	119
	N-E Ramp		530	66	464	51	479	66	464	56	474
	N-W Ramp		530	67	463	54	476	46	484	29	501
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	46	159	37	168	45	160	37	168
	S-E Ramp		560	44	516	25	535	73	487	51	509
	S-W Ramp		560	67	493	47	513	71	489	55	505

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	66	99	43	122	153	12	88	77
		Triple Thru	205	53	152	31	174	167	38	95	110
		Right	185	8	177	2	183	12	173	4	181
	WB	Left	60	24	36	5	55	47	13	17	43
		Triple Thru	125	164	-39	113	12	153	-28	128	-3
		Right	125	164	-39	54	71	216	-91	113	12
	NB	Dual Left	65	44	21	25	40	146	-81	132	-67
		Thru/Right	65	17	48	7	58	176	-111	82	-17
	SB	Left	65	15	50	5	60	68	-3	41	24
		Thru	85	8	77	2	83	128	-43	56	29
		Right	85	46	39	25	60	101	-16	101	-16
Mapleview Dr./ Park Place Blvd. *Mitigation* *Signalized*	EB	Dual Left	165	58	107	41	124	104	61	60	105
		Triple Thru	205	46	159	29	176	107	98	64	141
		Right	185	8	177	2	183	11	174	4	181
	WB	Left	60	20	40	4	56	51	9	19	41
		Triple Thru	125	158	-33	93	32	165	-40	123	2
		Right	125	124	1	32	93	213	-88	105	20
	NB	Dual Left	65	43	22	25	40	136	-71	135	-70
		Thru/Right	65	16	49	7	58	183	-118	99	-34
	SB	Left	65	17	48	7	58	74	-9	50	15
		Thru	85	9	76	2	83	117	-32	49	36
		Right (Overlap)	85	42	43	23	62	119	-34	94	-9

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	63	17	43	37	98	-18	73	7
		Triple Thru	125	40	85	22	103	91	34	41	84
		Right	45	46	-1	23	22	27	18	13	32
	WB	Left	125	67	58	16	109	18	107	7	118
		Dual Thru-Thru/Right	705	305	400	248	457	294	411	251	454
	NB	Dual Left	150	38	112	20	130	80	70	49	101
		Thru-Thru/Right	80	15	65	5	75	54	26	32	48
	SB	Left	100	127	-27	116	-16	139	-39	110	-10
		Dual Thru	210	277	-67	202	8	279	-69	155	55
		Right (Channelized)	65	98	-33	51	14	97	-32	64	1
Bayview Dr./ South Village Way *Signalized*	EB	Left/Thru-Thru/Right	65	26	39	9	56	55	10	30	35
	WB	Left	50	37	13	12	38	31	19	11	39
		Thru/Right	50	8	42	2	48	11	39	4	46
	NB	Left	45	25	20	11	34	39	6	19	26
		Thru-Thru/Right	210	39	171	14	196	74	136	35	175
	SB	Left	40	37	3	7	33	31	9	6	34
		Thru-Thru/Right	185	262	-77	150	35	182	3	92	93

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	19	26	9	36	40	5	25	20
		Thru	85	0	85	0	85	18	67	2	83
		Right	45	28	17	11	34	34	11	18	27
	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	14	36	6	44	22	28	10	40
		Thru-Thru/Right	185	29	156	10	175	46	139	20	165
	SB	Left	55	26	29	3	52	0	55	0	55
		Thru-Thru/Right	235	235	0	100	135	128	107	64	171
Bayview Dr./ Concert Way-Churchill Dr. *Signalized*	EB	Left	85	17	68	8	77	32	53	17	68
		Thru	130	0	130	0	130	14	116	5	125
		Right	85	13	72	5	80	19	66	9	76
	WB	Left	35	18	17	8	27	26	9	13	22
		Thru/Right	650	36	614	22	628	15	635	5	645
	NB	Left	50	20	30	7	43	33	17	11	39
		Thru-Thru/Right	235	36	199	15	220	94	141	58	177
	SB	Left	45	39	6	12	33	44	1	18	27
		Thru-Thru/Right	200	120	80	49	151	118	82	84	116
Bayview Dr./Coca Cola D/W – Industrial D/W South *Unsignalized*	WB	Left/Right	100	18	82	7	93	44	56	22	78
	NB	Thru-Thru/Right	-	Unopposed Movement				Unopposed Movement			
	SB	Left	50	10	40	2	48	6	44	1	49
		Dual Thru	-	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	11	24	4	31	26	9	12	23
		Right	35	13	22	6	29	21	14	13	22
	NB	Left	35	20	15	11	24	15	20	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	100	12	88	4	96	84	16	34	66
	NB	Left	25	12	13	4	21	8	17	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	63	-23	29	11	93	-53	64	-24
		Dual Thru	300	97	203	61	239	200	100	119	181
		Right	50	79	-29	40	10	96	-46	49	1
	WB	Left	50	95	-45	59	-9	90	-40	54	-4
		Dual Thru	745	95	650	54	691	94	651	59	686
		Right	50	41	9	19	31	45	5	19	31
	NB	Left	50	40	10	20	30	107	-57	76	-26
		Thru-Thru/Right	200	80	120	47	153	118	82	87	113
	SB	Left	65	24	41	11	54	96	-31	49	16
		Dual Thru	650	58	592	26	624	106	544	53	597
		Right		67	-2	39	26	53	12	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	68	232	45	255	92	208	66	234
		Right	60	9	51	2	58	6	54	1	59
	WB	Left	60	40	20	21	39	95	-35	74	-14
		Dual Thru	300	54	246	30	270	284	16	151	149
		Right	60	23	37	12	48	32	28	12	48
	NB	Left	60	10	50	3	57	29	31	15	45
		Dual Thru	300	27	273	15	285	48	252	33	267
		Right	60	17	43	8	52	45	15	24	36
	SB	Left	60	49	11	31	29	85	-25	79	-19
		Dual Thru	300	49	251	32	268	191	109	151	149
		Right	60	14	46	7	53	32	28	13	47

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 H** 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 1.10) 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 1.31). 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 0.99), with less delay (58 seconds versus 88 seconds), and the southbound right turn movement operating within capacity (v/c of 0.98); 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 1.03). It is noted that no site generated traffic would be added to this movement;
- 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 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 = 1.08) 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.

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 industrial site access driveway intersections with Bayview Avenue are forecast to operate well within capacity 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	0.20	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***

5.3.5 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. **Appendix H** also contains the SimTraffic output related to the queue analysis.

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. It is noted the proposed industrial development is forecast to contribute 10 and eight vehicle trips to the northbound right turn movement on this ramp under the AM and PM peak hours, respectively.

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. It is noted the proposed industrial development will not contribute any traffic to the southbound left turn movement or the southbound right turn movement on this ramp.

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	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

6 Conclusions and Recommendations

In consideration of the development previously analyzed within the Park Place Stage 2 TIS along with the proposed development of the Park Place North Lands, 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;
- The proposed development of the North Lands consists mainly of industrial land uses consistent with the as of right zoning. The proposed development of the North Lands is anticipated to generate approximately 179 and 181 vehicular trips under the AM and PM peak hours, respectively.

  The proposed industrial development site will connect to the adjacent transportation network via two full movement connections with Bayview Drive. These two unsignalized site intersections are found to operate well and will not require any additional improvements to accommodate the anticipated traffic demands as it is currently served by a continuous centre two-way left turn lane.

  It is acknowledged intersection pedestrian signals (IPS) are currently provided at the Bayview Drive and North Access-Existing Medical Office South Driveway to facilitate pedestrian crossings of Bayview Drive. It is our understanding traffic signals are contemplated by the applicant to better serve the proposed development with the applicant potentially pursuing the installation of traffic signal control at this site access location as development proceeds.

  The overall impact of the proposed North Lands development on the adjacent transportation network is minor. The additional 179 and 181 vehicular trips 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 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 development of the North 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 with the development of the North Lands.

  It is noted the proposed North Lands development would contribute less than 20 vehicular trips to the ramp terminal intersections under both the AM and PM peak hours; 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 development of the Park Place North 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 significant traffic operations and safety benefits 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
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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
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Highway Corridor Management Section – Central Region
Ministry of Transportation
159 Sir William Hearst Avenue, 7th Floor
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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

2026 Background Synchro Analysis

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	59.0	8.0	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	59.0	8.1	27.7	48.3	14.8	48.7	27.5
Queue Length 50th (m)	0.4	12.6	46.5	42.1	0.5	2.2	0.0	65.2	1.5
Queue Length 95th (m)	m1.2	16.2	m57.6	92.5	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.

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	0.46		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		56.7	9.8		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	19.3	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	470	1413	720	757
v/c Ratio	0.71	0.42	0.95	0.48	0.72	0.88
Control Delay	29.5	6.8	43.3	9.3	38.8	45.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.5	6.8	43.3	9.3	38.8	45.7
Queue Length 50th (m)	85.8	14.7	80.0	72.9	72.4	82.2
Queue Length 95th (m)	#98.0	m7.8	#144.5	70.0	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)	1818	577	546	2931	1071	916
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	94	0	1
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.42	0.86	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	470	1413	0	0	0	0	720	0	757
Future Volume (vph)	0	1297	240	470	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	189	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	470	1413	0	0	0	0	720	0	757
RTOR Reduction (vph)	0	0	128	0	0	0	0	0	0	0	0	48
Lane Group Flow (vph)	0	1297	112	470	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)		32.2	32.2	65.3	65.3					32.7		32.7
Effective Green, g (s)		32.2	32.2	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)		1822	450	492	2932					1000		812
v/s Ratio Prot		0.21		c0.25	0.29					0.21		
v/s Ratio Perm			0.07	c0.31								c0.26
v/c Ratio		0.71	0.25	0.96	0.48					0.72		0.87
Uniform Delay, d1		34.8	29.7	30.8	12.7					34.6		36.7
Progression Factor		0.74	0.47	0.54	0.67					1.00		1.00
Incremental Delay, d2		2.1	1.2	26.2	0.5					2.5		10.2
Delay (s)		27.9	15.1	42.9	9.0					37.1		46.9
Level of Service		C	B	D	A					D		D
Approach Delay (s)		25.9			17.4			0.0			42.1	
Approach LOS		C			B			A			D	

Intersection Summary

HCM 2000 Control Delay	27.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
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	1588	762	295	304
v/c Ratio	0.69	0.45	0.59	0.68	0.58	0.67
Control Delay	41.0	4.2	5.6	7.5	47.7	40.8
Queue Delay	0.0	0.3	0.0	1.0	0.0	0.0
Total Delay	41.0	4.5	5.6	8.5	47.7	40.8
Queue Length 50th (m)	23.4	2.4	17.7	4.6	32.8	29.2
Queue Length 95th (m)	32.3	0.0	m22.3	m46.1	44.1	42.9
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	527	3701	2682	1122	825	703
Starvation Cap Reductn	0	1091	0	157	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	0.59	0.79	0.36	0.43

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	1588	762	295	0	304	0	0	0
Future Volume (vph)	334	1683	0	0	1588	762	295	0	304	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	1588	762	295	0	304	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	317	0	0	58	0	0	0
Lane Group Flow (vph)	334	1683	0	0	1588	445	295	0	246	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	80.9			60.3	60.3	17.1		17.1			
Effective Green, g (s)	16.6	80.9			60.3	60.3	17.1		17.1			
Actuated g/C Ratio	0.15	0.74			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	3703			2682	804	503		398			
v/s Ratio Prot	c0.10	0.33			c0.32		0.09					
v/s Ratio Perm						0.30			c0.10			
v/c Ratio	0.69	0.45			0.59	0.55	0.59		0.62			
Uniform Delay, d1	44.3	5.8			16.6	16.1	43.2		43.4			
Progression Factor	0.81	0.65			0.29	2.37	1.00		1.00			
Incremental Delay, d2	3.0	0.3			0.5	1.4	1.7		2.8			
Delay (s)	38.7	4.0			5.3	39.6	44.9		46.2			
Level of Service	D	A			A	D	D		D			
Approach Delay (s)		9.8			16.4			45.6			0.0	
Approach LOS		A			B			D			A	

Intersection Summary

HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
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	1552	29	3	1963	76	223	30	21	10	165
v/c Ratio	0.51	0.51	0.03	0.01	0.92	0.11	0.56	0.14	0.15	0.07	0.60
Control Delay	65.3	4.4	0.1	6.0	21.0	0.2	51.3	25.6	49.0	46.8	17.0
Queue Delay	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.3	4.4	0.1	6.0	22.6	0.2	51.3	25.6	49.0	46.8	17.0
Queue Length 50th (m)	34.2	8.8	0.0	0.1	48.5	0.0	25.0	2.5	4.6	2.2	0.0
Queue Length 95th (m)	50.3	38.4	m0.0	m0.2	#210.4	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	256	2127	719	1103	558	136	144	274
Starvation Cap Reductn	0	0	0	0	68	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	0.01	0.95	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	1552	29	3	1963	76	223	12	18	21	10	165
Future Volume (vph)	293	1552	29	3	1963	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	291	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	1552	29	3	1963	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	1552	17	3	1963	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	150	2128	647	397	196		137	145	122
v/s Ratio Prot	c0.09	0.32		0.00	c0.40		c0.06	0.01		c0.01	0.01	
v/s Ratio Perm			0.01	0.01		0.02						0.01
v/c Ratio	0.51	0.53	0.02	0.02	0.92	0.05	0.56	0.07		0.15	0.07	0.10
Uniform Delay, d1	41.5	13.1	9.1	16.6	29.1	17.7	46.1	43.5		47.5	47.2	47.3
Progression Factor	1.48	0.30	1.00	0.64	0.50	0.08	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	0.6	0.0	0.0	4.6	0.1	1.8	0.2		0.5	0.2	0.4
Delay (s)	62.2	4.6	9.1	10.7	19.1	1.6	47.9	43.6		48.0	47.4	47.7
Level of Service	E	A	A	B	B	A	D	D		D	D	D
Approach Delay (s)		13.7			18.4			47.4			47.7	
Approach LOS		B			B			D			D	

Intersection Summary

HCM 2000 Control Delay	19.4	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	73.2%	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)	364	826	400	71	1511	173	83	213	149	472
v/c Ratio	0.82	0.37	0.46	0.21	0.85	0.79	0.11	0.51	0.19	0.92
Control Delay	73.8	15.5	3.2	15.6	39.1	75.4	11.6	29.5	31.6	46.2
Queue Delay	0.0	0.0	0.3	0.0	1.5	0.0	0.0	0.0	0.0	0.2
Total Delay	73.8	15.5	3.5	15.6	40.7	75.4	11.6	29.5	31.6	46.4
Queue Length 50th (m)	37.6	33.1	5.8	7.6	121.6	20.2	2.1	32.7	13.5	59.1
Queue Length 95th (m)	#71.9	24.2	13.0	15.9	#155.6	#38.1	8.0	49.5	21.3	#114.4
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)	444	2254	878	343	1776	219	973	419	975	575
Starvation Cap Reductn	0	0	136	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	124	0	0	0	0	5
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.37	0.54	0.21	0.91	0.79	0.09	0.51	0.15	0.83

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	364	826	400	71	1402	109	173	25	58	213	149	472
Future Volume (vph)	364	826	400	71	1402	109	173	25	58	213	149	472
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	3092		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	3092		1029	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)	364	826	400	71	1402	109	173	25	58	213	149	472
RTOR Reduction (vph)	0	0	227	0	8	0	0	45	0	0	0	159
Lane Group Flow (vph)	364	826	173	71	1503	0	173	38	0	213	149	313
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)	15.2	47.7	47.7	44.3	38.4		8.0	24.2		40.4	28.4	28.4
Effective Green, g (s)	15.2	47.7	47.7	44.3	38.4		8.0	24.2		40.4	28.4	28.4
Actuated g/C Ratio	0.14	0.43	0.43	0.40	0.35		0.07	0.22		0.37	0.26	0.26
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)	443	2162	632	299	1714		219	680		444	839	365
v/s Ratio Prot	c0.11	0.17		0.01	c0.31		c0.06	0.01		c0.05	0.05	
v/s Ratio Perm			0.12	0.08						0.12		c0.22
v/c Ratio	0.82	0.38	0.27	0.24	0.88		0.79	0.06		0.48	0.18	0.86
Uniform Delay, d1	46.1	21.1	20.0	20.5	33.6		50.2	33.9		25.4	31.7	38.9
Progression Factor	1.31	0.70	0.69	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	10.4	0.5	0.9	0.4	6.7		17.1	0.0		0.8	0.1	17.6
Delay (s)	70.5	15.2	14.7	20.9	40.3		67.2	33.9		26.2	31.8	56.4
Level of Service	E	B	B	C	D		E	C		C	C	E
Approach Delay (s)		27.7			39.4			56.4			44.3	
Approach LOS		C			D			E			D	

Intersection Summary

HCM 2000 Control Delay	37.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	77.9%	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	445	6	835
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	9.4	0.3	35.4
Queue Length 95th (m)	6.1	8.0	0.0	6.8	31.0	1.5	64.5
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	775	453	2637	788	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	428	17	6	791	44
Future Volume (vph)	31	0	29	14	0	5	54	428	17	6	791	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	3393		1805	3185	
Flt Permitted		0.82		0.47	1.00		0.29	1.00		0.49	1.00	
Satd. Flow (perm)		2644		599	1615		470	3393		939	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	428	17	6	791	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	444	0	6	833	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		409	2384		645	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	0.39	
Uniform Delay, d1		43.7		39.4	38.9		3.6	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	8.4	
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	418	4	863
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	8.9	0.2	36.7
Queue Length 95th (m)	14.9	0.0	4.5	5.9	29.3	1.2	66.6
Internal Link Dist (m)					199.1		252.7
Turn Bay Length (m)	25.0			70.0		70.0	
Base Capacity (vph)	230	455	157	591	2810	862	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	418	0	4	815	48
Future Volume (vph)	35	0	23	4	0	0	46	418	0	4	815	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			0.30	1.00		0.51	1.00	
Satd. Flow (perm)	1687		961	0			563	3406		964	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	418	0	4	815	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	418	0	4	861	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			479	2470		693	2282	
v/s Ratio Prot	c0.02			0.00			c0.00	0.12		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	0.1		0.0	0.5	
Delay (s)	40.2		45.8	54.3			3.3	4.5		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	383	63	863
v/c Ratio	0.15	0.05	0.07	0.29	0.11	0.18	0.09	0.41
Control Delay	34.2	0.2	32.9	1.2	5.8	9.7	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	1.2	5.8	9.7	5.1	11.0
Queue Length 50th (m)	5.1	0.0	2.9	0.0	1.7	19.2	3.7	51.7
Queue Length 95th (m)	13.0	0.0	8.7	0.0	4.6	28.7	8.1	70.5
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	624	262	711	294	2103	693	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	0.18	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	382	1	63	827	36
Future Volume (vph)	30	0	23	17	0	178	29	382	1	63	827	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	3300	
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		323	3404		876	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)	30	0	23	17	0	178	29	382	1	63	827	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	383	0	63	861	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		235	2046		628	2032	
v/s Ratio Prot	c0.01			0.00	0.01		0.00	0.11		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	0.42	
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	0.6	
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			9.2			10.5	
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	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	12	5	524	47	12	768
Future Volume (Veh/h)	12	5	524	47	12	768
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)	12	5	524	47	12	768
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	
vC, conflicting volume	956	286			571	
vC1, stage 1 conf vol	548					
vC2, stage 2 conf vol	408					
vCu, unblocked vol	931	253			542	
tC, single (s)	7.6	6.9			4.2	
tC, 2 stage (s)	6.6					
tF (s)	3.9	3.3			2.3	
p0 queue free %	97	99			99	
cM capacity (veh/h)	385	744			984	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	17	349	222	12	384	384
Volume Left	12	0	0	12	0	0
Volume Right	5	0	47	0	0	0
cSH	449	1700	1700	984	1700	1700
Volume to Capacity	0.04	0.21	0.13	0.01	0.23	0.23
Queue Length 95th (m)	0.9	0.0	0.0	0.3	0.0	0.0
Control Delay (s)	13.3	0.0	0.0	8.7	0.0	0.0
Lane LOS	B			A		
Approach Delay (s)	13.3	0.0		0.1		
Approach LOS	B					

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	31.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	25	100	428	755	7
Future Volume (Veh/h)	2	25	100	428	755	7
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)	2	25	100	428	755	7
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	1172	381	762			
vC1, stage 1 conf vol	758					
vC2, stage 2 conf vol	414					
vCu, unblocked vol	1172	381	762			
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 %	99	96	88			
cM capacity (veh/h)	366	623	859			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	2	25	100	214	214	503	259
Volume Left	2	0	100	0	0	0	0
Volume Right	0	25	0	0	0	0	7
cSH	366	623	859	1700	1700	1700	1700
Volume to Capacity	0.01	0.04	0.12	0.13	0.13	0.30	0.15
Queue Length 95th (m)	0.1	1.0	3.1	0.0	0.0	0.0	0.0
Control Delay (s)	14.9	11.0	9.7	0.0	0.0	0.0	0.0
Lane LOS	B	B	A				
Approach Delay (s)	11.3		1.8			0.0	
Approach LOS	B						

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	40.0%	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	395	744	26
Future Volume (Veh/h)	9	6	25	395	744	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	395	744	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	0.98	0.98	0.98			
vC, conflicting volume	1004	385	770			
vC1, stage 1 conf vol	757					
vC2, stage 2 conf vol	248					
vCu, unblocked vol	955	321	715			
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)	417	665	873			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	15	25	198	198	496	274
Volume Left	9	25	0	0	0	0
Volume Right	6	0	0	0	0	26
cSH	490	873	1700	1700	1700	1700
Volume to Capacity	0.03	0.03	0.12	0.12	0.29	0.16
Queue Length 95th (m)	0.8	0.7	0.0	0.0	0.0	0.0
Control Delay (s)	12.6	9.2	0.0	0.0	0.0	0.0
Lane LOS	B	A				
Approach Delay (s)	12.6	0.6			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	31.4%	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)	186	572	356	235	557	215	84	314	52	177	176
v/c Ratio	0.45	0.50	0.54	0.54	0.48	0.34	0.19	0.31	0.13	0.18	0.38
Control Delay	18.3	31.1	14.4	19.5	29.3	10.9	21.5	28.0	21.1	30.2	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.3	31.1	14.4	19.5	29.3	10.9	21.5	28.0	21.1	30.2	7.5
Queue Length 50th (m)	21.9	53.6	21.4	28.4	51.0	10.3	11.2	25.8	6.8	15.6	0.0
Queue Length 95th (m)	35.6	75.8	54.2	44.3	70.2	29.7	23.0	40.5	15.7	26.4	17.6
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)	457	1362	750	510	1464	756	449	1013	387	987	461
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	0.42	0.47	0.46	0.38	0.28	0.19	0.31	0.13	0.18	0.38

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	186	572	356	235	557	215	84	251	63	52	177	176
Future Volume (vph)	186	572	356	235	557	215	84	251	63	52	177	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	1594	3269		1610	3374	1152
Flt Permitted	0.37	1.00	1.00	0.32	1.00	1.00	0.61	1.00		0.56	1.00	1.00
Satd. Flow (perm)	642	3406	1538	580	3343	1538	1031	3269		945	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	356	235	557	215	84	251	63	52	177	176
RTOR Reduction (vph)	0	0	151	0	0	96	0	17	0	0	0	125
Lane Group Flow (vph)	186	572	205	235	557	119	84	297	0	52	177	51
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)	47.0	35.2	35.2	50.6	37.0	37.0	38.9	32.2		36.3	30.9	30.9
Effective Green, g (s)	47.0	35.2	35.2	50.6	37.0	37.0	38.9	32.2		36.3	30.9	30.9
Actuated g/C Ratio	0.44	0.33	0.33	0.48	0.35	0.35	0.37	0.30		0.34	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)	394	1126	508	423	1162	534	412	989		356	979	334
v/s Ratio Prot	0.05	0.17		c0.07	0.17		c0.01	c0.09		0.01	0.05	
v/s Ratio Perm	0.16		0.13	c0.19		0.08	0.06			0.04		0.04
v/c Ratio	0.47	0.51	0.40	0.56	0.48	0.22	0.20	0.30		0.15	0.18	0.15
Uniform Delay, d1	18.9	28.6	27.5	17.6	27.2	24.5	22.6	28.5		23.9	28.3	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	0.5	1.6	0.3	0.2	0.2	0.8		0.2	0.4	1.0
Delay (s)	19.8	29.0	28.0	19.2	27.5	24.7	22.9	29.2		24.1	28.7	29.0
Level of Service	B	C	C	B	C	C	C	C		C	C	C
Approach Delay (s)		27.2			25.0			27.9			28.2	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	106.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	84.7%	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	40.8	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	40.8	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		3.01	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		46.6	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			15.7			40.5			44.9	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	21.6	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	350	7	49	193	147	10	105	97	105	252	77
v/c Ratio	0.01	0.23	0.01	0.12	0.13	0.19	0.02	0.06	0.12	0.18	0.15	0.10
Control Delay	19.7	21.9	0.0	21.3	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	21.9	0.0	21.3	20.7	3.9	17.5	17.8	3.9	19.6	18.7	4.2
Queue Length 50th (m)	0.8	28.2	0.0	7.1	14.8	0.0	1.3	7.3	0.0	14.8	18.4	0.0
Queue Length 95th (m)	3.5	39.0	0.2	15.5	22.5	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)	508	1533	701	422	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	0.23	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	350	7	49	193	147	10	105	97	105	252	77
Future Volume (vph)	6	350	7	49	193	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	0.52	1.00	1.00	0.60	1.00	1.00	0.69	1.00	1.00
Satd. Flow (perm)	1174	3539	1583	976	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	350	7	49	193	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	350	3	49	193	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)	508	1533	685	422	1533	685	518	1651	738	595	1651	738
v/s Ratio Prot		c0.10			0.05			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	0.23	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	21.4	19.3	20.3	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	0.3	0.0	0.6	0.2	0.3	0.1	0.1	0.2	0.6	0.2	0.1
Delay (s)	19.4	21.7	19.3	20.8	20.5	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)		21.6			20.5			17.7			18.6	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.20		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	41.3%	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)	26.0	77.7	76.0	63.3	69.0	3.4	65.6	75.4	77.1	78.7	92.2	7.1
Average Queue (m)	3.9	28.3	33.6	22.9	28.8	0.2	38.4	45.3	33.5	38.4	54.3	0.7
95th Queue (m)	16.3	61.7	64.5	50.1	58.1	3.3	59.4	66.1	62.2	70.0	87.1	4.4
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)		1	1	0	1						0	
Storage Bay Dist (m)	70.0						65.0	65.0				20.0
Storage Blk Time (%)		1					0	1	0			
Queuing Penalty (veh)		0					2	5	2			

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)	13.6	49.3	47.4	135.8	43.4
Average Queue (m)	2.5	21.8	43.1	45.4	3.7
95th Queue (m)	9.4	39.6	54.0	120.1	21.7
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 (%)	0		32	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)	117.4	118.4	116.4	88.2	62.6	128.7	103.3	62.3	77.5	294.3	335.6	328.2
Average Queue (m)	63.8	72.9	60.1	51.4	21.9	63.4	37.3	27.9	39.7	248.1	269.7	170.4
95th Queue (m)	121.5	124.5	111.3	92.9	63.1	108.2	74.4	49.7	65.0	352.7	386.6	377.0
Link Distance (m)	114.0	114.0	114.0	114.0			168.4	168.4	168.4		326.9	326.9
Upstream Blk Time (%)	2	3	1	1			0				21	7
Queuing Penalty (veh)	7	10	3	3			0				0	0
Storage Bay Dist (m)					45.0	135.0				300.0		
Storage Blk Time (%)				14	0	0				5	28	6
Queuing Penalty (veh)				34	1	2				19	101	22

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

Movement	SB	B36	B36
Directions Served	R	T	T
Maximum Queue (m)	294.8	105.3	100.5
Average Queue (m)	126.8	29.7	27.8
95th Queue (m)	302.3	124.8	122.2
Link Distance (m)		176.9	176.9
Upstream Blk Time (%)		4	4
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)	55.8	59.7	90.0	67.0	75.1	159.5	107.7	57.6	101.3	63.0	58.0	59.7
Average Queue (m)	25.7	27.1	13.4	9.2	11.9	64.2	25.4	25.2	56.1	32.9	28.3	28.0
95th Queue (m)	47.0	51.2	52.8	37.5	45.7	123.8	73.3	45.0	89.3	54.2	50.2	49.5
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)						1	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)	44.6
Average Queue (m)	14.1
95th Queue (m)	33.7
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)	56.3	56.8	56.9	49.5	72.1	15.5	36.6	137.8	139.6	145.2	168.6	43.6
Average Queue (m)	29.2	35.1	27.5	24.7	39.7	1.9	1.6	85.9	96.8	118.4	70.7	16.0
95th Queue (m)	46.0	49.8	48.5	40.6	62.2	8.3	15.1	143.4	151.9	163.6	191.8	32.2
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)								1	1	11	5	
Queuing Penalty (veh)								5	5	55	25	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)								24				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)	56.0	16.9	18.3	13.3	50.0
Average Queue (m)	28.5	5.0	4.9	1.8	22.0
95th Queue (m)	47.5	13.8	13.0	7.4	39.3
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)	70.0	70.6	29.5	34.4	38.2	56.1	99.9	241.4	251.5	258.6	64.5	80.2
Average Queue (m)	40.0	41.9	10.8	15.6	17.3	25.3	17.9	161.0	209.6	224.2	24.2	39.3
95th Queue (m)	59.7	62.0	23.9	28.4	31.6	46.2	68.9	292.0	320.2	312.4	52.2	70.0
Link Distance (m)			131.2	131.2	131.2			244.4	244.4	244.4		
Upstream Blk Time (%)								4	27	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	0				1		5				0
Queuing Penalty (veh)	1	1				1		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)	24.9	21.8	96.0	42.1	120.3	80.0
Average Queue (m)	5.5	6.4	49.1	17.6	35.1	51.3
95th Queue (m)	16.6	14.4	85.8	33.4	91.6	91.3
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 (%)			0		0	17
Queuing Penalty (veh)			0		1	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)	21.8	19.0	20.6	9.1	29.3	45.5	46.7	6.6	68.3	99.8
Average Queue (m)	8.0	6.0	4.9	0.7	9.6	9.8	11.8	0.4	18.1	35.1
95th Queue (m)	18.0	14.7	16.2	4.7	23.3	30.6	34.0	3.4	47.4	78.4
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 (%)									0	
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)	24.7	28.2	8.7	18.0	31.7	29.8	6.3	52.8	69.0
Average Queue (m)	8.2	8.4	1.2	5.9	6.0	6.2	0.6	14.6	25.1
95th Queue (m)	18.7	22.3	5.9	14.1	21.6	21.6	3.9	39.1	55.2
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 (%)	1							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)	18.9	11.6	20.9	41.0	26.6	37.5	35.2	21.4	49.6	65.6
Average Queue (m)	6.2	4.8	4.0	20.3	7.7	9.8	9.1	7.2	21.3	30.1
95th Queue (m)	15.2	12.0	13.5	33.9	22.0	27.0	25.8	17.2	43.4	57.5
Link Distance (m)				212.1		247.7	247.7		206.7	206.7
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 & Coca-Cola D/W

Movement	WB	NB	SB
Directions Served	LR	T	L
Maximum Queue (m)	25.0	1.9	10.3
Average Queue (m)	4.9	0.1	1.5
95th Queue (m)	15.9	1.3	7.0
Link Distance (m)	182.2	206.7	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			15.0
Storage Blk Time (%)			0
Queuing Penalty (veh)			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)	7.3	13.2	19.3	14.3	1.2
Average Queue (m)	0.8	5.4	9.5	0.7	0.0
95th Queue (m)	4.8	12.9	18.3	8.4	0.8
Link Distance (m)	102.1	102.1		208.0	137.8
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)			15.0		
Storage Blk Time (%)			2		
Queuing Penalty (veh)			4		

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

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (m)	10.4	14.0
Average Queue (m)	3.4	3.4
95th Queue (m)	10.5	11.1
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)	69.9	87.6	145.1	74.3	66.9	72.0	69.0	47.0	32.1	65.1	59.0	26.6
Average Queue (m)	29.6	46.9	47.0	29.1	33.4	45.5	41.5	16.8	14.6	33.1	16.0	9.5
95th Queue (m)	54.8	75.5	102.7	57.9	58.0	69.4	67.1	34.0	29.2	56.0	41.1	21.3
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	26	26	8	7	13	21	1				
Queuing Penalty (veh)	31	48	93	23	19	30	45	3				

Intersection: 33: Bayview Drive & Big Bay Point Road

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (m)	44.0	34.4	53.3
Average Queue (m)	21.1	11.6	21.2
95th Queue (m)	39.2	29.0	40.3
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)	0		0

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)	34.5	71.2	87.0	98.0	32.3	89.5	65.9	47.0	39.1	7.4	41.1	16.1
Average Queue (m)	9.0	36.2	46.5	48.9	30.5	51.8	25.1	19.6	3.8	0.7	16.1	4.5
95th Queue (m)	21.7	63.0	76.1	86.6	37.3	99.2	55.9	35.5	23.6	8.3	31.8	12.9
Link Distance (m)		286.7	286.7	286.7		66.0	66.0	66.0	86.5	86.5		103.6
Upstream Blk Time (%)						12	0	0				
Queuing Penalty (veh)						54	1	0				
Storage Bay Dist (m)	60.0				25.0						45.0	
Storage Blk Time (%)		1			42	1					0	
Queuing Penalty (veh)		1			129	2					0	

Intersection: 39: Bryne Drive & Mapleview Drive W

Movement	NB	SB	SB	SB
Directions Served	TR	L	T	TR
Maximum Queue (m)	27.5	19.8	47.3	35.9
Average Queue (m)	9.7	4.9	19.5	10.8
95th Queue (m)	21.2	15.2	38.6	23.3
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)	11.4	50.8	46.1	7.3	28.2	33.6	35.2	36.9	9.0	31.4	9.5	13.4
Average Queue (m)	1.1	27.0	19.4	0.7	10.3	11.5	14.7	12.3	2.2	12.7	1.8	5.5
95th Queue (m)	6.2	45.3	39.7	4.7	23.9	26.9	31.4	26.5	7.7	24.7	6.7	11.5
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					0				
Queuing Penalty (veh)			0					0				

Intersection: 43: Big Bay Point Road

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (m)	29.3	48.5	34.8	16.0
Average Queue (m)	15.4	25.9	10.9	5.2
95th Queue (m)	28.3	43.9	25.4	12.6
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: 813

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	334	1683	1588	762	295	304
v/c Ratio	0.69	0.45	0.59	0.52	0.58	0.67
Control Delay	41.0	4.2	5.8	3.8	47.7	40.8
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	41.0	4.5	5.8	3.8	47.7	40.8
Queue Length 50th (m)	23.4	2.4	17.7	4.6	32.8	29.2
Queue Length 95th (m)	32.3	0.0	22.7	67.5	44.1	42.9
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	527	3701	2682	1468	825	703
Starvation Cap Reductn	0	1091	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	0.59	0.52	0.36	0.43

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	334	1683	0	0	1588	762	295	0	304	0	0	0
Future Volume (vph)	334	1683	0	0	1588	762	295	0	304	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	1588	762	295	0	304	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	1588	762	295	0	246	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	80.9			60.3	110.0	17.1		17.1			
Effective Green, g (s)	16.6	80.9			60.3	110.0	17.1		17.1			
Actuated g/C Ratio	0.15	0.74			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	3703			2682	1468	503		398			
v/s Ratio Prot	c0.10	0.33			c0.32		0.09					
v/s Ratio Perm						c0.52			0.10			
v/c Ratio	0.69	0.45			0.59	0.52	0.59		0.62			
Uniform Delay, d1	44.3	5.8			16.6	0.0	43.2		43.4			
Progression Factor	0.81	0.65			0.29	1.00	1.00		1.00			
Incremental Delay, d2	3.0	0.3			0.7	0.9	1.7		2.8			
Delay (s)	38.7	4.0			5.5	0.9	44.9		46.2			
Level of Service	D	A			A	A	D		D			
Approach Delay (s)		9.8			4.0			45.6			0.0	
Approach LOS		A			A			D			A	

Intersection Summary

HCM 2000 Control Delay	11.4	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	79.9%	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)	293	1552	29	3	1963	76	223	30	21	10	165
v/c Ratio	0.51	0.47	0.03	0.01	0.82	0.10	0.56	0.14	0.17	0.08	0.32
Control Delay	62.0	3.7	0.0	5.3	14.4	0.2	51.3	25.6	51.5	49.0	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.0	3.7	0.0	5.3	14.6	0.2	51.3	25.6	51.5	49.0	6.3
Queue Length 50th (m)	34.2	8.8	0.0	0.1	48.5	0.0	25.0	2.5	4.6	2.2	0.0
Queue Length 95th (m)	50.5	38.2	m0.0	m0.2	#195.8	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	272	2397	794	1103	558	121	128	516
Starvation Cap Reductn	0	0	0	0	72	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	0.01	0.84	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	1552	29	3	1963	76	223	12	18	21	10	165
Future Volume (vph)	293	1552	29	3	1963	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	291	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	1552	29	3	1963	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	1552	18	3	1963	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	160	2296	698	397	196		75	79	338
v/s Ratio Prot	c0.09	0.32		0.00	c0.40		c0.06	0.01		c0.01	0.01	0.02
v/s Ratio Perm			0.01	0.01		0.02						0.00
v/c Ratio	0.51	0.50	0.02	0.02	0.85	0.05	0.56	0.07		0.28	0.13	0.10
Uniform Delay, d1	41.5	11.0	7.6	14.5	25.6	15.6	46.1	43.5		51.1	50.8	34.9
Progression Factor	1.40	0.32	1.00	0.64	0.45	0.09	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	0.5	0.0	0.0	2.3	0.1	1.8	0.2		2.0	0.7	0.1
Delay (s)	59.0	4.0	7.6	9.4	14.0	1.5	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)		12.6			13.5			47.4			37.8	
Approach LOS		B			B			D			D	

Intersection Summary

HCM 2000 Control Delay	16.2	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	73.2%	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)	57.9	62.0	86.6	80.6	79.9	193.7	139.0	61.7	45.6	71.4	59.4	58.4
Average Queue (m)	26.6	25.6	15.5	13.2	16.8	84.3	34.7	27.2	7.6	30.7	26.9	31.1
95th Queue (m)	47.8	47.4	58.6	51.7	58.3	168.2	102.6	48.8	28.9	56.2	48.4	54.0
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)						1	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)	48.5
Average Queue (m)	15.9
95th Queue (m)	38.5
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)	48.9	57.0	45.1	40.1	70.2	9.5	17.3	136.7	137.2	144.1	163.8	46.8
Average Queue (m)	29.3	35.3	23.1	21.0	35.5	1.7	1.3	72.7	75.4	102.0	41.9	16.3
95th Queue (m)	46.6	50.8	39.5	35.5	56.7	7.1	9.6	133.3	142.8	160.6	144.4	32.9
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)								5	3	25	12	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)								17				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)	61.6	15.8	20.9	10.6	48.0
Average Queue (m)	28.5	5.4	5.6	2.0	22.0
95th Queue (m)	49.2	12.8	15.5	8.0	40.2
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 (%)	1				
Queuing Penalty (veh)	1				

Zone Summary

Zone wide Queuing Penalty: 48

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	70.0	15.5	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	70.0	15.7	23.1	37.7	44.3	37.3	21.1
Queue Length 50th (m)	2.8	86.8	43.5	27.6	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	577	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.

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		1.09	0.52		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		66.9	16.3		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			26.4			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	451	1733	788	368
v/c Ratio	0.79	0.41	0.94	0.52	0.90	0.49
Control Delay	30.0	8.8	45.9	10.1	61.0	36.2
Queue Delay	0.4	0.3	0.0	0.4	0.8	0.0
Total Delay	30.4	9.1	45.9	10.6	61.8	36.2
Queue Length 50th (m)	148.7	10.2	99.3	117.0	104.9	39.6
Queue Length 95th (m)	144.5	m19.4	#163.5	139.2	#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)	2390	665	522	3329	906	778
Starvation Cap Reductn	136	93	0	965	0	0
Spillback Cap Reductn	0	0	0	11	21	0
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	451	1733	0	0	0	0	788	0	368
Future Volume (vph)	0	1891	271	451	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	139	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	451	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	451	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)		48.5	48.5	84.3	84.3					33.7		33.7
Effective Green, g (s)		48.5	48.5	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)		2390	579	480	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		0.79	0.32	0.94	0.52					0.90		0.46
Uniform Delay, d1		36.2	29.0	39.3	12.1					46.6		40.5
Progression Factor		0.74	0.47	0.65	0.78					1.00		1.00
Incremental Delay, d2		2.1	1.1	20.4	0.4					12.6		0.5
Delay (s)		29.1	14.8	45.7	9.9					59.2		40.9
Level of Service		C	B	D	A					E		D
Approach Delay (s)		27.3			17.3			0.0			53.4	
Approach LOS		C			B			A			D	

Intersection Summary

HCM 2000 Control Delay	28.8	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	1655	1124	529	512
v/c Ratio	0.97	0.54	0.71	1.09	0.77	0.87
Control Delay	57.2	12.5	23.9	62.9	57.5	60.0
Queue Delay	0.0	1.3	0.0	3.9	0.0	0.0
Total Delay	57.2	13.8	23.9	66.7	57.5	60.0
Queue Length 50th (m)	~113.5	145.2	74.5	~116.2	68.7	67.0
Queue Length 95th (m)	m#145.3	156.4	m74.7	m#126.0	89.0	#91.2
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	755	3567	2327	1030	739	634
Starvation Cap Reductn	0	1319	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	0.97	0.86	0.71	1.16	0.72	0.81

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	1655	1124	529	0	512	0	0	0
Future Volume (vph)	735	1944	0	0	1655	1124	529	0	512	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	1655	1124	529	0	512	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	1655	818	529	0	465	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)	28.6	92.1			59.5	59.5	25.9		25.9			
Effective Green, g (s)	28.6	92.1			59.5	59.5	25.9		25.9			
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)	755	3567			2327	724	683		544			
v/s Ratio Prot	c0.21	0.39			0.33		0.15					
v/s Ratio Perm						c0.52			c0.17			
v/c Ratio	0.97	0.54			0.71	1.13	0.77		0.85			
Uniform Delay, d1	50.3	9.0			28.3	35.2	49.3		50.2			
Progression Factor	0.73	1.30			0.82	0.94	1.00		1.00			
Incremental Delay, d2	18.2	0.3			0.4	63.1	5.5		12.4			
Delay (s)	54.8	12.0			23.7	96.3	54.8		62.6			
Level of Service	D	B			C	F	D		E			
Approach Delay (s)		23.8			53.1			58.6			0.0	
Approach LOS		C			D			E			A	

Intersection Summary

HCM 2000 Control Delay	41.9	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	1787	64	60	1497	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	130.6	51.9	0.5	26.3	61.4	7.6	62.2	33.4	60.2	47.4	117.3
Queue Delay	0.0	0.0	0.0	0.0	3.6	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	130.6	51.9	0.5	26.3	65.0	7.6	62.2	33.4	60.2	47.4	117.3
Queue Length 50th (m)	~58.4	~197.7	0.2	6.4	~157.8	4.1	110.6	14.6	52.4	11.7	~111.9
Queue Length 95th (m)	m#90.4	#229.9	m0.6	m10.3	#182.3	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	1787	64	60	1497	236	827	65	15	205	50	456
Future Volume (vph)	383	1787	64	60	1497	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	1787	64	60	1497	236	827	65	15	205	50	456
RTOR Reduction (vph)	0	0	42	0	0	131	0	7	0	0	0	118
Lane Group Flow (vph)	383	1787	22	60	1497	105	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	1.04	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	0.57	0.24	0.98	0.81	0.65	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	71.1	31.9	0.1	1.5	24.0	0.9	13.5	0.2		4.3	0.2	112.3
Delay (s)	137.6	55.9	6.8	35.1	61.3	23.8	60.2	37.2		53.9	45.3	165.8
Level of Service	F	E	A	D	E	C	E	D		D	D	F
Approach Delay (s)		68.5			55.5			58.1			125.0	
Approach LOS		E			E			E			F	

Intersection Summary

HCM 2000 Control Delay	69.8	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	95.8%	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)	457	1332	218	73	1212	272	236	284	176	491
v/c Ratio	0.83	0.52	0.29	0.32	0.65	0.76	0.40	0.71	0.25	0.91
Control Delay	72.5	18.6	6.6	19.3	36.5	70.8	40.5	42.6	43.2	40.5
Queue Delay	0.0	0.1	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.5
Total Delay	72.5	18.7	6.6	19.3	37.0	70.8	40.5	42.6	43.2	41.0
Queue Length 50th (m)	64.1	54.2	10.9	8.2	99.0	37.1	24.8	59.1	21.2	55.5
Queue Length 95th (m)	m66.0	m54.6	m11.4	17.8	128.1	#52.9	35.2	78.1	29.7	99.0
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)	590	2561	764	232	1853	373	804	402	934	620
Starvation Cap Reductn	0	319	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	262	0	0	0	0	15
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.59	0.29	0.31	0.76	0.73	0.29	0.71	0.19	0.81

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)	457	1332	218	73	1029	183	272	171	65	284	176	491
Future Volume (vph)	457	1332	218	73	1029	183	272	171	65	284	176	491
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		819	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)	457	1332	218	73	1029	183	272	171	65	284	176	491
RTOR Reduction (vph)	0	0	77	0	17	0	0	33	0	0	0	241
Lane Group Flow (vph)	457	1332	141	73	1195	0	272	203	0	284	176	250
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	64.7	64.7	55.3	49.1		13.5	21.5		43.1	25.6	25.6
Effective Green, g (s)	21.8	64.7	64.7	55.3	49.1		13.5	21.5		43.1	25.6	25.6
Actuated g/C Ratio	0.17	0.50	0.50	0.43	0.38		0.10	0.17		0.33	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	2530	680	205	1835		360	550		388	703	300
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	0.13						0.14		c0.16
v/c Ratio	0.83	0.53	0.21	0.36	0.65		0.76	0.37		0.73	0.25	0.83
Uniform Delay, d1	52.3	22.2	18.3	22.5	33.4		56.6	48.2		35.1	44.1	50.2
Progression Factor	1.32	0.77	0.84	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.9	0.2	0.2	1.1	1.8		8.7	0.4		7.0	0.2	17.7
Delay (s)	71.6	17.4	15.5	23.5	35.2		65.4	48.6		42.1	44.3	67.9
Level of Service	E	B	B	C	D		E	D		D	D	E
Approach Delay (s)		29.5			34.5			57.6			55.8	
Approach LOS		C			C			E			E	

Intersection Summary

HCM 2000 Control Delay	39.1	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	78.3%	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	717	11	945
v/c Ratio	0.59	0.14	0.05	0.24	0.30	0.02	0.44
Control Delay	28.7	34.5	16.5	6.4	7.8	5.5	11.6
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	11.6
Queue Length 50th (m)	13.2	4.1	0.2	3.4	18.0	0.4	41.8
Queue Length 95th (m)	28.7	11.1	5.7	12.9	60.1	2.7	83.6
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	398	2380	584	2125
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	0.30	0.02	0.44

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	693	24	11	809	136
Future Volume (vph)	137	1	117	24	1	14	95	693	24	11	809	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	0.99		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	3374	
Flt Permitted		0.81		0.39	1.00		0.24	1.00		0.38	1.00	
Satd. Flow (perm)		2694		596	1634		425	3425		720	3374	
Peak-hour factor, PHF	1.00	1.00	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	693	24	11	809	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	716	0	11	936	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		364	2249		464	2079	
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	0.45	
Uniform Delay, d1		43.1		35.9	35.2		5.8	7.7		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	8.1		7.3	11.3	
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	763	1013
v/c Ratio	0.55	0.00	0.37	0.01	0.00	0.19	0.30	0.45
Control Delay	45.4	40.0	11.6	35.0	0.0	4.7	5.0	10.4
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	10.4
Queue Length 50th (m)	26.0	0.2	0.0	0.2	0.0	2.7	18.2	44.1
Queue Length 95th (m)	45.3	1.8	11.5	1.6	0.0	10.6	45.5	90.4
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	567	449	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	0.18	0.30	0.45

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	762	1	0	870	143
Future Volume (vph)	143	1	85	1	0	1	82	762	1	0	870	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			3463	
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		416	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)	143	1	85	1	0	1	82	762	1	0	870	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	763	0	0	1004	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		374	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	0.31			0.48	
Uniform Delay, d1	37.1	38.5	38.8	47.3	48.5		5.8	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		6.1	5.9			11.7	
Level of Service	D	D	D	D	D		A	A			B	
Approach Delay (s)		38.7			48.0			6.0			11.7	
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	818	70	1007
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	9.3	19.2	9.7	20.8
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	9.3	19.2	9.7	20.8
Queue Length 50th (m)	17.2	4.8	0.0	9.8	1.9	5.2	64.4	6.1	84.7
Queue Length 95th (m)	31.2	12.6	2.9	20.2	12.1	10.4	81.0	11.9	104.8
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)	388	332	361	360	301	339	1790	333	1807
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	767	51	70	902	105
Future Volume (vph)	93	23	58	54	9	31	61	767	51	70	902	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	3456		1455	3486	
Flt Permitted	0.70	1.00	1.00	0.74	1.00		0.20	1.00		0.28	1.00	
Satd. Flow (perm)	1323	1900	1593	1342	1653		382	3456		422	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	767	51	70	902	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	814	0	70	1000	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		332	1785		327	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			0.09			0.11		
v/c Ratio	0.25	0.07	0.04	0.16	0.05		0.18	0.46		0.21	0.56	
Uniform Delay, d1	35.6	41.3	41.1	36.4	42.0		11.9	18.3		11.2	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	0.8		1.5	1.2	
Delay (s)	37.3	41.7	41.3	37.4	42.4		13.1	19.2		12.7	20.9	
Level of Service	D	D	D	D	D		B	B		B	C	
Approach Delay (s)		39.2			39.5			18.8			20.4	
Approach LOS		D			D			B			C	

Intersection Summary				
HCM 2000 Control Delay	22.0	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	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	69	25	892	16	7	872
Future Volume (Veh/h)	69	25	892	16	7	872
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)	69	25	892	16	7	872
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	
vC, conflicting volume	1353	458			911	
vC1, stage 1 conf vol	903					
vC2, stage 2 conf vol	450					
vCu, unblocked vol	1089	51			576	
tC, single (s)	6.9	6.9			4.1	
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3			2.2	
p0 queue free %	82	97			99	
cM capacity (veh/h)	386	870			866	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	94	595	313	7	436	436
Volume Left	69	0	0	7	0	0
Volume Right	25	0	16	0	0	0
cSH	453	1700	1700	866	1700	1700
Volume to Capacity	0.21	0.35	0.18	0.01	0.26	0.26
Queue Length 95th (m)	6.2	0.0	0.0	0.2	0.0	0.0
Control Delay (s)	15.0	0.0	0.0	9.2	0.0	0.0
Lane LOS	C			A		
Approach Delay (s)	15.0	0.0		0.1		
Approach LOS	C					

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	37.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	107	39	875	772	4
Future Volume (Veh/h)	9	107	39	875	772	4
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	107	39	875	772	4
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	1290	389	777			
vC1, stage 1 conf vol	775					
vC2, stage 2 conf vol	516					
vCu, unblocked vol	1208	263	670			
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	85	96			
cM capacity (veh/h)	373	707	886			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	9	107	39	438	438	515	261
Volume Left	9	0	39	0	0	0	0
Volume Right	0	107	0	0	0	0	4
cSH	373	707	886	1700	1700	1700	1700
Volume to Capacity	0.02	0.15	0.04	0.26	0.26	0.30	0.15
Queue Length 95th (m)	0.6	4.2	1.1	0.0	0.0	0.0	0.0
Control Delay (s)	14.9	11.0	9.2	0.0	0.0	0.0	0.0
Lane LOS	B	B	A				
Approach Delay (s)	11.3		0.4			0.0	
Approach LOS	B						

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	38.1%	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	846	719	16
Future Volume (Veh/h)	35	27	10	846	719	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	846	719	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	1172	370	737			
vC1, stage 1 conf vol	729					
vC2, stage 2 conf vol	443					
vCu, unblocked vol	1043	183	577			
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	97	99			
cM capacity (veh/h)	423	778	939			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	62	10	423	423	479	256
Volume Left	35	10	0	0	0	0
Volume Right	27	0	0	0	0	16
cSH	528	939	1700	1700	1700	1700
Volume to Capacity	0.12	0.01	0.25	0.25	0.28	0.15
Queue Length 95th (m)	3.2	0.3	0.0	0.0	0.0	0.0
Control Delay (s)	12.7	8.9	0.0	0.0	0.0	0.0
Lane LOS	B	A				
Approach Delay (s)	12.7	0.1			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	33.6%	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	194	227	483	140	324	556	92	307	327
v/c Ratio	0.57	0.68	0.35	0.68	0.45	0.24	0.63	0.49	0.26	0.35	0.56
Control Delay	26.3	39.5	12.6	29.3	35.0	6.9	27.8	30.6	21.9	38.9	8.2
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	26.3	39.5	12.6	29.3	35.0	6.9	27.8	30.6	21.9	38.9	8.2
Queue Length 50th (m)	25.3	81.0	10.2	32.1	50.4	0.7	52.1	52.1	12.7	33.4	0.0
Queue Length 95th (m)	42.2	105.7	30.3	49.9	68.3	16.0	77.9	71.4	23.5	48.3	25.9
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)	338	1077	551	370	1077	572	537	1146	368	865	588
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	0.52	0.67	0.35	0.61	0.45	0.24	0.60	0.49	0.25	0.35	0.56

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	177	723	194	227	483	140	324	405	151	92	307	327
Future Volume (vph)	177	723	194	227	483	140	324	405	151	92	307	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	3404		1770	3539	1396
Flt Permitted	0.37	1.00	1.00	0.22	1.00	1.00	0.45	1.00		0.44	1.00	1.00
Satd. Flow (perm)	487	3471	1476	404	3574	1583	820	3404		827	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	194	227	483	140	324	405	151	92	307	327
RTOR Reduction (vph)	0	0	94	0	0	95	0	32	0	0	0	247
Lane Group Flow (vph)	177	723	100	227	483	45	324	524	0	92	307	80
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	35.8	35.8	48.8	35.1	35.1	50.9	38.2		37.2	28.5	28.5
Effective Green, g (s)	50.2	35.8	35.8	48.8	35.1	35.1	50.9	38.2		37.2	28.5	28.5
Actuated g/C Ratio	0.43	0.31	0.31	0.42	0.30	0.30	0.44	0.33		0.32	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)	304	1067	453	330	1077	477	503	1117		334	866	341
v/s Ratio Prot	0.07	c0.21		c0.08	0.14		c0.10	0.15		0.02	0.09	
v/s Ratio Perm	0.18		0.07	0.21		0.03	c0.18			0.07		0.06
v/c Ratio	0.58	0.68	0.22	0.69	0.45	0.09	0.64	0.47		0.28	0.35	0.23
Uniform Delay, d1	22.3	35.3	29.9	23.9	32.8	29.2	22.9	31.1		28.4	36.3	35.2
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	2.8	1.7	0.2	5.9	0.3	0.1	2.8	1.4		0.5	1.1	1.6
Delay (s)	25.1	37.0	30.2	29.8	33.1	29.3	25.8	32.5		28.9	37.5	36.8
Level of Service	C	D	C	C	C	C	C	C		C	D	D
Approach Delay (s)		33.9			31.6			30.0			36.1	
Approach LOS		C			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	32.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	116.4	Sum of lost time (s)	20.0
Intersection Capacity Utilization	96.4%	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)	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	53.4	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	53.4	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	242	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	511	3	69	478	35	45	346	74	297	324	87
v/c Ratio	0.02	0.50	0.01	0.37	0.46	0.07	0.07	0.16	0.07	0.48	0.15	0.09
Control Delay	30.8	37.2	0.0	40.7	36.6	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	30.8	37.2	0.0	40.7	36.6	10.3	10.1	10.4	2.3	16.3	10.3	2.2
Queue Length 50th (m)	0.7	55.2	0.0	13.6	51.0	0.0	4.3	18.4	0.0	38.3	17.1	0.0
Queue Length 95th (m)	3.6	72.7	0.0	28.6	67.8	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)	202	1032	480	187	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	0.37	0.46	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	511	3	69	478	35	45	346	74	297	324	87
Future Volume (vph)	4	511	3	69	478	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	0.37	1.00	1.00	0.35	1.00	1.00	0.56	1.00	1.00	0.54	1.00	1.00
Satd. Flow (perm)	693	3539	1583	643	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	511	3	69	478	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	511	1	69	478	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)	202	1032	461	187	1032	461	629	2152	962	616	2152	962
v/s Ratio Prot		c0.14			0.14			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	0.37	0.46	0.02	0.07	0.16	0.05	0.48	0.15	0.06
Uniform Delay, d1	30.3	35.2	30.1	33.7	34.8	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	1.7	0.0	5.5	1.5	0.1	0.2	0.2	0.1	2.7	0.1	0.1
Delay (s)	30.5	36.9	30.1	39.3	36.3	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)		36.8			36.3			10.2			12.5	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	23.6	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	64.3%	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	WB	WB	WB	WB	WB
Directions Served	L	T	T	T	TR	T	T	L	L	T	T	TR
Maximum Queue (m)	63.4	101.9	105.8	86.8	87.0	12.2	4.0	62.4	76.7	101.9	101.0	115.5
Average Queue (m)	7.8	61.7	61.4	50.8	47.9	0.5	0.1	33.5	41.3	28.6	44.0	60.4
95th Queue (m)	30.6	91.5	92.7	82.2	74.9	4.9	2.5	56.9	64.7	65.0	84.5	101.2
Link Distance (m)		86.8	86.8	86.8	86.8	65.4	65.4			114.0	114.0	114.0
Upstream Blk Time (%)		1	1	0	0					0		0
Queuing Penalty (veh)		4	2	0	1					0		1
Storage Bay Dist (m)	70.0							65.0	65.0			
Storage Blk Time (%)		4						1	2	0		
Queuing Penalty (veh)		1						3	8	1		

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)	23.7	27.9	90.7	47.4	174.4	104.4
Average Queue (m)	7.3	9.7	87.8	45.7	76.5	15.8
95th Queue (m)	18.6	22.4	104.6	52.9	160.1	58.5
Link Distance (m)		86.1	86.1		180.4	180.4
Upstream Blk Time (%)			83		1	
Queuing Penalty (veh)			0		0	
Storage Bay Dist (m)	20.0			40.0		
Storage Blk Time (%)	2	4		47	0	
Queuing Penalty (veh)	1	1		9	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)	111.1	110.4	104.0	85.9	37.8	106.9	48.6	46.6	58.3	307.5	357.0	354.7
Average Queue (m)	60.8	56.4	42.7	41.7	10.4	52.6	28.2	28.6	40.1	304.6	344.9	315.1
95th Queue (m)	100.4	93.3	72.5	67.5	25.4	89.9	43.9	43.6	54.1	325.5	378.0	430.0
Link Distance (m)	114.0	114.0	114.0	114.0			168.4	168.4	168.4		326.9	326.9
Upstream Blk Time (%)	0	0	0								78	42
Queuing Penalty (veh)	2	1	0								0	0
Storage Bay Dist (m)					45.0	135.0				300.0		
Storage Blk Time (%)				5						16	82	50
Queuing Penalty (veh)				13						61	323	92

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

Movement	SB	B36	B36
Directions Served	R	T	T
Maximum Queue (m)	307.5	194.3	193.6
Average Queue (m)	222.8	150.8	147.6
95th Queue (m)	422.8	255.1	257.9
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)	131.7	136.8	110.0	88.1	98.5	100.2	106.8	214.8	189.6	86.5	87.6	84.9
Average Queue (m)	71.5	75.1	49.8	40.0	48.7	62.8	41.5	65.4	131.4	55.4	55.6	51.8
95th Queue (m)	118.6	124.3	97.6	80.7	90.7	90.9	74.5	150.5	189.0	81.6	80.0	77.9
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)		1					0	0				
Storage Bay Dist (m)	130.0								130.0	265.0		
Storage Blk Time (%)	1	1							20			
Queuing Penalty (veh)	3	4							108			

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

Movement	NB
Directions Served	R
Maximum Queue (m)	75.6
Average Queue (m)	38.3
95th Queue (m)	70.2
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)	78.5	82.8	147.2	159.1	169.1	11.6	57.3	121.5	128.5	144.6	166.6	57.4
Average Queue (m)	47.6	52.6	69.4	69.7	82.4	4.0	14.0	66.4	110.9	134.0	144.2	55.9
95th Queue (m)	72.9	77.4	120.6	124.0	137.5	11.0	41.2	110.4	141.6	147.8	210.9	64.9
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)								0	0	18	29	
Queuing Penalty (veh)								0	1	82	130	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)			0		0		0	16				9
Queuing Penalty (veh)			1		0		0	10				36

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	135.0	66.3	100.6	100.6
Average Queue (m)	133.7	84.3	43.2	54.9	100.6
95th Queue (m)	136.7	180.7	69.9	126.9	100.6
Link Distance (m)	128.7	128.7		96.0	96.0
Upstream Blk Time (%)	74	17		9	90
Queuing Penalty (veh)	0	0		0	0
Storage Bay Dist (m)			60.0		
Storage Blk Time (%)	65		9		
Queuing Penalty (veh)	270		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)	80.4	80.1	60.3	54.0	51.2	38.6	31.7	248.9	258.5	262.7	71.9	81.2
Average Queue (m)	49.4	53.0	25.5	29.6	30.9	18.9	8.2	106.0	238.0	251.1	28.9	47.4
95th Queue (m)	71.4	75.4	50.3	50.2	49.4	34.1	21.8	261.7	309.5	257.4	59.9	73.5
Link Distance (m)			131.2	131.2	131.2			244.4	244.4	244.4		
Upstream Blk Time (%)								2	53	97		
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			1	0		1				0
Queuing Penalty (veh)	9	20			2	0		1				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)	49.3	48.5	104.8	193.6	215.6	80.0
Average Queue (m)	24.4	19.4	65.7	48.6	102.5	69.1
95th Queue (m)	43.5	37.4	110.8	142.4	219.9	102.5
Link Distance (m)	218.2	218.2		214.5	214.5	
Upstream Blk Time (%)				0	1	
Queuing Penalty (veh)				0	3	
Storage Bay Dist (m)			110.0			45.0
Storage Blk Time (%)			4	0	1	50
Queuing Penalty (veh)			3	0	3	44

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)	51.5	27.3	24.1	10.9	36.4	58.6	62.8	20.0	87.1	129.7
Average Queue (m)	24.9	13.5	6.2	3.3	13.4	21.4	23.5	1.8	29.6	55.0
95th Queue (m)	43.0	23.2	18.8	10.6	27.4	54.9	55.5	11.2	65.4	109.8
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			2	
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)	42.5	55.4	31.3	2.0	6.2	23.8	44.9	48.0	86.8	107.8
Average Queue (m)	24.9	2.8	16.0	0.1	0.3	8.8	12.3	12.6	27.3	47.3
95th Queue (m)	40.1	22.9	28.2	1.4	3.0	18.3	31.1	33.7	67.9	96.2
Link Distance (m)		71.5	71.5	75.9	75.9		195.2	195.2	247.7	247.7
Upstream Blk Time (%)		0								
Queuing Penalty (veh)		0								
Storage Bay Dist (m)	25.0					70.0				
Storage Blk Time (%)	13	0							1	
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)	40.3	25.0	19.6	32.4	26.4	53.2	85.3	88.9	63.2	110.1	119.4
Average Queue (m)	16.2	5.3	8.4	10.8	6.6	10.5	44.8	45.5	16.7	65.8	82.4
95th Queue (m)	32.9	15.7	17.1	24.8	18.0	32.6	77.1	78.9	47.0	98.4	109.7
Link Distance (m)		140.4			212.1		247.7	247.7		206.7	206.7
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		1		0	4	
Queuing Penalty (veh)	0			0	0		1		0	3	

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

Movement	WB	NB	SB	SB	SB
Directions Served	LR	T	L	T	T
Maximum Queue (m)	42.0	2.3	9.1	7.8	16.1
Average Queue (m)	14.9	0.1	1.0	0.3	0.6
95th Queue (m)	29.6	1.5	5.5	3.9	6.2
Link Distance (m)	182.2	206.7		208.0	208.0
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)			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
Directions Served	L	R	L
Maximum Queue (m)	10.8	23.1	14.0
Average Queue (m)	2.3	11.1	4.5
95th Queue (m)	8.9	17.8	12.9
Link Distance (m)	102.1	102.1	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			15.0
Storage Blk Time (%)			0
Queuing Penalty (veh)			1

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

Movement	EB	NB	NB
Directions Served	LR	L	T
Maximum Queue (m)	26.5	9.1	11.0
Average Queue (m)	10.0	1.4	0.4
95th Queue (m)	19.0	6.8	5.5
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)	74.9	143.4	131.0	74.9	69.7	76.1	75.4	35.7	90.8	97.9	86.2	30.9
Average Queue (m)	52.0	73.3	71.5	37.6	32.4	43.5	36.2	12.2	56.1	54.6	40.4	15.4
95th Queue (m)	87.1	121.1	111.2	82.7	54.6	66.6	61.1	27.9	87.8	84.3	74.3	27.0
Link Distance (m)		833.1	833.1			287.9	287.9			92.4	92.4	
Upstream Blk Time (%)									0	0	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 (%)	29	40	42	3	6	15	19	0	0	0		
Queuing Penalty (veh)	105	70	82	12	14	33	26	0	0	2		

Intersection: 33: Bayview Drive & Big Bay Point Road

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (m)	50.2	72.7	69.3
Average Queue (m)	30.7	27.2	32.9
95th Queue (m)	44.6	51.9	62.5
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)	3	1	7

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)	28.0	58.7	75.9	79.3	41.8	19.4	19.8	21.8	38.5	33.5	78.9	46.5
Average Queue (m)	11.3	29.3	35.7	33.0	20.0	5.2	3.0	2.8	21.2	14.9	32.6	20.2
95th Queue (m)	22.0	52.1	61.8	63.8	37.4	14.1	11.3	12.5	36.6	28.3	62.8	37.9
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				0			0
Queuing Penalty (veh)		0			0				0			0

Intersection: 39: Bryne Drive & Mapleview Drive W

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (m)	30.7	18.6
Average Queue (m)	12.7	8.0
95th Queue (m)	26.1	17.1
Link Distance (m)	172.2	172.2
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
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)	6.9	82.9	76.8	8.6	42.5	65.7	67.2	16.2	21.9	42.0	28.6	17.3
Average Queue (m)	0.6	50.5	42.2	0.5	18.0	37.5	41.5	4.8	7.4	23.1	11.0	5.1
95th Queue (m)	4.3	74.5	69.9	3.9	34.9	58.4	61.9	13.7	17.1	37.0	24.2	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	1		0	0	1					
Queuing Penalty (veh)		0	0		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)	73.4	68.4	35.7	20.0
Average Queue (m)	41.5	20.5	14.3	5.9
95th Queue (m)	65.7	45.5	28.9	14.4
Link Distance (m)		249.9	249.9	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)	60.0			60.0
Storage Blk Time (%)	3	0		
Queuing Penalty (veh)	4	0		

Network Summary

Network wide Queuing Penalty: 1633

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	735	1944	1655	1124	529	512
v/c Ratio	0.97	0.54	0.71	0.71	0.77	0.87
Control Delay	57.2	12.5	23.9	6.2	57.5	60.0
Queue Delay	0.0	1.3	0.0	0.0	0.0	0.0
Total Delay	57.2	13.8	23.9	6.2	57.5	60.0
Queue Length 50th (m)	~113.5	145.2	79.1	44.3	68.7	67.0
Queue Length 95th (m)	m#145.3	156.4	m89.7	m107.0	89.0	#91.2
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	755	3567	2327	1583	739	634
Starvation Cap Reductn	0	1319	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	0.97	0.86	0.71	0.71	0.72	0.81

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	1655	1124	529	0	512	0	0	0
Future Volume (vph)	735	1944	0	0	1655	1124	529	0	512	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	1655	1124	529	0	512	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	1655	1124	529	0	465	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)	28.6	92.1			59.5	130.0	25.9		25.9			
Effective Green, g (s)	28.6	92.1			59.5	130.0	25.9		25.9			
Actuated g/C Ratio	0.22	0.71			0.46	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)	755	3567			2327	1583	683		544			
v/s Ratio Prot	c0.21	0.39			0.33		0.15					
v/s Ratio Perm						c0.71			0.17			
v/c Ratio	0.97	0.54			0.71	0.71	0.77		0.85			
Uniform Delay, d1	50.3	9.0			28.3	0.0	49.3		50.2			
Progression Factor	0.73	1.30			0.81	1.00	1.00		1.00			
Incremental Delay, d2	18.2	0.3			0.8	1.1	5.5		12.4			
Delay (s)	54.8	12.0			23.7	1.1	54.8		62.6			
Level of Service	D	B			C	A	D		E			
Approach Delay (s)		23.8			14.6			58.6			0.0	
Approach LOS		C			B			E			A	

Intersection Summary

HCM 2000 Control Delay	25.4	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)	16.0
Intersection Capacity Utilization	88.2%	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	1787	64	60	1497	236	827	80	205	50	456
v/c Ratio	0.83	0.89	0.09	0.37	0.94	0.38	0.92	0.17	0.93	0.21	0.85
Control Delay	76.4	24.2	0.3	24.3	44.4	6.0	62.2	33.4	100.9	54.9	51.4
Queue Delay	0.0	0.0	0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.4	24.2	0.3	24.3	47.2	6.0	62.2	33.4	100.9	54.9	51.4
Queue Length 50th (m)	47.5	167.0	0.3	6.1	148.9	3.7	110.6	14.6	56.0	12.5	99.8
Queue Length 95th (m)	m#74.4	#196.3	m0.0	m9.1	#170.1	m9.6	#144.7	28.2	#107.5	25.6	#160.9
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)	462	2018	708	163	1588	613	933	494	221	233	539
Starvation Cap Reductn	0	0	0	0	47	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	0.83	0.89	0.09	0.37	0.97	0.38	0.89	0.16	0.93	0.21	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)	383	1787	64	60	1497	236	827	65	15	205	50	456
Future Volume (vph)	383	1787	64	60	1497	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	184	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	1787	64	60	1497	236	827	65	15	205	50	456
RTOR Reduction (vph)	0	0	38	0	0	131	0	7	0	0	0	57
Lane Group Flow (vph)	383	1787	26	60	1497	105	827	73	0	205	50	399
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)	17.2	52.3	52.3	46.9	41.0	41.0	33.9	33.9		15.9	15.9	33.1
Effective Green, g (s)	17.2	52.3	52.3	46.9	41.0	41.0	33.9	33.9		15.9	15.9	33.1
Actuated g/C Ratio	0.13	0.40	0.40	0.36	0.32	0.32	0.26	0.26		0.12	0.12	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)	463	1987	634	139	1588	482	904	472		220	232	411
v/s Ratio Prot	0.11	c0.36		0.02	0.30		c0.24	0.04		0.11	0.03	c0.13
v/s Ratio Perm			0.02	0.14		0.07						0.12
v/c Ratio	0.83	0.90	0.04	0.43	0.94	0.22	0.91	0.16		0.93	0.22	0.97
Uniform Delay, d1	55.0	36.4	23.6	30.7	43.4	32.7	46.6	37.0		56.5	51.4	48.0
Progression Factor	1.15	0.51	0.08	1.04	0.80	0.60	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	12.8	5.8	0.1	1.5	9.5	0.7	13.5	0.2		41.9	0.5	36.8
Delay (s)	76.2	24.3	2.0	33.5	44.0	20.3	60.2	37.2		98.5	51.9	84.8
Level of Service	E	C	A	C	D	C	E	D		F	D	F
Approach Delay (s)		32.6			40.5			58.1			86.4	
Approach LOS		C			D			E			F	

Intersection Summary

HCM 2000 Control Delay	46.0	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	94.1%	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)	132.6	148.6	130.6	123.9	94.9	130.8	90.5	62.5	94.1	90.0	137.0	88.2
Average Queue (m)	91.2	95.4	44.7	36.5	40.5	67.5	42.3	42.8	51.4	59.6	61.2	53.8
95th Queue (m)	149.1	161.5	106.6	86.7	83.1	110.7	70.4	59.0	82.4	86.1	106.8	81.1
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	0								0	
Queuing Penalty (veh)		7	0								0	
Storage Bay Dist (m)	130.0								130.0	265.0		
Storage Blk Time (%)	3	5										
Queuing Penalty (veh)	11	17										

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

Movement	NB
Directions Served	R
Maximum Queue (m)	80.7
Average Queue (m)	38.3
95th Queue (m)	71.9
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)	67.8	72.1	100.4	77.0	92.8	13.8	57.3	136.4	136.8	144.1	165.2	57.4
Average Queue (m)	39.0	43.8	48.3	45.0	56.9	4.2	15.3	68.9	106.6	129.5	117.6	56.0
95th Queue (m)	59.5	63.2	78.8	68.3	83.5	11.2	42.8	120.1	147.4	150.6	216.3	64.6
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)								1	1	12	12	
Queuing Penalty (veh)								3	2	53	53	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)							0	16				7
Queuing Penalty (veh)							0	10				29

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	135.0	66.5	100.3	100.6
Average Queue (m)	133.6	84.6	53.1	59.8	92.4
95th Queue (m)	135.9	178.2	77.7	131.5	122.8
Link Distance (m)	128.7	128.7		96.0	96.0
Upstream Blk Time (%)	73	15		18	51
Queuing Penalty (veh)	0	0		0	0
Storage Bay Dist (m)			60.0		
Storage Blk Time (%)	66		31		
Queuing Penalty (veh)	273		16		

Zone Summary

Zone wide Queuing Penalty: 473

Appendix C

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 o Provision of a southbound right turn overlap[1]

3	- Existing base year PM peak hour traffic volumes
	- Dual southbound right turn lane configuration
	  o 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
	  o No right turns on red allowed[2]
	  o ***Without*** the provision of a southbound right turn overlap

4	- Existing base year PM peak hour traffic volumes
	- Dual southbound right turn lane configuration
	  o 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
	  o No right turns on red allowed[2]
	  o ***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.

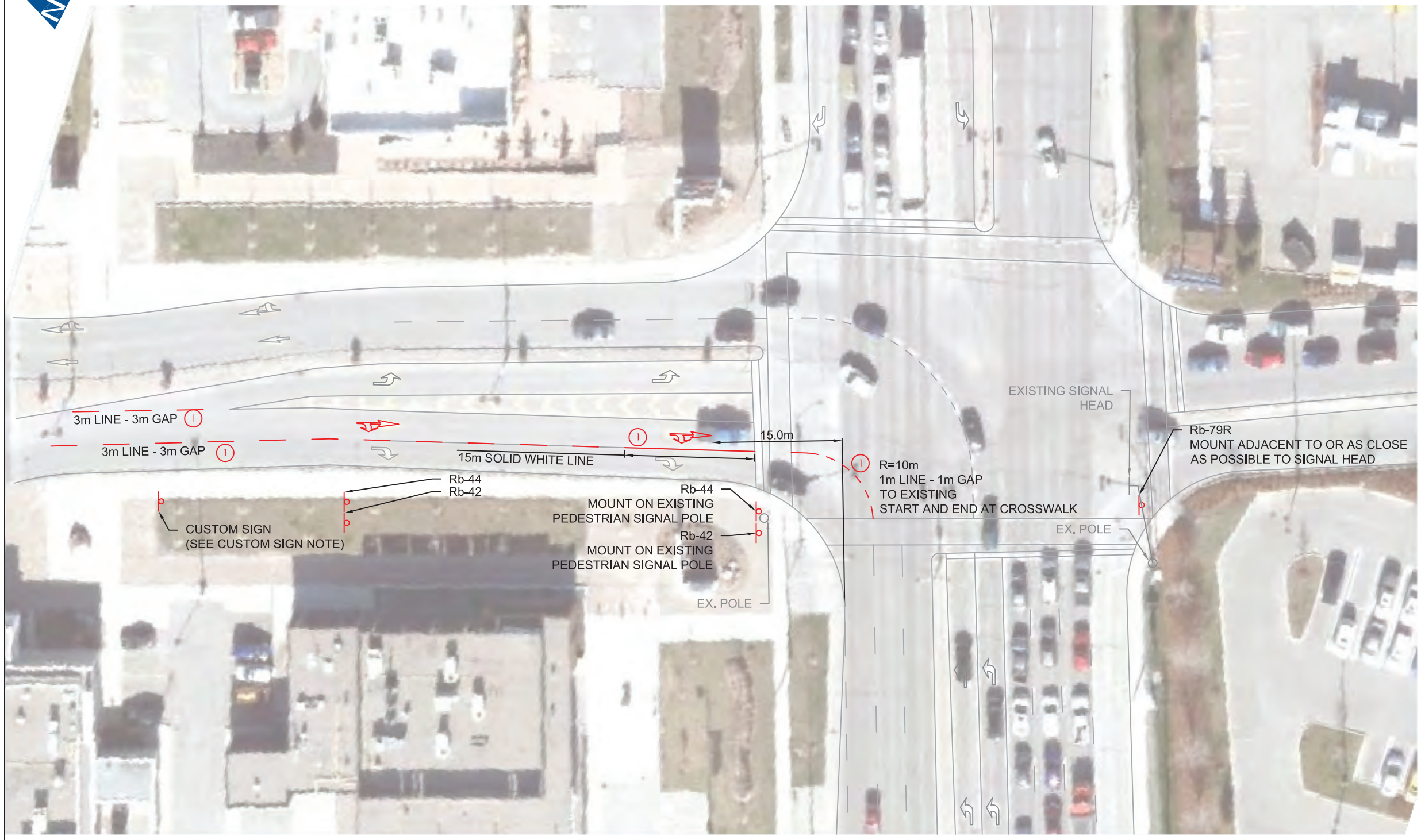
If you have any questions for comments regarding the analysis, functional drawing, or conclusions, please call or e-mail the undersigned.

Yours truly,

PARADIGM TRANSPORTATION SOLUTIONS LIMITED

Garry Pappin
BES, CET, LEL
Senior Project Manager

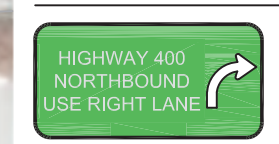
Attach.



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 D

2026 Total Synchro Analysis

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.

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

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.

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 E

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	59.6	6.0	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	59.6	6.1	31.8	48.2	11.9	52.3	30.2
Queue Length 50th (m)	0.4	7.3	42.3	48.1	0.9	0.9	0.0	50.8	2.5
Queue Length 95th (m)	m0.7	9.0	m57.4	61.7	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		1.22	0.35		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		57.2	7.2		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			15.0			46.5			42.9	
Approach LOS		A			B			D			D	

Intersection Summary

HCM 2000 Control Delay	15.1	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	413	1646	654	688
v/c Ratio	0.68	0.31	0.94	0.55	0.69	0.84
Control Delay	21.2	3.5	46.3	10.6	38.9	43.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.2	3.5	46.3	10.6	38.9	43.1
Queue Length 50th (m)	89.7	5.4	64.0	87.3	66.8	74.4
Queue Length 95th (m)	79.3	m4.3	#132.3	123.2	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)	2122	613	479	3008	1071	916
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	20	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.31	0.86	0.55	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	413	1646	0	0	0	0	654	0	688
Future Volume (vph)	0	1435	188	413	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	413	1646	0	0	0	0	654	0	688
RTOR Reduction (vph)	0	0	90	0	0	0	0	0	0	0	0	50
Lane Group Flow (vph)	0	1435	98	413	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)		37.5	37.5	67.0	67.0					31.0		31.0
Effective Green, g (s)		37.5	37.5	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)		2122	524	439	3008					948		770
v/s Ratio Prot		0.23		c0.22	0.33					0.19		
v/s Ratio Perm			0.06	c0.35								c0.23
v/c Ratio		0.68	0.19	0.94	0.55					0.69		0.83
Uniform Delay, d1		31.1	25.5	31.5	12.6					35.2		37.0
Progression Factor		0.60	0.24	0.67	0.76					1.00		1.00
Incremental Delay, d2		1.6	0.7	24.5	0.6					2.1		7.4
Delay (s)		20.2	6.7	45.6	10.1					37.3		44.4
Level of Service		C	A	D	B					D		D
Approach Delay (s)		18.7			17.2			0.0			40.9	
Approach LOS		B			B			A			D	

Intersection Summary

HCM 2000 Control Delay	24.0	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	1618	730	441	221
v/c Ratio	0.67	0.50	0.62	0.66	0.74	0.42
Control Delay	39.3	7.0	5.0	5.8	49.7	28.5
Queue Delay	0.0	0.3	0.0	1.2	0.0	0.0
Total Delay	39.3	7.2	5.0	7.0	49.7	28.5
Queue Length 50th (m)	21.9	103.4	15.5	1.4	49.0	17.1
Queue Length 95th (m)	33.6	121.1	m19.2	m30.0	62.4	28.2
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	508	3556	2597	1112	825	703
Starvation Cap Reductn	0	914	0	188	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.68	0.62	0.79	0.53	0.31

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	1618	730	441	0	221	0	0	0
Future Volume (vph)	299	1790	0	0	1618	730	441	0	221	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	1618	730	441	0	221	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	333	0	0	56	0	0	0
Lane Group Flow (vph)	299	1790	0	0	1618	397	441	0	165	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	77.7			58.4	58.4	20.3		20.3			
Effective Green, g (s)	15.3	77.7			58.4	58.4	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)	446	3557			2597	779	598		472			
v/s Ratio Prot	c0.09	0.36			c0.33		c0.14					
v/s Ratio Perm						0.27			0.06			
v/c Ratio	0.67	0.50			0.62	0.51	0.74		0.35			
Uniform Delay, d1	45.0	7.4			18.1	16.6	42.3		39.1			
Progression Factor	0.75	0.84			0.23	2.28	1.00		1.00			
Incremental Delay, d2	3.0	0.4			0.5	1.1	4.7		0.4			
Delay (s)	36.6	6.5			4.7	38.9	47.1		39.5			
Level of Service	D	A			A	D	D		D			
Approach Delay (s)		10.8			15.4			44.6			0.0	
Approach LOS		B			B			D			A	

Intersection Summary

HCM 2000 Control Delay	17.3	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	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	1491	28	13	2000	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	4.8	0.0	4.4	21.2	0.3	51.0	24.2	49.7	46.5	16.9
Queue Delay	0.0	0.0	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.4	4.8	0.0	4.4	23.1	0.3	51.0	24.2	49.7	46.5	16.9
Queue Length 50th (m)	39.0	13.4	0.0	0.4	47.7	0.1	19.2	2.5	5.9	2.2	0.0
Queue Length 95th (m)	55.0	34.2	m0.0	m0.6	m#201.7	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	263	2088	708	1103	555	139	146	287
Starvation Cap Reductn	0	0	0	0	39	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	1491	28	13	2000	90	171	12	27	27	10	178
Future Volume (vph)	321	1491	28	13	2000	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	311	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	1491	28	13	2000	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	1491	17	13	2000	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	156	2089	635	356	173		139	146	123
v/s Ratio Prot	c0.10	0.30		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	0.50	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	30.3	18.3	46.6	44.7		47.5	47.1	47.2
Progression Factor	1.49	0.37	1.00	0.50	0.44	0.07	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	0.5	0.0	0.1	6.0	0.1	1.0	0.2		0.7	0.2	0.4
Delay (s)	60.1	5.0	8.6	8.7	19.3	1.4	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)		14.7			18.5			47.1			47.7	
Approach LOS		B			B			D			D	

Intersection Summary

HCM 2000 Control Delay	19.7	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)	394	861	289	59	1676	104	63	351	175	466
v/c Ratio	0.96	0.39	0.36	0.18	0.95	0.51	0.08	0.80	0.20	0.93
Control Delay	94.5	15.1	3.1	15.3	46.6	58.9	12.9	44.2	30.9	50.9
Queue Delay	0.0	0.0	0.0	0.0	12.2	0.0	0.0	0.0	0.0	0.3
Total Delay	94.5	15.1	3.1	15.3	58.8	58.9	12.9	44.2	30.9	51.2
Queue Length 50th (m)	~61.3	30.2	2.6	6.6	132.4	11.9	1.7	57.5	15.4	66.0
Queue Length 95th (m)	#95.0	26.4	14.2	13.7	#167.0	21.1	7.0	#94.2	24.3	#126.3
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)	409	2196	803	333	1768	205	957	441	975	545
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	121	0	0	0	0	4
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.39	0.36	0.18	1.02	0.51	0.07	0.80	0.18	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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	394	861	289	59	1534	142	104	21	42	351	175	466
Future Volume (vph)	394	861	289	59	1534	142	104	21	42	351	175	466
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	3094		1626	3252	1417
Flt Permitted	0.95	1.00	1.00	0.32	1.00		0.95	1.00		0.62	1.00	1.00
Satd. Flow (perm)	3213	4988	1458	573	4899		3019	3094		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)	394	861	289	59	1534	142	104	21	42	351	175	466
RTOR Reduction (vph)	0	0	167	0	10	0	0	32	0	0	0	125
Lane Group Flow (vph)	394	861	122	59	1666	0	104	31	0	351	175	341
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)	14.0	46.4	46.4	44.2	38.3		7.4	25.2		41.7	30.3	30.3
Effective Green, g (s)	14.0	46.4	46.4	44.2	38.3		7.4	25.2		41.7	30.3	30.3
Actuated g/C Ratio	0.13	0.42	0.42	0.40	0.35		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)	408	2104	615	291	1705		203	708		464	895	390
v/s Ratio Prot	c0.12	0.17		0.01	c0.34		0.03	0.01		c0.09	0.05	
v/s Ratio Perm			0.08	0.07						0.20		c0.24
v/c Ratio	0.97	0.41	0.20	0.20	0.98		0.51	0.04		0.76	0.20	0.88
Uniform Delay, d1	47.8	22.2	20.1	20.4	35.4		49.6	33.0		28.6	30.5	38.0
Progression Factor	1.31	0.65	0.71	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	33.2	0.5	0.6	0.3	17.0		2.2	0.0		6.9	0.1	19.1
Delay (s)	95.6	15.0	14.9	20.7	52.4		51.7	33.0		35.5	30.6	57.2
Level of Service	F	B	B	C	D		D	C		D	C	E
Approach Delay (s)		35.5			51.4			44.7			44.8	
Approach LOS		D			D			D			D	

Intersection Summary

HCM 2000 Control Delay	44.2	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	88.5%	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	496	7	994
v/c Ratio	0.20	0.11	0.01	0.15	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	10.7	0.3	45.3
Queue Length 95th (m)	7.5	8.0	0.0	7.3	34.6	1.7	81.3
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	746	389	2639	757	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	0.15	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	478	18	7	945	49
Future Volume (vph)	36	0	33	14	0	6	60	478	18	7	945	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		383	3394		894	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	478	18	7	945	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	495	0	7	992	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		348	2385		615	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	8.4	
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	0.42		
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	469	5	1024
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	4.4	3.6	7.7
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	4.4	3.6	7.7
Queue Length 50th (m)	6.8	0.0	0.9	1.6	10.2	0.2	46.7
Queue Length 95th (m)	16.3	0.0	4.9	6.2	32.8	1.3	83.8
Internal Link Dist (m)					199.1		252.7
Turn Bay Length (m)	25.0			70.0		70.0	
Base Capacity (vph)	234	430	160	518	2810	830	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	469	0	5	971	53
Future Volume (vph)	39	0	25	5	0	0	50	469	0	5	971	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			460	3406		918	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	469	0	5	971	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	469	0	5	1022	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			401	2458		659	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			0.12	0.19		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			7.4	
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	0.42		
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	409	74	1010
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	1.4	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	1.4	6.2	10.0	5.3	11.9
Queue Length 50th (m)	6.8	0.0	6.1	0.0	1.7	20.8	4.4	64.8
Queue Length 95th (m)	14.0	0.0	15.0	0.0	4.8	31.2	9.2	87.4
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	589	259	697	257	2097	679	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	408	1	74	970	40
Future Volume (vph)	33	0	23	36	0	189	30	408	1	74	970	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		0.50	1.00	
Satd. Flow (perm)	943		1593	1028	1346		262	3404		853	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	408	1	74	970	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	409	0	74	1008	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		197	2033		612	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	0.20		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	9.7		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	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	14	6	560	54	14	907
Future Volume (Veh/h)	14	6	560	54	14	907
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)	14	6	560	54	14	907
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	
vC, conflicting volume	1068	307			614	
vC1, stage 1 conf vol	587					
vC2, stage 2 conf vol	482					
vCu, unblocked vol	1029	252			565	
tC, single (s)	7.6	6.9			4.2	
tC, 2 stage (s)	6.6					
tF (s)	3.9	3.3			2.3	
p0 queue free %	96	99			99	
cM capacity (veh/h)	356	739			956	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	20	373	241	14	454	454
Volume Left	14	0	0	14	0	0
Volume Right	6	0	54	0	0	0
cSH	421	1700	1700	956	1700	1700
Volume to Capacity	0.05	0.22	0.14	0.01	0.27	0.27
Queue Length 95th (m)	1.2	0.0	0.0	0.4	0.0	0.0
Control Delay (s)	14.0	0.0	0.0	8.8	0.0	0.0
Lane LOS	B			A		
Approach Delay (s)	14.0	0.0		0.1		
Approach LOS	B					

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	35.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	28	126	465	896	33
Future Volume (Veh/h)	13	28	126	465	896	33
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)	13	28	126	465	896	33
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	1397	464	929			
vC1, stage 1 conf vol	912					
vC2, stage 2 conf vol	484					
vCu, unblocked vol	1397	464	929			
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 %	96	95	83			
cM capacity (veh/h)	300	550	744			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	13	28	126	232	232	597	332
Volume Left	13	0	126	0	0	0	0
Volume Right	0	28	0	0	0	0	33
cSH	300	550	744	1700	1700	1700	1700
Volume to Capacity	0.04	0.05	0.17	0.14	0.14	0.35	0.20
Queue Length 95th (m)	1.1	1.3	4.9	0.0	0.0	0.0	0.0
Control Delay (s)	17.6	11.9	10.8	0.0	0.0	0.0	0.0
Lane LOS	C	B	B				
Approach Delay (s)	13.7		2.3			0.0	
Approach LOS	B						

Intersection Summary			
Average Delay	1.2		
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)	11	6	25	431	884	26
Future Volume (Veh/h)	11	6	25	431	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)	11	6	25	431	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	0.97	0.97	0.97			
vC, conflicting volume	1162	455	910			
vC1, stage 1 conf vol	897					
vC2, stage 2 conf vol	266					
vCu, unblocked vol	1097	364	835			
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)	360	616	779			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	17	25	216	216	589	321
Volume Left	11	25	0	0	0	0
Volume Right	6	0	0	0	0	26
cSH	422	779	1700	1700	1700	1700
Volume to Capacity	0.04	0.03	0.13	0.13	0.35	0.19
Queue Length 95th (m)	1.0	0.8	0.0	0.0	0.0	0.0
Control Delay (s)	13.9	9.8	0.0	0.0	0.0	0.0
Lane LOS	B	A				
Approach Delay (s)	13.9	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)	136	636	323	383	634	232	91	340	51	202	288
v/c Ratio	0.36	0.57	0.52	0.77	0.44	0.31	0.24	0.39	0.16	0.23	0.56
Control Delay	16.3	34.0	18.5	25.3	23.0	7.8	26.9	34.8	25.8	34.1	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	16.3	34.0	18.5	25.3	23.0	7.8	26.9	34.8	25.8	34.1	9.0
Queue Length 50th (m)	14.2	62.4	26.9	47.0	53.0	9.6	13.4	32.1	7.3	18.8	0.0
Queue Length 95th (m)	23.9	93.0	62.9	71.9	68.4	25.4	28.7	51.5	18.0	32.7	26.0
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)	383	1114	616	620	1749	881	381	874	326	883	514
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.57	0.52	0.62	0.36	0.26	0.24	0.39	0.16	0.23	0.56

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	136	636	323	383	634	232	91	297	43	51	202	288
Future Volume (vph)	136	636	323	383	634	232	91	297	43	51	202	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	1594	3308		1610	3374	1152
Flt Permitted	0.41	1.00	1.00	0.26	1.00	1.00	0.62	1.00		0.49	1.00	1.00
Satd. Flow (perm)	710	3406	1538	469	3343	1538	1049	3308		833	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)	136	636	323	383	634	232	91	297	43	51	202	288
RTOR Reduction (vph)	0	0	113	0	0	92	0	9	0	0	0	213
Lane Group Flow (vph)	136	636	210	383	634	140	91	331	0	51	202	75
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)	44.0	35.4	35.4	59.1	46.5	46.5	33.6	28.2		33.6	28.2	28.2
Effective Green, g (s)	44.0	35.4	35.4	59.1	46.5	46.5	33.6	28.2		33.6	28.2	28.2
Actuated g/C Ratio	0.40	0.33	0.33	0.54	0.43	0.43	0.31	0.26		0.31	0.26	0.26
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)	361	1109	500	484	1430	657	351	858		296	875	298
v/s Ratio Prot	0.03	0.19		c0.14	0.19		c0.01	c0.10		0.01	0.06	
v/s Ratio Perm	0.12		0.14	c0.29		0.09	0.07			0.04		0.06
v/c Ratio	0.38	0.57	0.42	0.79	0.44	0.21	0.26	0.39		0.17	0.23	0.25
Uniform Delay, d1	21.0	30.4	28.6	16.6	22.0	19.6	27.5	33.1		26.8	31.7	31.9
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	0.7	0.7	0.6	8.6	0.2	0.2	0.4	1.3		0.3	0.6	2.0
Delay (s)	21.7	31.1	29.2	25.2	22.2	19.7	27.9	34.4		27.1	32.3	33.9
Level of Service	C	C	C	C	C	B	C	C		C	C	C
Approach Delay (s)		29.4			22.6			33.1			32.7	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	108.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	92.9%	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	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	50.0	6.2	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	50.0	6.2	43.5	22.4	36.1	20.3
Queue Length 50th (m)	2.4	81.5	67.4	17.1	17.8	1.7	5.3	6.0
Queue Length 95th (m)	5.6	108.5	100.9	29.5	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		2.22	0.58		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		56.5	6.5		41.9	43.5		41.8	45.8	
Level of Service	B	C		E	A		D	D		D	D	
Approach Delay (s)		24.2			17.7			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	524	11	78	360	159	15	110	105	136	270	87
v/c Ratio	0.02	0.33	0.02	0.23	0.22	0.20	0.03	0.07	0.14	0.24	0.17	0.12
Control Delay	18.3	21.7	1.9	22.2	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	21.7	1.9	22.2	20.4	3.5	19.1	19.2	4.1	22.1	20.3	4.4
Queue Length 50th (m)	1.2	42.7	0.0	11.5	27.8	0.0	2.0	8.0	0.0	20.5	20.6	0.0
Queue Length 95th (m)	4.4	56.1	1.4	23.1	38.4	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)	440	1607	733	346	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	0.33	0.02	0.23	0.22	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	524	11	78	360	159	15	110	105	136	270	87
Future Volume (vph)	9	524	11	78	360	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	0.52	1.00	1.00	0.41	1.00	1.00	0.59	1.00	1.00	0.68	1.00	1.00
Satd. Flow (perm)	969	3539	1583	761	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	524	11	78	360	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	524	5	78	360	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)	440	1607	718	345	1607	718	486	1577	705	566	1577	705
v/s Ratio Prot		c0.15			0.10			0.03			0.08	
v/s Ratio Perm	0.01		0.00	0.10		0.05	0.01		0.03	c0.11		0.02
v/c Ratio	0.02	0.33	0.01	0.23	0.22	0.10	0.03	0.07	0.07	0.24	0.17	0.06
Uniform Delay, d1	18.0	21.0	17.9	19.9	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	0.5	0.0	1.5	0.3	0.3	0.1	0.1	0.2	1.0	0.2	0.1
Delay (s)	18.1	21.5	18.0	21.4	20.2	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)		21.4			20.1			19.1			20.4	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	48.0%	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)	30.9	71.6	82.8	63.5	62.7	2.5	5.8	61.2	62.2	59.6	74.7	87.6
Average Queue (m)	6.7	25.2	30.6	18.2	16.9	0.1	0.2	34.3	40.7	29.4	37.6	51.1
95th Queue (m)	20.2	60.2	68.9	51.6	42.9	1.8	4.1	52.5	57.2	53.9	63.9	79.1
Link Distance (m)		86.5	86.5	86.5	86.5	66.0	66.0			114.0	114.0	114.0
Upstream Blk Time (%)		1	1	0	0							
Queuing Penalty (veh)		2	3	0	0							
Storage Bay Dist (m)	70.0							65.0	65.0			
Storage Blk Time (%)		1						0	0	0		
Queuing Penalty (veh)		0						0	1	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)	9.8	9.5	43.2	47.4	101.6	53.5
Average Queue (m)	1.4	1.0	19.8	41.0	37.7	7.7
95th Queue (m)	6.8	5.9	36.5	54.5	109.6	44.7
Link Distance (m)		85.8	85.8		180.4	180.4
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					0	
Storage Bay Dist (m)	20.0			40.0		
Storage Blk Time (%)		0		29	0	
Queuing Penalty (veh)		0		4	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)	114.7	118.0	112.8	100.4	73.6	127.9	129.6	81.6	82.9	242.4	242.9	178.5
Average Queue (m)	61.2	73.3	55.7	41.4	11.8	60.9	47.7	38.2	49.9	138.3	157.4	57.1
95th Queue (m)	117.3	121.6	106.0	74.8	38.8	107.2	90.5	67.6	75.4	258.3	262.9	125.6
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					
Queuing Penalty (veh)	6	7	1	0			0					
Storage Bay Dist (m)					45.0	135.0				300.0		
Storage Blk Time (%)				5		1						
Queuing Penalty (veh)				9		3						

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

Movement	SB
Directions Served	R
Maximum Queue (m)	149.5
Average Queue (m)	46.2
95th Queue (m)	103.4
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)	54.7	55.3	102.6	74.0	75.3	103.9	60.6	51.2	84.4	78.3	76.4	47.2
Average Queue (m)	24.0	24.5	15.4	11.6	14.6	46.2	20.9	23.3	48.6	43.9	42.7	22.9
95th Queue (m)	43.1	44.2	60.7	44.8	50.1	84.0	45.0	40.4	74.0	69.8	67.4	41.3
Link Distance (m)		168.4	168.4	168.4	168.4	218.3	218.3	218.3			335.8	335.8
Upstream Blk Time (%)												
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)	37.5
Average Queue (m)	8.7
95th Queue (m)	24.2
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)	53.6	61.9	62.9	47.7	60.1	16.8	48.8	136.5	142.4	142.2	162.0	39.6
Average Queue (m)	32.5	38.4	30.8	24.5	35.0	2.0	4.6	78.0	88.4	112.2	55.7	10.6
95th Queue (m)	47.7	54.5	52.2	40.2	53.2	9.0	21.9	133.3	147.9	159.1	165.6	25.6
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)								1	1	6	4	
Queuing Penalty (veh)								4	4	34	22	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)								23				0
Queuing Penalty (veh)								3				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)	52.7	19.4	18.4	14.6	58.1
Average Queue (m)	24.4	6.2	5.3	2.4	24.3
95th Queue (m)	42.0	15.9	14.5	9.1	44.3
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)	76.3	79.5	43.8	27.9	31.1	44.0	97.5	254.9	255.3	259.4	29.0	48.3
Average Queue (m)	44.2	45.8	8.6	11.6	14.1	16.6	14.5	181.3	224.4	234.8	9.0	20.7
95th Queue (m)	67.5	68.8	27.1	23.9	27.6	35.1	59.6	297.9	304.6	297.8	23.5	40.0
Link Distance (m)			131.2	131.2	131.2			244.4	244.4	244.4		
Upstream Blk Time (%)								5	29	63		
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		8				
Queuing Penalty (veh)	3	4				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)	25.8	21.4	117.5	220.0	210.1	80.0
Average Queue (m)	5.5	5.3	114.3	186.6	65.8	49.0
95th Queue (m)	16.7	13.6	134.6	284.4	171.8	95.8
Link Distance (m)	218.2	218.2		214.5	214.5	
Upstream Blk Time (%)				29	0	
Queuing Penalty (veh)				143	0	
Storage Bay Dist (m)			110.0			45.0
Storage Blk Time (%)			76	5	1	17
Queuing Penalty (veh)			66	18	5	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)	21.9	23.8	24.6	9.1	31.0	53.3	49.6	47.4	152.7	160.2
Average Queue (m)	8.5	7.4	5.7	1.2	10.6	12.9	13.4	3.6	79.3	75.2
95th Queue (m)	18.8	18.1	18.0	6.2	23.4	40.3	37.1	24.9	189.4	183.8
Link Distance (m)	126.0	126.0	60.2	60.2		214.5	214.5		195.2	195.2
Upstream Blk Time (%)									8	4
Queuing Penalty (veh)									41	19
Storage Bay Dist (m)					70.0			50.0		
Storage Blk Time (%)						0			36	
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)	22.2	26.1	10.3	19.4	38.7	36.6	35.3	113.2	131.2
Average Queue (m)	8.0	8.6	1.9	5.9	5.8	7.2	1.5	43.9	51.1
95th Queue (m)	18.4	22.6	7.7	14.6	22.4	23.8	16.3	148.1	154.1
Link Distance (m)		71.5	75.9		195.2	195.2		247.7	247.7
Upstream Blk Time (%)								2	3
Queuing Penalty (veh)								11	14
Storage Bay Dist (m)	25.0			70.0			70.0		
Storage Blk Time (%)	0							9	
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)	17.6	13.9	30.9	43.8	42.7	40.7	41.8	40.4	94.5	102.4
Average Queue (m)	6.2	4.5	7.8	20.3	10.5	12.5	11.3	11.8	37.2	43.3
95th Queue (m)	14.8	11.9	20.3	34.1	28.0	31.9	30.6	35.5	107.6	114.0
Link Distance (m)				212.1		247.7	247.7		206.7	206.7
Upstream Blk Time (%)									1	1
Queuing Penalty (veh)									5	5
Storage Bay Dist (m)	50.0	50.0	30.0		70.0			65.0		
Storage Blk Time (%)			0	2					5	
Queuing Penalty (veh)			0	1					4	

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

Movement	WB	NB	NB	SB	SB	SB
Directions Served	LR	T	TR	L	T	T
Maximum Queue (m)	26.6	1.4	2.3	10.2	12.0	10.8
Average Queue (m)	6.3	0.0	0.1	1.5	1.0	1.1
95th Queue (m)	20.2	1.0	1.6	7.0	11.6	11.8
Link Distance (m)	182.2	206.7	206.7		208.0	208.0
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)				15.0		
Storage Blk Time (%)				0	1	
Queuing Penalty (veh)				0	0	

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)	10.5	11.9	20.9	23.4	9.0	1.2	6.8
Average Queue (m)	3.2	5.9	11.6	1.0	0.3	0.0	0.4
95th Queue (m)	10.3	13.2	19.7	10.7	6.4	0.9	3.4
Link Distance (m)	102.1	102.1		208.0	208.0	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)	11.6	9.2
Average Queue (m)	3.6	3.1
95th Queue (m)	11.0	10.1
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)	74.6	104.6	104.3	75.0	92.6	106.3	81.3	38.5	43.8	68.2	61.0	30.3
Average Queue (m)	25.2	51.4	52.8	31.0	54.4	45.1	40.3	14.9	18.4	41.2	21.3	10.2
95th Queue (m)	50.0	83.0	83.2	65.2	85.9	77.8	66.7	28.3	35.2	66.0	50.2	23.1
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	34	34	7	19	9	19	1				0
Queuing Penalty (veh)	22	46	111	23	62	35	44	2				0

Intersection: 33: Bayview Drive & Big Bay Point Road

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (m)	42.8	57.9	67.6
Average Queue (m)	24.2	15.7	36.8
95th Queue (m)	40.4	38.9	64.6
Link Distance (m)	101.3	101.3	
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		0	
Storage Bay Dist (m)			50.0
Storage Blk Time (%)	1		5
Queuing Penalty (veh)	0		5

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	91.7	105.3	108.6	32.3	86.7	67.1	59.6	26.2	15.8	52.6	23.6
Average Queue (m)	11.0	47.3	59.7	55.7	31.1	55.8	37.5	34.6	2.8	0.9	22.7	3.0
95th Queue (m)	34.7	77.9	92.5	93.6	35.3	97.5	65.7	54.3	16.3	9.3	45.8	11.8
Link Distance (m)		286.7	286.7	286.7		66.0	66.0	66.0	86.5	86.5		103.6
Upstream Blk Time (%)						11	0	0				
Queuing Penalty (veh)						60	2	1				
Storage Bay Dist (m)	60.0				25.0						45.0	
Storage Blk Time (%)		3			44	2					4	
Queuing Penalty (veh)		1			175	8					0	

Intersection: 39: Bryne Drive & Mapleview Drive W

Movement	NB	SB	SB	SB
Directions Served	TR	L	T	TR
Maximum Queue (m)	20.3	26.0	36.3	34.5
Average Queue (m)	6.0	7.4	14.4	13.9
95th Queue (m)	14.8	20.1	28.5	26.2
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)	11.7	69.3	61.0	8.7	38.5	44.8	43.4	31.1	10.3	30.9	14.8	17.5
Average Queue (m)	1.9	39.0	31.8	1.8	15.4	18.7	23.7	12.0	2.8	13.4	3.0	6.6
95th Queue (m)	8.2	59.5	54.3	7.4	31.3	36.6	40.4	23.5	9.1	26.3	9.8	14.0
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									
Queuing Penalty (veh)		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)	45.2	50.4	37.2	16.7
Average Queue (m)	20.4	27.4	11.5	5.8
95th Queue (m)	37.8	43.4	28.2	12.8
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: 1071

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	321	1491	28	13	2000	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	60.2	4.2	0.0	4.1	14.6	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	60.2	4.2	0.0	4.1	14.8	0.2	51.0	24.2	52.1	48.5	5.8
Queue Length 50th (m)	39.0	13.4	0.0	0.4	47.7	0.1	19.2	2.5	5.9	2.2	0.0
Queue Length 95th (m)	54.9	33.6	m0.0	m0.6	m#187.9	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	280	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	1491	28	13	2000	90	171	12	27	27	10	178
Future Volume (vph)	321	1491	28	13	2000	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	311	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	1491	28	13	2000	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	1491	18	13	2000	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	167	2247	683	356	173		80	84	373
v/s Ratio Prot	c0.10	0.30		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	26.9	16.3	46.6	44.7		51.0	50.5	33.2
Progression Factor	1.41	0.40	1.00	0.52	0.45	0.08	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	0.5	0.0	0.1	2.5	0.1	1.0	0.2		2.5	0.6	0.1
Delay (s)	57.0	4.6	7.2	8.0	14.5	1.3	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)		13.8			13.9			47.1			36.7	
Approach LOS		B			B			D			D	

Intersection Summary

HCM 2000 Control Delay	16.6	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

Queuing and Blocking Report
2031 Future Background - AM Peak Hour (Mitigation)

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)	56.1	57.6	60.2	45.8	58.6	10.5	47.4	135.4	135.0	144.6	157.2	32.7
Average Queue (m)	33.6	37.9	27.7	20.8	32.1	1.7	5.2	67.4	77.6	99.7	40.6	11.6
95th Queue (m)	50.4	52.2	50.2	36.8	50.7	7.1	23.7	122.0	139.2	151.1	138.5	26.0
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)								1	1	3	2	
Queuing Penalty (veh)								3	3	18	9	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)							0	17				0
Queuing Penalty (veh)							0	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)	51.3	18.4	20.0	11.9	58.2
Average Queue (m)	23.5	6.4	6.8	2.6	22.7
95th Queue (m)	41.5	15.0	16.9	8.9	43.7
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: 35

Queues
2031 Future Background - AM Peak Hour - DDI

1: West Terminal-E-S

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)	34.6	95.4
Queue Length 95th (m)	41.0	105.0
Internal Link Dist (m)	43.5	23.7
Turn Bay Length (m)		
Base Capacity (vph)	2535	2134
Starvation Cap Reductn	203	0
Spillback Cap Reductn	126	4
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.71	0.67

Intersection Summary

HCM Signalized Intersection Capacity Analysis
2031 Future Background - AM Peak Hour - DDI

1: West Terminal-E-S

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	1618
v/c Ratio	0.83	0.70
Control Delay	19.9	26.0
Queue Delay	0.4	0.0
Total Delay	20.3	26.0
Queue Length 50th (m)	64.9	100.2
Queue Length 95th (m)	73.6	122.2
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	0.70

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	1618	0
Future Volume (vph)	0	1790	0	0	0	0	0	0	0	0	1618	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	1618	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	1618	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									0.70	
Uniform Delay, d1		27.9									23.4	
Progression Factor		0.60									1.00	
Incremental Delay, d2		2.2									1.8	
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	75.8%	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	413	1646	0	0
Future Volume (Veh/h)	0	0	413	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	413	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		1375	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		201	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		414	1091

Direction, Lane #	WB 1	WB 2	WB 3
Volume Total	742	658	658
Volume Left	413	0	0
Volume Right	0	0	0
cSH	1558	1700	1700
Volume to Capacity	0.27	0.39	0.39
Queue Length 95th (m)	8.2	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	58.5%	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	1618	730	0	0
Future Volume (Veh/h)	0	0	1618	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	1618	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	2348				1618	539
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2348				1618	539
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)	213				96	492

Direction, Lane #	WB 1	WB 2	WB 3	WB 4
Volume Total	539	539	539	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	75.8%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBT	NBR
Lane Group Flow (vph)	1790	215
v/c Ratio	0.75	0.18
Control Delay	1.4	17.8
Queue Delay	0.1	0.0
Total Delay	1.5	17.8
Queue Length 50th (m)	0.0	14.5
Queue Length 95th (m)	0.0	22.8
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	0.18

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1790	0	0	0	0	215
Future Volume (vph)	1790	0	0	0	0	215
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	215
RTOR Reduction (vph)	0	0	0	0	0	6
Lane Group Flow (vph)	1790	0	0	0	0	210
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						c0.08
v/c Ratio	0.75					0.18
Uniform Delay, d1	24.0					18.1
Progression Factor	0.00					1.00
Incremental Delay, d2	1.4					0.3
Delay (s)	1.4					18.4
Level of Service	A					B
Approach Delay (s)	1.4			0.0	18.4	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	3.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	75.8%	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)	1618	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	1618	441	0
Future Volume (vph)	0	0	0	1618	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	1618	441	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	1618	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	62.1%	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)	53.1	49.6	45.5	40.3	28.1	24.0
Average Queue (m)	39.9	39.6	29.4	25.7	23.0	17.1
95th Queue (m)	52.7	50.0	45.6	33.0	25.9	29.1
Link Distance (m)	18.6	18.6	18.6	22.8	22.8	22.8
Upstream Blk Time (%)	36	46	33	51	33	9
Queuing Penalty (veh)	196	254	178	244	156	41
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)	23.8	15.5	1.4	64.9	56.5
Average Queue (m)	8.5	2.0	0.1	50.3	36.8
95th Queue (m)	17.6	9.1	1.4	66.9	52.7
Link Distance (m)	22.8	22.8	22.8	37.0	37.0
Upstream Blk Time (%)	0	0		20	7
Queuing Penalty (veh)	2	2		64	21
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)	64.0	64.8	61.7	48.0	48.0	40.1
Average Queue (m)	57.6	56.2	50.0	37.0	37.2	25.5
95th Queue (m)	62.8	64.1	65.1	42.3	43.0	42.6
Link Distance (m)	27.3	27.3	27.3	19.8	19.8	19.8
Upstream Blk Time (%)	40	43	34	56	43	17
Queuing Penalty (veh)	238	259	205	300	234	94
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)	54.0	49.4	21.4
Average Queue (m)	14.5	7.2	1.0
95th Queue (m)	39.5	28.6	8.5
Link Distance (m)	59.5	59.5	59.5
Upstream Blk Time (%)	0	0	
Queuing Penalty (veh)	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)	179.1	160.2	87.0
Average Queue (m)	112.8	94.1	34.4
95th Queue (m)	160.1	144.0	80.6
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)	7.7	18.2	15.4	65.3	58.6
Average Queue (m)	0.9	5.1	2.8	54.5	38.8
95th Queue (m)	5.4	13.9	10.3	66.3	53.0
Link Distance (m)	7.7	7.7	7.7	37.2	37.2
Upstream Blk Time (%)	3	19	11	26	8
Queuing Penalty (veh)	18	106	59	88	27
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)	189.8	165.7	114.8
Average Queue (m)	122.5	105.6	41.7
95th Queue (m)	171.9	152.6	97.8
Link Distance (m)	187.5	187.5	187.5
Upstream Blk Time (%)	0	0	
Queuing Penalty (veh)	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)	3.9	11.1	16.0	52.3	44.8
Average Queue (m)	0.2	1.3	2.0	23.4	10.9
95th Queue (m)	2.1	6.1	10.2	42.1	32.0
Link Distance (m)	20.9	20.9	20.9	48.7	48.7
Upstream Blk Time (%)			0	0	0
Queuing Penalty (veh)			0	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)	69.4	49.8	40.7
Average Queue (m)	29.3	20.4	8.3
95th Queue (m)	55.9	45.7	27.9
Link Distance (m)	54.6	54.6	54.6
Upstream Blk Time (%)	1	0	0
Queuing Penalty (veh)	7	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)	35.7	35.5	36.2	64.6	40.6
Average Queue (m)	24.7	21.0	12.1	43.5	25.7
95th Queue (m)	35.6	33.4	29.3	65.0	45.0
Link Distance (m)	31.8	31.8	31.8	39.6	39.6
Upstream Blk Time (%)	3	1	1	10	1
Queuing Penalty (veh)	18	5	3	22	1
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 2847

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	19.2	75.6	9.8	31.2	50.8	38.0	46.4	19.4
Queue Delay	0.0	0.4	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)	3.3	49.8	43.4	79.9	10.9	22.2	36.8	67.9	2.0
Queue Length 95th (m)	10.8	66.5	59.8	167.4	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	672	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		1.23	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	442	1852	649	264
v/c Ratio	0.79	0.27	0.93	0.53	0.83	0.39
Control Delay	25.3	5.5	42.5	10.9	57.2	33.3
Queue Delay	0.1	0.0	0.0	0.6	0.6	0.0
Total Delay	25.4	5.5	42.5	11.4	57.7	33.3
Queue Length 50th (m)	156.3	4.3	85.7	131.6	85.6	26.1
Queue Length 95th (m)	103.8	m9.5	#163.8	168.2	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)	2583	678	498	3469	906	778
Starvation Cap Reductn	65	0	0	1074	0	0
Spillback Cap Reductn	12	0	0	273	60	2
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.27	0.89	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	442	1852	0	0	0	0	649	0	264
Future Volume (vph)	0	2043	180	442	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	130	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	442	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	442	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)		52.4	52.4	87.8	87.8					30.2		30.2
Effective Green, g (s)		52.4	52.4	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)		2582	625	475	3468					782		634
v/s Ratio Prot		0.32		c0.22	0.36					c0.19		
v/s Ratio Perm			0.08	c0.40								0.08
v/c Ratio		0.79	0.20	0.93	0.53					0.83		0.34
Uniform Delay, d1		34.0	25.2	39.6	10.7					47.5		41.6
Progression Factor		0.66	0.32	0.59	0.93					1.00		1.00
Incremental Delay, d2		2.1	0.6	18.6	0.4					7.3		0.3
Delay (s)		24.4	8.7	42.0	10.4					54.8		42.0
Level of Service		C	A	D	B					D		D
Approach Delay (s)		23.1			16.5			0.0			51.1	
Approach LOS		C			B			A			D	

Intersection Summary

HCM 2000 Control Delay	25.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
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	1823	1027	471	551
v/c Ratio	0.95	0.58	0.76	0.98	0.67	0.90
Control Delay	52.6	15.6	20.5	20.4	52.4	64.2
Queue Delay	0.0	2.3	0.0	18.0	0.0	0.0
Total Delay	52.6	17.9	20.5	38.4	52.4	64.2
Queue Length 50th (m)	82.6	164.0	73.4	57.0	60.1	74.0
Queue Length 95th (m)	#123.8	180.0	m69.0	m48.9	78.8	#107.7
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	689	3533	2392	1047	739	634
Starvation Cap Reductn	0	1308	0	65	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.92	0.76	1.05	0.64	0.87

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	1823	1027	471	0	551	0	0	0
Future Volume (vph)	650	2042	0	0	1823	1027	471	0	551	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	1823	1027	471	0	551	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	1823	724	471	0	504	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)	26.0	91.2			61.2	61.2	26.8		26.8			
Effective Green, g (s)	26.0	91.2			61.2	61.2	26.8		26.8			
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)	686	3532			2393	745	707		563			
v/s Ratio Prot	c0.19	0.41			0.36		0.14					
v/s Ratio Perm						c0.46			c0.18			
v/c Ratio	0.95	0.58			0.76	0.97	0.67		0.90			
Uniform Delay, d1	51.3	9.7			28.4	33.6	47.5		50.2			
Progression Factor	0.68	1.51			0.70	0.97	1.00		1.00			
Incremental Delay, d2	15.7	0.4			0.2	5.3	2.4		16.7			
Delay (s)	50.6	15.2			20.1	38.0	49.9		66.9			
Level of Service	D	B			C	D	D		E			
Approach Delay (s)		23.7			26.5			59.1			0.0	
Approach LOS		C			C			E			A	

Intersection Summary

HCM 2000 Control Delay	30.4	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	1806	67	69	1700	256	659	90	227	50	492
v/c Ratio	1.11	0.95	0.10	0.43	1.07	0.42	0.83	0.21	0.71	0.15	1.22
Control Delay	133.2	29.8	0.4	25.7	70.4	6.3	56.7	33.6	64.5	49.0	150.1
Queue Delay	0.0	0.0	0.0	0.0	12.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	133.2	29.8	0.4	25.7	82.7	6.3	56.7	33.6	64.5	49.0	150.1
Queue Length 50th (m)	~64.4	~177.3	0.1	6.6	~180.1	3.5	87.0	16.2	58.6	11.6	~131.0
Queue Length 95th (m)	m#95.5	#213.0	m0.3	m8.5	#211.6	m8.3	104.7	30.1	#109.8	24.9	#214.2
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)	377	1894	672	163	1588	607	933	492	320	336	404
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	1.11	0.95	0.10	0.42	1.10	0.42	0.71	0.18	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	1806	67	69	1700	256	659	65	25	227	50	492
Future Volume (vph)	417	1806	67	69	1700	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	1806	67	69	1700	256	659	65	25	227	50	492
RTOR Reduction (vph)	0	0	42	0	0	125	0	12	0	0	0	118
Lane Group Flow (vph)	417	1806	25	69	1700	131	659	78	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)	14.0	49.0	49.0	47.0	41.0	41.0	29.9	29.9		23.1	23.1	23.1
Effective Green, g (s)	14.0	49.0	49.0	47.0	41.0	41.0	29.9	29.9		23.1	23.1	23.1
Actuated g/C Ratio	0.11	0.38	0.38	0.36	0.32	0.32	0.23	0.23		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)	377	1862	594	140	1588	482	797	411		320	337	286
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	1.11	0.97	0.04	0.49	1.07	0.27	0.83	0.19		0.71	0.15	1.31
Uniform Delay, d1	58.0	39.8	25.6	32.1	44.5	33.3	47.6	40.3		50.3	45.1	53.5
Progression Factor	1.18	0.46	0.15	1.08	0.72	0.50	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	72.8	12.4	0.1	1.3	38.5	0.7	7.0	0.2		7.0	0.2	160.8
Delay (s)	141.2	30.8	3.9	35.9	70.5	17.4	54.6	40.5		57.3	45.3	214.3
Level of Service	F	C	A	D	E	B	D	D		E	D	F
Approach Delay (s)		50.1			62.6			52.9			157.0	
Approach LOS		D			E			D			F	

Intersection Summary

HCM 2000 Control Delay	68.9	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	97.1%	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)	570	1352	137	52	1454	217	298	345	164	572
v/c Ratio	0.92	0.54	0.19	0.24	0.85	0.82	0.44	0.92	0.20	0.95
Control Delay	80.0	18.6	4.6	18.4	45.6	82.6	38.7	64.3	39.1	48.5
Queue Delay	0.0	0.1	0.0	0.0	8.8	0.0	0.0	0.0	0.0	1.3
Total Delay	80.0	18.7	4.6	18.4	54.3	82.6	38.7	64.3	39.1	49.8
Queue Length 50th (m)	84.6	57.3	4.8	6.3	137.6	30.2	29.1	70.4	17.8	74.3
Queue Length 95th (m)	m89.8	m60.5	m5.7	12.9	#169.1	#51.2	43.3	#120.3	27.7	#146.9
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)	626	2519	740	219	1701	266	781	377	962	641
Starvation Cap Reductn	0	300	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	231	0	0	0	0	14
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.61	0.19	0.24	0.99	0.82	0.38	0.92	0.17	0.91

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)	570	1352	137	52	1237	217	217	202	96	345	164	572
Future Volume (vph)	570	1352	137	52	1237	217	217	202	96	345	164	572
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		0.41	1.00	1.00
Satd. Flow (perm)	3303	5085	1367	335	4862		3467	3309		725	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)	570	1352	137	52	1237	217	217	202	96	345	164	572
RTOR Reduction (vph)	0	0	64	0	18	0	0	45	0	0	0	242
Lane Group Flow (vph)	570	1352	73	52	1436	0	217	253	0	345	164	330
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)	24.5	63.6	63.6	50.9	45.0		10.0	24.5		44.5	30.5	30.5
Effective Green, g (s)	24.5	63.6	63.6	50.9	45.0		10.0	24.5		44.5	30.5	30.5
Actuated g/C Ratio	0.19	0.49	0.49	0.39	0.35		0.08	0.19		0.34	0.23	0.23
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)	622	2487	668	193	1683		266	623		366	838	357
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						c0.21		0.22
v/c Ratio	0.92	0.54	0.11	0.27	0.85		0.82	0.41		0.94	0.20	0.92
Uniform Delay, d1	51.7	23.1	17.9	24.8	39.4		59.1	46.3		38.5	39.9	48.6
Progression Factor	1.37	0.75	0.98	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	8.5	0.3	0.1	0.8	5.7		17.3	0.4		32.4	0.1	29.1
Delay (s)	79.5	17.8	17.7	25.6	45.1		76.4	46.8		70.9	40.0	77.7
Level of Service	E	B	B	C	D		E	D		E	D	E
Approach Delay (s)		34.8			44.5			59.2			69.8	
Approach LOS		C			D			E			E	

Intersection Summary

HCM 2000 Control Delay	47.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	90.0%	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	885	12	1071
v/c Ratio	0.64	0.16	0.05	0.31	0.38	0.02	0.53
Control Delay	30.5	34.0	15.8	8.0	9.2	6.2	14.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.5	34.0	15.8	8.0	9.2	6.2	14.4
Queue Length 50th (m)	16.5	4.7	0.2	6.5	39.8	0.7	71.1
Queue Length 95th (m)	30.8	12.1	5.9	14.2	79.1	2.9	101.1
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	336	2338	489	2017
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	0.53

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	858	27	12	924	147
Future Volume (vph)	149	1	128	27	1	15	103	858	27	12	924	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	3377	
Flt Permitted		0.81		0.35	1.00		0.20	1.00		0.31	1.00	
Satd. Flow (perm)		2691		534	1633		345	3426		596	3377	
Peak-hour factor, PHF	1.00	1.00	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	858	27	12	924	147
RTOR Reduction (vph)	0	113	0	0	12	0	0	1	0	0	9	0
Lane Group Flow (vph)	0	165	0	27	4	0	103	884	0	12	1062	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		326	2231		378	2021	
v/s Ratio Prot				c0.01	0.00		c0.02	0.26		0.00	c0.31	
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	12.7	
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		7.6	9.4		8.3	13.7	
Level of Service		D		D	D		A	A		A	B	
Approach Delay (s)		46.9			36.6			9.2			13.6	
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	934	1146
v/c Ratio	0.59	0.00	0.37	0.00	0.24	0.36	0.51
Control Delay	47.1	35.0	11.1	0.0	5.1	5.4	11.2
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	5.1	5.4	11.2
Queue Length 50th (m)	28.1	0.2	0.0	0.0	2.9	23.8	52.8
Queue Length 95th (m)	48.4	1.6	12.3	0.0	11.3	58.3	107.7
Internal Link Dist (m)		62.1		66.5		199.1	252.7
Turn Bay Length (m)	25.0				70.0		
Base Capacity (vph)	261	480	386	528	398	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	0.22	0.36	0.51

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	933	1	0	991	155
Future Volume (vph)	154	1	93	0	0	1	89	933	1	0	991	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			3466	
Flt Permitted	0.70	1.00	1.00		1.00		0.18	1.00			1.00	
Satd. Flow (perm)	1307	1900	1233		1615		341	3471			3466	
Peak-hour factor, PHF	1.00	1.00	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	933	1	0	991	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	934	0	0	1138	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		326	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		0.27	0.38			0.54	
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		7.0	6.4			12.6	
Level of Service	D	C	C		D		A	A			B	
Approach Delay (s)		37.7			48.5			6.5			12.6	
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	0.56		
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	970	87	1128
v/c Ratio	0.26	0.07	0.17	0.19	0.11	0.21	0.54	0.31	0.62
Control Delay	34.0	42.1	3.3	33.1	21.8	9.8	20.7	11.2	22.3
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	9.8	20.7	11.2	22.3
Queue Length 50th (m)	18.8	4.8	0.0	12.8	1.9	5.5	81.2	7.6	100.0
Queue Length 95th (m)	33.6	12.6	4.2	24.9	11.2	10.8	100.7	14.2	122.5
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	298	1793	284	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	0.26	0.07	0.17	0.19	0.11	0.21	0.54	0.31	0.62

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	920	50	87	1014	114
Future Volume (vph)	101	23	62	70	9	23	64	920	50	87	1014	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	3487	
Flt Permitted	0.70	1.00	1.00	0.74	1.00		0.16	1.00		0.21	1.00	
Satd. Flow (perm)	1332	1900	1593	1342	1671		305	3465		329	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)	101	23	62	70	9	23	64	920	50	87	1014	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	967	0	87	1121	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		292	1790		279	1801	
v/s Ratio Prot	c0.02	0.01		0.01	0.01		0.02	0.28		c0.02	c0.32	
v/s Ratio Perm	c0.05		0.01	0.03			0.11			0.16		
v/c Ratio	0.27	0.07	0.04	0.21	0.05		0.22	0.54		0.31	0.62	
Uniform Delay, d1	35.8	41.3	41.1	36.8	42.0		12.8	19.4		12.1	20.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.8	0.4	0.3	1.4	0.3		1.7	1.2		2.9	1.6	
Delay (s)	37.6	41.7	41.4	38.2	42.3		14.5	20.6		15.0	22.3	
Level of Service	D	D	D	D	D		B	C		B	C	
Approach Delay (s)		39.4			39.5			20.2			21.8	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM 2000 Control Delay	23.1	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	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	78	30	1047	19	8	979
Future Volume (Veh/h)	78	30	1047	19	8	979
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)	78	30	1047	19	8	979
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	0.82	0.82			0.82	
vC, conflicting volume	1565	537			1069	
vC1, stage 1 conf vol	1060					
vC2, stage 2 conf vol	506					
vCu, unblocked vol	1247	0			641	
tC, single (s)	6.9	6.9			4.1	
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3			2.2	
p0 queue free %	77	97			99	
cM capacity (veh/h)	339	890			778	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	108	698	368	8	490	490
Volume Left	78	0	0	8	0	0
Volume Right	30	0	19	0	0	0
cSH	409	1700	1700	778	1700	1700
Volume to Capacity	0.26	0.41	0.22	0.01	0.29	0.29
Queue Length 95th (m)	8.4	0.0	0.0	0.2	0.0	0.0
Control Delay (s)	16.9	0.0	0.0	9.7	0.0	0.0
Lane LOS	C			A		
Approach Delay (s)	16.9	0.0		0.1		
Approach LOS	C					

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	42.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	45	126	39	1035	880	15
Future Volume (Veh/h)	45	126	39	1035	880	15
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)	45	126	39	1035	880	15
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	1484	448	896			
vC1, stage 1 conf vol	888					
vC2, stage 2 conf vol	596					
vCu, unblocked vol	1382	277	755			
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 %	86	81	95			
cM capacity (veh/h)	328	680	810			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	45	126	39	518	518	587	308
Volume Left	45	0	39	0	0	0	0
Volume Right	0	126	0	0	0	0	15
cSH	328	680	810	1700	1700	1700	1700
Volume to Capacity	0.14	0.19	0.05	0.30	0.30	0.35	0.18
Queue Length 95th (m)	3.8	5.4	1.2	0.0	0.0	0.0	0.0
Control Delay (s)	17.7	11.5	9.7	0.0	0.0	0.0	0.0
Lane LOS	C	B	A				
Approach Delay (s)	13.1		0.4			0.0	
Approach LOS	B						

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	41.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	40	26	10	1004	823	17
Future Volume (Veh/h)	40	26	10	1004	823	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)	40	26	10	1004	823	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	0.92	0.92	0.92			
vC, conflicting volume	1356	422	842			
vC1, stage 1 conf vol	834					
vC2, stage 2 conf vol	522					
vCu, unblocked vol	1214	201	657			
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	97	99			
cM capacity (veh/h)	373	747	865			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	66	10	502	502	549	291
Volume Left	40	10	0	0	0	0
Volume Right	26	0	0	0	0	17
cSH	464	865	1700	1700	1700	1700
Volume to Capacity	0.14	0.01	0.30	0.30	0.32	0.17
Queue Length 95th (m)	3.9	0.3	0.0	0.0	0.0	0.0
Control Delay (s)	14.0	9.2	0.0	0.0	0.0	0.0
Lane LOS	B	A				
Approach Delay (s)	14.0	0.1			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	38.2%	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)	208	819	195	284	560	217	322	716	167	353	228
v/c Ratio	0.71	0.79	0.36	0.89	0.52	0.38	0.66	0.64	0.58	0.41	0.44
Control Delay	33.8	44.7	12.9	55.7	37.0	15.0	29.4	34.7	30.5	40.2	7.9
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	33.8	44.7	12.9	55.7	37.0	15.0	29.4	34.7	30.5	40.2	7.9
Queue Length 50th (m)	31.1	97.8	10.7	46.7	61.3	15.0	52.7	73.5	24.6	39.6	0.0
Queue Length 95th (m)	50.0	122.6	30.7	#97.3	79.8	36.9	77.7	95.1	39.8	55.1	21.4
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)	311	1051	542	325	1073	571	509	1124	291	864	513
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	0.67	0.78	0.36	0.87	0.52	0.38	0.63	0.64	0.57	0.41	0.44

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	195	284	560	217	322	500	216	167	353	228
Future Volume (vph)	208	819	195	284	560	217	322	500	216	167	353	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	3389		1770	3539	1396
Flt Permitted	0.32	1.00	1.00	0.15	1.00	1.00	0.40	1.00		0.29	1.00	1.00
Satd. Flow (perm)	416	3471	1476	275	3574	1583	738	3389		548	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	195	284	560	217	322	500	216	167	353	228
RTOR Reduction (vph)	0	0	95	0	0	95	0	40	0	0	0	172
Lane Group Flow (vph)	208	819	100	284	560	122	322	676	0	167	353	56
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)	51.1	35.6	35.6	51.3	35.7	35.7	51.7	38.0		38.8	29.1	29.1
Effective Green, g (s)	51.1	35.6	35.6	51.3	35.7	35.7	51.7	38.0		38.8	29.1	29.1
Actuated g/C Ratio	0.43	0.30	0.30	0.43	0.30	0.30	0.43	0.32		0.33	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)	287	1039	441	314	1073	475	476	1083		278	866	341
v/s Ratio Prot	0.09	0.24		c0.12	0.16		c0.11	0.20		0.05	0.10	
v/s Ratio Perm	0.22		0.07	c0.27		0.08	c0.19			0.15		0.04
v/c Ratio	0.72	0.79	0.23	0.90	0.52	0.26	0.68	0.62		0.60	0.41	0.16
Uniform Delay, d1	23.9	38.2	31.3	26.8	34.5	31.5	23.8	34.4		30.0	37.7	35.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	8.8	4.0	0.3	27.7	0.5	0.3	3.8	2.7		3.6	1.4	1.0
Delay (s)	32.6	42.2	31.6	54.5	35.0	31.8	27.5	37.1		33.7	39.1	36.4
Level of Service	C	D	C	D	C	C	C	D		C	D	D
Approach Delay (s)		38.9			39.6			34.1			37.0	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	37.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	118.9	Sum of lost time (s)	20.0
Intersection Capacity Utilization	99.4%	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)	109	1342	209	1362	99	415	48	48
v/c Ratio	0.35	0.44	0.57	0.41	0.46	0.72	0.28	0.15
Control Delay	9.0	15.7	34.0	1.9	51.7	22.4	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	22.4	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	48.4	8.2	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)	356	3019	475	3342	217	901	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	313	48	23	25
Future Volume (vph)	109	1229	113	209	1349	13	99	102	313	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	3145		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	3145		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	313	48	23	25
RTOR Reduction (vph)	0	6	0	0	0	0	0	283	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		4.65	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	18.0	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	73.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	5	679	4	106	644	47	58	367	176	340	345	95
v/c Ratio	0.02	0.50	0.01	0.52	0.47	0.07	0.11	0.20	0.20	0.67	0.19	0.11
Control Delay	23.6	29.8	0.0	39.4	29.3	7.0	15.7	16.0	7.1	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	23.6	29.8	0.0	39.4	29.3	7.0	15.7	16.0	7.1	29.7	15.9	3.2
Queue Length 50th (m)	0.8	66.8	0.0	20.0	62.6	0.0	7.1	24.8	8.7	60.3	23.2	0.0
Queue Length 95th (m)	3.6	85.3	0.0	40.6	80.4	8.0	14.9	34.3	20.9	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)	220	1356	623	205	1356	635	519	1828	868	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	0.02	0.50	0.01	0.52	0.47	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	679	4	106	644	47	58	367	176	340	345	95
Future Volume (vph)	5	679	4	106	644	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	0.31	1.00	1.00	0.29	1.00	1.00	0.54	1.00	1.00	0.52	1.00	1.00
Satd. Flow (perm)	574	3539	1583	536	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	679	4	106	644	47	58	367	176	340	345	95
RTOR Reduction (vph)	0	0	2	0	0	29	0	0	50	0	0	46
Lane Group Flow (vph)	5	679	2	106	644	18	58	367	126	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)	220	1356	606	205	1356	606	519	1828	817	505	1828	817
v/s Ratio Prot		0.19			0.18			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	0.02	0.50	0.00	0.52	0.47	0.03	0.11	0.20	0.15	0.67	0.19	0.06
Uniform Delay, d1	23.0	28.2	22.8	28.5	27.9	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	1.3	0.0	9.0	1.2	0.1	0.4	0.2	0.4	7.0	0.2	0.1
Delay (s)	23.2	29.6	22.8	37.5	29.1	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)		29.5			29.9			15.8			21.2	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	24.4	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	73.6%	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)	55.2	102.8	110.5	91.0	80.6	31.2	36.1	12.7	62.2	67.4	57.0	73.0
Average Queue (m)	12.8	59.8	65.1	54.7	46.4	3.4	3.7	1.4	33.9	40.3	17.7	26.5
95th Queue (m)	38.3	98.9	104.9	91.7	75.9	21.4	23.0	15.3	54.4	59.7	41.9	52.1
Link Distance (m)		86.8	86.8	86.8	86.8	65.4	65.4	65.4			114.0	114.0
Upstream Blk Time (%)		4	5	1	0	0	0	0				
Queuing Penalty (veh)		17	18	4	1	0	1	0				
Storage Bay Dist (m)	70.0								65.0	65.0		
Storage Blk Time (%)		8							0	1	0	
Queuing Penalty (veh)		4							2	7	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)	77.8	34.8	45.4	90.7	47.4	157.4	68.8
Average Queue (m)	34.6	11.3	17.9	70.9	45.2	80.9	9.4
95th Queue (m)	63.1	24.9	36.1	105.2	52.5	178.9	38.8
Link Distance (m)	114.0		86.1	86.1		180.4	180.4
Upstream Blk Time (%)				20		10	
Queuing Penalty (veh)				0		0	
Storage Bay Dist (m)		20.0			40.0		
Storage Blk Time (%)		2	14		57	0	
Queuing Penalty (veh)		2	8		5	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)	121.5	120.4	116.0	109.9	84.9	124.5	92.8	64.8	69.6	307.5	354.2	342.3
Average Queue (m)	74.0	80.5	63.7	56.9	11.0	62.2	44.0	38.2	48.4	260.7	287.0	152.8
95th Queue (m)	124.7	126.2	113.0	96.6	44.4	117.7	85.4	55.2	64.1	364.5	400.1	366.6
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	1	0	0			0				30	9
Queuing Penalty (veh)	9	8	2	1			2				0	0
Storage Bay Dist (m)					45.0	135.0				300.0		
Storage Blk Time (%)				14		1				6	37	11
Queuing Penalty (veh)				25		6				21	118	14

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

Movement	SB	B36	B36
Directions Served	R	T	T
Maximum Queue (m)	281.0	127.8	114.8
Average Queue (m)	106.8	38.6	33.0
95th Queue (m)	297.0	140.6	130.1
Link Distance (m)		176.9	176.9
Upstream Blk Time (%)		7	6
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)	107.7	114.5	144.3	114.8	109.8	123.7	94.5	120.7	138.7	84.4	81.2	104.1
Average Queue (m)	55.6	57.8	45.3	35.5	41.4	73.1	46.4	51.9	97.0	47.9	47.5	65.3
95th Queue (m)	95.8	100.3	106.4	87.7	88.5	119.1	88.5	101.8	142.8	74.5	72.7	93.7
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	0			0	0	0				
Queuing Penalty (veh)		0	0			0	0	0				
Storage Bay Dist (m)	130.0								130.0	265.0		
Storage Blk Time (%)	0	0							3			
Queuing Penalty (veh)	0	1							20			

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

Movement	NB
Directions Served	R
Maximum Queue (m)	93.3
Average Queue (m)	50.2
95th Queue (m)	82.9
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)	101.5	103.0	148.6	144.4	152.1	53.4	51.3	129.5	133.5	144.1	163.6	57.4
Average Queue (m)	65.0	69.2	82.8	72.4	81.1	5.3	17.2	66.9	96.2	117.1	76.9	55.0
95th Queue (m)	97.4	101.3	136.4	130.8	139.3	33.7	43.5	118.1	143.9	150.7	190.3	66.3
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)					0			0	0	5	9	
Queuing Penalty (veh)					0			2	2	25	46	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)			0		1		0	18				9
Queuing Penalty (veh)			1		0		0	12				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)	144.2	135.1	67.3	100.6	100.6
Average Queue (m)	128.6	57.4	47.1	56.9	100.3
95th Queue (m)	155.3	149.0	73.2	130.0	105.4
Link Distance (m)	128.7	128.7		96.0	96.0
Upstream Blk Time (%)	50	6		12	91
Queuing Penalty (veh)	0	0		0	0
Storage Bay Dist (m)			60.0		
Storage Blk Time (%)	60		17		
Queuing Penalty (veh)	198		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	93.5	81.3	55.3	52.9	40.0	23.4	249.0	257.6	262.8	65.6	80.8
Average Queue (m)	65.4	69.1	34.8	33.1	34.7	15.2	6.9	146.3	238.7	252.0	27.3	45.3
95th Queue (m)	86.2	93.6	80.8	53.3	52.9	31.1	18.5	291.1	303.7	258.8	61.9	77.9
Link Distance (m)			131.2	131.2	131.2			244.4	244.4	244.4		
Upstream Blk Time (%)			0					3	44	93		
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 (%)	11	20			1	0		0			0	1
Queuing Penalty (veh)	50	88			1	0		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)	70.3	60.4	117.6	219.4	220.9	80.0
Average Queue (m)	30.6	28.3	114.5	160.7	107.1	61.8
95th Queue (m)	55.1	53.3	128.5	286.1	236.0	101.2
Link Distance (m)	218.2	218.2		214.5	214.5	
Upstream Blk Time (%)				17	1	
Queuing Penalty (veh)				94	6	
Storage Bay Dist (m)			110.0			45.0
Storage Blk Time (%)			68	4	1	31
Queuing Penalty (veh)			56	12	3	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)	59.5	57.2	31.0	13.0	54.9	85.1	85.2	46.7	165.9	187.8
Average Queue (m)	29.9	19.6	9.6	3.2	18.6	33.0	35.2	6.6	65.2	87.7
95th Queue (m)	51.9	51.4	26.1	10.8	39.0	71.4	74.9	32.8	149.7	173.3
Link Distance (m)	126.0	126.0	60.2	60.2		214.5	214.5		195.2	195.2
Upstream Blk Time (%)		0							2	2
Queuing Penalty (veh)		0							9	13
Storage Bay Dist (m)					70.0			50.0		
Storage Blk Time (%)						1		0	20	
Queuing Penalty (veh)						1		0	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	26.1	46.6	5.1	29.0	61.4	61.4	146.1	162.9
Average Queue (m)	25.3	1.0	18.5	0.3	10.8	18.9	20.2	41.2	61.9
95th Queue (m)	39.9	12.0	37.6	2.8	22.7	46.2	47.4	102.8	126.0
Link Distance (m)		71.5	71.5	75.9		195.2	195.2	247.7	247.7
Upstream Blk Time (%)			0						
Queuing Penalty (veh)			0						
Storage Bay Dist (m)	25.0				70.0				
Storage Blk Time (%)	15					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)	43.8	25.8	22.1	34.0	19.2	37.6	88.2	89.7	46.4	107.8	109.3
Average Queue (m)	16.6	5.7	8.1	14.1	6.0	8.6	53.9	56.0	15.2	50.9	65.5
95th Queue (m)	32.9	16.4	17.7	28.8	15.1	22.6	83.0	84.9	32.6	84.0	99.1
Link Distance (m)		140.4			212.1		247.7	247.7		206.7	206.7
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (m)	50.0		50.0	30.0		70.0			65.0		
Storage Blk Time (%)	0			2	0		2		0	1	
Queuing Penalty (veh)	0			1	0		1		0	1	

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

Movement	WB	NB	NB	SB	SB
Directions Served	LR	T	TR	L	T
Maximum Queue (m)	56.5	3.3	1.3	7.3	1.7
Average Queue (m)	21.0	0.1	0.0	0.9	0.1
95th Queue (m)	44.7	2.3	0.9	5.4	1.4
Link Distance (m)	182.2	206.7	206.7		208.0
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)				15.0	
Storage Blk Time (%)				0	
Queuing Penalty (veh)				0	

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

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	TR
Maximum Queue (m)	24.4	25.8	16.9	2.0	5.5	11.0
Average Queue (m)	9.4	12.7	4.9	0.1	0.2	0.5
95th Queue (m)	19.7	21.5	13.4	1.4	3.9	6.1
Link Distance (m)	102.1	102.1		208.0	137.8	137.8
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			15.0			
Storage Blk Time (%)			0			
Queuing Penalty (veh)			3			

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

Movement	EB	NB	NB	NB
Directions Served	LR	L	T	T
Maximum Queue (m)	31.7	11.8	74.2	45.4
Average Queue (m)	13.3	1.1	6.3	2.7
95th Queue (m)	25.2	6.6	35.3	20.8
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	151.7	149.4	75.0	93.3	194.1	169.6	73.6	92.1	102.8	93.6	77.8
Average Queue (m)	54.3	84.1	82.1	33.8	73.7	111.0	95.6	20.4	56.9	62.0	50.8	35.6
95th Queue (m)	88.9	149.1	144.9	79.5	114.1	217.9	193.5	49.2	92.4	99.6	93.7	63.9
Link Distance (m)		835.5	835.5			287.9	287.9			92.4	92.4	
Upstream Blk Time (%)						0			1	2	1	
Queuing Penalty (veh)						0			0	12	6	
Storage Bay Dist (m)	25.0			25.0	40.0			25.0	100.0			40.0
Storage Blk Time (%)	42	51	56	2	61	18	36	1	1	2		18
Queuing Penalty (veh)	170	107	108	10	171	52	79	2	1	8		32

Intersection: 33: Bayview Drive & Big Bay Point Road

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (m)	75.1	57.6	51.1
Average Queue (m)	35.6	31.1	22.9
95th Queue (m)	58.2	51.0	42.3
Link Distance (m)	101.3	101.3	
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (m)			50.0
Storage Blk Time (%)	6	1	0
Queuing Penalty (veh)	10	3	1

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)	56.9	73.9	92.2	96.7	54.8	41.1	19.9	19.1	36.3	39.7	74.3	28.3
Average Queue (m)	16.0	43.2	53.5	46.4	30.8	7.0	7.6	4.5	18.2	19.1	36.0	11.1
95th Queue (m)	35.7	71.3	82.3	78.5	51.4	22.0	17.5	13.9	32.5	34.0	65.3	24.2
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	2			2				0	0		
Queuing Penalty (veh)	1	2			10				0	0		

Intersection: 39: Bryne Drive & Mapleview Drive W

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (m)	19.2	14.1
Average Queue (m)	4.9	4.1
95th Queue (m)	13.9	11.3
Link Distance (m)	172.2	172.2
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 42: Bend

Movement	SB
Directions Served	T
Maximum Queue (m)	27.7
Average Queue (m)	0.9
95th Queue (m)	19.5
Link Distance (m)	97.4
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
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)	9.1	93.5	84.9	9.9	64.4	67.5	66.3	18.4	24.3	49.0	36.9	28.4
Average Queue (m)	0.9	56.9	48.1	0.6	31.4	34.1	38.1	4.4	11.0	29.1	15.1	12.2
95th Queue (m)	5.3	82.3	74.7	4.6	58.4	58.3	61.2	12.9	21.7	43.7	31.6	23.9
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 (%)		7	2		1	0	1					
Queuing Penalty (veh)		0	0		5	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)	79.6	145.5	125.1	26.4
Average Queue (m)	62.7	66.6	43.7	8.7
95th Queue (m)	91.6	157.0	120.5	20.1
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 (%)	34	0	0	
Queuing Penalty (veh)	58	0	0	

Network Summary

Network wide Queuing Penalty: 1842

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	417	1806	67	69	1700	256	659	90	227	50	492
v/c Ratio	0.89	0.84	0.09	0.43	0.98	0.39	0.89	0.23	0.89	0.19	0.86
Control Delay	83.4	17.4	0.3	24.9	40.7	4.1	65.1	36.7	89.5	51.1	51.8
Queue Delay	0.0	0.0	0.0	0.0	13.2	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	83.4	17.4	0.3	24.9	53.9	4.1	65.1	36.7	89.5	51.1	51.9
Queue Length 50th (m)	54.3	144.0	0.3	6.2	120.4	2.9	88.6	16.8	60.9	12.1	109.7
Queue Length 95th (m)	m#87.8	161.6	m0.0	m7.4	#196.8	m4.9	#117.3	32.4	#107.9	24.8	#175.3
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)	467	2160	751	163	1727	650	773	409	260	274	569
Starvation Cap Reductn	0	0	0	0	82	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	45	0	0	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.84	0.09	0.42	1.03	0.39	0.85	0.22	0.87	0.18	0.87

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)	417	1806	67	69	1700	256	659	65	25	227	50	492
Future Volume (vph)	417	1806	67	69	1700	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	0.09	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	4940	1578	169	5036	1529	3467	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	1806	67	69	1700	256	659	65	25	227	50	492
RTOR Reduction (vph)	0	0	38	0	0	125	0	11	0	0	0	55
Lane Group Flow (vph)	417	1806	29	69	1700	131	659	79	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)	17.4	56.1	56.1	50.5	44.6	44.6	27.7	27.7		18.3	18.3	35.7
Effective Green, g (s)	17.4	56.1	56.1	50.5	44.6	44.6	27.7	27.7		18.3	18.3	35.7
Actuated g/C Ratio	0.13	0.43	0.43	0.39	0.34	0.34	0.21	0.21		0.14	0.14	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)	468	2131	680	139	1727	524	738	380		254	267	443
v/s Ratio Prot	0.12	0.37		0.02	c0.34		c0.19	0.04		0.13	0.03	c0.13
v/s Ratio Perm			0.02	0.17		0.09						0.14
v/c Ratio	0.89	0.85	0.04	0.50	0.98	0.25	0.89	0.21		0.89	0.19	0.99
Uniform Delay, d1	55.4	33.1	21.4	28.3	42.4	30.7	49.7	42.1		54.9	49.3	46.9
Progression Factor	1.19	0.41	0.11	1.18	0.66	0.37	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	17.7	3.4	0.1	1.3	11.8	0.5	13.2	0.3		30.1	0.3	38.8
Delay (s)	83.7	17.1	2.4	34.7	39.9	11.7	62.9	42.4		85.0	49.6	85.7
Level of Service	F	B	A	C	D	B	E	D		F	D	F
Approach Delay (s)		28.8			36.2			60.4			83.1	
Approach LOS		C			D			E			F	

Intersection Summary

HCM 2000 Control Delay	42.6	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	95.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Queuing and Blocking Report
2031 Future Background - PM Peak Hour (Mitigation)

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)	147.1	156.7	167.0	141.2	149.0	9.4	57.2	129.7	131.1	141.8	162.2	57.4
Average Queue (m)	96.7	102.0	77.4	49.1	56.4	2.8	14.1	57.6	83.5	107.8	66.5	54.6
95th Queue (m)	179.3	187.9	176.0	107.3	109.0	9.1	37.4	107.7	144.2	160.7	176.4	67.8
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)			3	0	0			0	0	5	8	
Queuing Penalty (veh)			22	3	1			1	1	24	39	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)	7	10	0					12				17
Queuing Penalty (veh)	43	58	0					8				56

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)	140.1	133.7	67.3	100.6	100.6
Average Queue (m)	132.9	87.0	56.0	57.2	96.3
95th Queue (m)	142.7	177.3	78.5	128.2	117.2
Link Distance (m)	128.7	128.7		96.0	96.0
Upstream Blk Time (%)	77	22		19	64
Queuing Penalty (veh)	0	0		0	0
Storage Bay Dist (m)			60.0		
Storage Blk Time (%)	71		35		
Queuing Penalty (veh)	234		17		

Zone Summary

Zone wide Queuing Penalty: 508

HCM Signalized Intersection Capacity Analysis
1: West Terminal

05-17-2022

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					0.64			1.00				
Incremental Delay, d2					2.4			2.8				
Delay (s)					23.0			33.0				
Level of Service					C			C				
Approach Delay (s)		0.0			23.0			33.0			0.0	
Approach LOS		A			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	28.2	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

05-17-2022

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

05-17-2022

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	1823	0
Future Volume (vph)	0	2042	0	0	0	0	0	0	0	0	1823	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	1823	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	1823	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									c0.35	
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									33.2	
Level of Service		C									C	
Approach Delay (s)		25.0			0.0			0.0			33.2	
Approach LOS		C			A			A			C	

Intersection Summary				
HCM 2000 Control Delay	28.8	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	84.7%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
4: West Terminal/E-S

05-17-2022

Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Traffic Volume (veh/h)	0	0	442	1852	0	0
Future Volume (Veh/h)	0	0	442	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	442	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		1501	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		151	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		416	1091

Direction, Lane #	WB 1	WB 2	WB 3
Volume Total	812	741	741
Volume Left	442	0	0
Volume Right	0	0	0
cSH	1607	1700	1700
Volume to Capacity	0.28	0.44	0.44
Queue Length 95th (m)	8.6	0.0	0.0
Control Delay (s)	5.7	0.0	0.0
Lane LOS	A		
Approach Delay (s)	2.0		
Approach LOS			

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: W-S

05-17-2022

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

05-17-2022

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

05-17-2022

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (veh/h)	0	0	1823	1027	0	0
Future Volume (Veh/h)	0	0	1823	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	1823	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	2850				1823	608
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2850				1823	608
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)	135				70	444

Direction, Lane #	WB 1	WB 2	WB 3	WB 4
Volume Total	608	608	608	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	84.7%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
14: S-E

05-17-2022

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2042	0	0	0	0	551
Future Volume (vph)	2042	0	0	0	0	551
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	551
RTOR Reduction (vph)	0	0	0	0	0	2
Lane Group Flow (vph)	2042	0	0	0	0	549
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					0.45
Uniform Delay, d1	30.6					25.6
Progression Factor	0.00					1.00
Incremental Delay, d2	2.1					1.2
Delay (s)	2.1					26.8
Level of Service	A					C
Approach Delay (s)	2.1			0.0	26.8	
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	84.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
16: W-N/East Terminal

05-17-2022

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

05-17-2022

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1823	471	0
Future Volume (vph)	0	0	0	1823	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	1823	471	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	1823	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				c0.35	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	69.6%	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)	47.9	52.6	50.8	31.0	39.2	39.5
Average Queue (m)	41.8	46.1	44.9	29.7	29.3	29.7
95th Queue (m)	50.9	49.2	49.6	31.5	35.6	35.2
Link Distance (m)	18.6	18.6	18.6	25.6	25.6	25.6
Upstream Blk Time (%)	46	57	56	56	38	47
Queuing Penalty (veh)	283	354	345	379	256	318
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	28.5	27.8	66.0	58.7
Average Queue (m)	21.8	7.6	11.5	54.1	41.0
95th Queue (m)	33.5	22.2	25.6	68.1	54.7
Link Distance (m)	22.8	22.8	22.8	37.0	37.0
Upstream Blk Time (%)	5	3	6	27	12
Queuing Penalty (veh)	33	17	41	87	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)	68.1	63.4	62.7	46.8	39.0	44.0
Average Queue (m)	58.8	56.8	54.8	36.7	36.5	35.9
95th Queue (m)	64.8	62.9	65.5	41.5	38.4	44.8
Link Distance (m)	27.3	27.3	27.3	19.8	19.8	19.8
Upstream Blk Time (%)	40	45	48	63	55	40
Queuing Penalty (veh)	275	307	327	383	336	246
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	73.4	75.8
Average Queue (m)	57.6	53.9	48.5
95th Queue (m)	81.2	81.1	83.3
Link Distance (m)	59.5	59.5	59.5
Upstream Blk Time (%)	23	16	14
Queuing Penalty (veh)	179	123	109
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	191.1	183.7	185.0
Average Queue (m)	182.6	181.8	162.7	71.0
95th Queue (m)	187.6	186.6	203.5	213.4
Link Distance (m)	176.8	176.8	176.8	176.8
Upstream Blk Time (%)	85	65	10	5
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)	11.3	20.5	23.1	57.0	36.7
Average Queue (m)	2.0	10.5	11.1	29.3	16.6
95th Queue (m)	8.3	20.3	21.8	49.8	37.1
Link Distance (m)	7.7	7.7	7.7	37.4	37.4
Upstream Blk Time (%)	10	43	43	3	0
Queuing Penalty (veh)	61	267	267	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)	194.3	192.4	180.2	123.4
Average Queue (m)	163.7	148.3	99.1	18.2
95th Queue (m)	215.1	204.3	178.6	110.3
Link Distance (m)	187.5	187.5	187.5	187.5
Upstream Blk Time (%)	11	4	2	1
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)	10.3	10.9	18.2	70.4	51.6
Average Queue (m)	0.7	2.4	8.9	51.6	39.2
95th Queue (m)	4.9	8.4	17.0	70.8	57.3
Link Distance (m)	20.9	20.9	20.9	48.7	48.7
Upstream Blk Time (%)	0		0	10	1
Queuing Penalty (veh)	0		1	27	3
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)	69.4	75.2	74.0
Average Queue (m)	47.2	34.3	28.3
95th Queue (m)	73.5	69.9	69.0
Link Distance (m)	54.6	54.6	54.6
Upstream Blk Time (%)	4	2	2
Queuing Penalty (veh)	39	14	17
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)	36.2	39.4	39.6	65.0	56.7
Average Queue (m)	20.4	20.9	17.0	54.6	39.5
95th Queue (m)	35.7	41.0	39.9	71.1	58.8
Link Distance (m)	31.8	31.8	31.8	39.6	39.6
Upstream Blk Time (%)	1	2	2	45	15
Queuing Penalty (veh)	7	10	9	105	34
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 5304

Appendix F

2031 Total 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

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.

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

Queues
2031 Future Total - AM Peak Hour - DDI

1: West Terminal-E-S

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

HCM Signalized Intersection Capacity Analysis
2031 Future Total - AM Peak Hour - DDI

1: West Terminal-E-S

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

Queues
210434

15: Bayview Drive & Mapleview Drive W
2031 Future Total - PM Peak Hour

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.

HCM Signalized Intersection Capacity Analysis
210434

15: Bayview Drive & Mapleview Drive W
2031 Future Total - PM Peak Hour

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.

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

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			

Queuing and Blocking Report
2031 Future Total - PM Peak Hour - DDI

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)						

Queuing and Blocking Report
2031 Future Total - PM Peak Hour - DDI

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

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	58.8	6.6	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	58.8	6.7	31.4	47.8	13.6	54.3	29.6
Queue Length 50th (m)	0.4	7.7	44.3	51.5	0.9	0.9	0.0	53.7	2.7
Queue Length 95th (m)	m0.7	9.3	m59.0	65.8	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		1.22	0.36		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		56.7	7.9		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			15.5			46.2			44.1	
Approach LOS		A			B			D			D	

Intersection Summary

HCM 2000 Control Delay	15.5	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	429	1725	675	723
v/c Ratio	0.74	0.33	0.95	0.58	0.69	0.86
Control Delay	21.9	3.6	48.7	11.2	38.4	44.2
Queue Delay	0.0	0.0	0.0	0.3	0.0	0.0
Total Delay	21.9	3.6	48.7	11.5	38.4	44.2
Queue Length 50th (m)	95.9	4.9	71.7	104.1	67.6	77.7
Queue Length 95th (m)	76.3	m4.7	#140.4	133.8	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)	2029	593	478	2966	1071	916
Starvation Cap Reductn	0	0	0	566	0	0
Spillback Cap Reductn	0	0	0	50	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.33	0.90	0.72	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	429	1725	0	0	0	0	675	0	723
Future Volume (vph)	0	1496	198	429	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	172	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	429	1725	0	0	0	0	675	0	723
RTOR Reduction (vph)	0	0	92	0	0	0	0	0	0	0	0	49
Lane Group Flow (vph)	0	1496	106	429	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)		35.9	35.9	66.1	66.1					31.9		31.9
Effective Green, g (s)		35.9	35.9	66.1	66.1					31.9		31.9
Actuated g/C Ratio		0.33	0.33	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)		2031	501	449	2968					976		792
v/s Ratio Prot		0.24		c0.23	0.35					0.20		
v/s Ratio Perm			0.07	c0.35								c0.25
v/c Ratio		0.74	0.21	0.96	0.58					0.69		0.85
Uniform Delay, d1		32.9	26.8	31.7	13.5					34.7		36.8
Progression Factor		0.57	0.21	0.70	0.75					1.00		1.00
Incremental Delay, d2		2.2	0.8	26.2	0.6					2.1		8.7
Delay (s)		21.0	6.5	48.4	10.7					36.8		45.5
Level of Service		C	A	D	B					D		D
Approach Delay (s)		19.3			18.2			0.0			41.3	
Approach LOS		B			B			A			D	

Intersection Summary

HCM 2000 Control Delay	24.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
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	1691	761	464	229
v/c Ratio	0.69	0.53	0.66	0.69	0.74	0.42
Control Delay	39.5	6.9	10.8	7.8	49.0	28.3
Queue Delay	0.0	0.3	0.0	1.1	0.0	0.0
Total Delay	39.5	7.2	10.8	9.0	49.0	28.3
Queue Length 50th (m)	23.6	0.0	31.3	17.4	51.4	17.8
Queue Length 95th (m)	m37.2	125.6	m44.0	m33.3	65.0	29.0
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	507	3514	2546	1102	825	703
Starvation Cap Reductn	0	864	0	151	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.70	0.66	0.80	0.56	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)	314	1856	0	0	1691	761	464	0	229	0	0	0
Future Volume (vph)	314	1856	0	0	1691	761	464	0	229	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	1691	761	464	0	229	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	338	0	0	56	0	0	0
Lane Group Flow (vph)	314	1856	0	0	1691	423	464	0	173	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)	15.5	76.8			57.3	57.3	21.2		21.2			
Effective Green, g (s)	15.5	76.8			57.3	57.3	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)	452	3516			2548	764	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	0.69	0.53			0.66	0.55	0.74		0.35			
Uniform Delay, d1	45.0	7.9			19.3	17.7	41.8		38.4			
Progression Factor	0.75	0.77			0.49	2.44	1.00		1.00			
Incremental Delay, d2	3.2	0.4			0.6	1.2	4.8		0.4			
Delay (s)	36.9	6.5			10.1	44.5	46.6		38.9			
Level of Service	D	A			B	D	D		D			
Approach Delay (s)		10.9			20.8			44.1			0.0	
Approach LOS		B			C			D			A	

Intersection Summary

HCM 2000 Control Delay	19.8	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	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	1554	30	13	2096	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	67.3	3.0	0.1	4.4	24.4	0.1	51.2	23.7	49.7	46.5	16.9
Queue Delay	0.0	0.0	0.0	0.0	40.7	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.3	3.0	0.1	4.4	65.1	0.1	51.2	23.7	49.7	46.5	16.9
Queue Length 50th (m)	39.2	14.6	0.0	0.5	44.9	0.0	20.2	2.5	5.9	2.2	0.0
Queue Length 95th (m)	55.5	23.4	m0.0	m0.6	m#202.5	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	256	2135	721	835	427	139	146	287
Starvation Cap Reductn	0	0	0	0	239	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	1.11	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	1554	30	13	2096	90	180	12	28	27	10	178
Future Volume (vph)	321	1554	30	13	2096	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	291	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	1554	30	13	2096	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	1554	18	13	2096	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	151	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	0.52	0.02	0.09	0.98	0.06	0.50	0.08		0.19	0.07	0.11
Uniform Delay, d1	41.1	12.5	8.7	16.6	30.4	17.7	46.5	44.5		47.5	47.1	47.2
Progression Factor	1.52	0.20	1.00	0.52	0.50	0.01	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.8	0.6	0.0	0.1	7.7	0.1	1.1	0.2		0.7	0.2	0.4
Delay (s)	63.2	3.1	8.7	8.7	22.8	0.2	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)		13.3			21.8			47.1			47.7	
Approach LOS		B			C			D			D	

Intersection Summary

HCM 2000 Control Delay	20.7	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)	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)	401	904	303	62	1754	108	65	368	184	483
v/c Ratio	0.98	0.41	0.37	0.19	0.99	0.55	0.08	0.83	0.21	0.95
Control Delay	97.1	18.0	4.1	14.9	54.6	60.5	13.1	48.8	31.5	55.6
Queue Delay	0.0	0.0	0.0	0.0	38.7	0.0	0.0	0.0	0.0	1.1
Total Delay	97.1	18.0	4.1	14.9	93.3	60.5	13.1	48.8	31.5	56.8
Queue Length 50th (m)	~53.6	31.2	3.7	6.6	142.1	12.4	1.7	62.9	16.6	71.3
Queue Length 95th (m)	#89.4	38.1	21.0	13.6	#180.5	21.8	7.2	#116.1	26.1	#137.6
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)	411	2200	812	323	1770	200	908	441	922	529
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	209	0	0	0	0	7
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.41	0.37	0.19	1.12	0.54	0.07	0.83	0.20	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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	401	904	303	62	1608	146	108	21	44	368	184	483
Future Volume (vph)	401	904	303	62	1608	146	108	21	44	368	184	483
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	3094		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	547	4900		3019	3094		1050	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)	401	904	303	62	1608	146	108	21	44	368	184	483
RTOR Reduction (vph)	0	0	175	0	10	0	0	34	0	0	0	129
Lane Group Flow (vph)	401	904	128	62	1744	0	108	31	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)	14.1	46.5	46.5	44.2	38.3		7.2	24.8		41.6	30.4	30.4
Effective Green, g (s)	14.1	46.5	46.5	44.2	38.3		7.2	24.8		41.6	30.4	30.4
Actuated g/C Ratio	0.13	0.42	0.42	0.40	0.35		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)	411	2108	616	282	1706		197	697		464	898	391
v/s Ratio Prot	c0.12	0.18		0.01	c0.36		0.04	0.01		c0.09	0.06	
v/s Ratio Perm			0.09	0.08						0.21		c0.25
v/c Ratio	0.98	0.43	0.21	0.22	1.02		0.55	0.04		0.79	0.20	0.91
Uniform Delay, d1	47.8	22.4	20.1	20.4	35.9		49.8	33.3		29.3	30.5	38.4
Progression Factor	1.30	0.78	1.15	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	35.2	0.6	0.7	0.4	27.6		3.1	0.0		9.0	0.1	23.8
Delay (s)	97.3	18.1	23.8	20.8	63.5		52.9	33.4		38.3	30.6	62.2
Level of Service	F	B	C	C	E		D	C		D	C	E
Approach Delay (s)		38.9			62.0			45.6			48.1	
Approach LOS		D			E			D			D	

Intersection Summary

HCM 2000 Control Delay	50.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	91.2%	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	508	7	1036
v/c Ratio	0.21	0.11	0.01	0.16	0.20	0.01	0.47
Control Delay	14.7	35.5	0.0	5.0	5.7	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	5.7	4.3	10.8
Queue Length 50th (m)	0.4	2.6	0.0	2.0	11.1	0.3	48.2
Queue Length 95th (m)	7.5	8.3	0.0	7.3	35.6	1.7	86.4
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	735	364	2582	735	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	0.16	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	489	19	7	987	49
Future Volume (vph)	36	0	33	15	0	6	60	489	19	7	987	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		0.47	1.00	
Satd. Flow (perm)		2644		592	1615		359	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	15	0	6	60	489	19	7	987	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	506	0	7	1034	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		328	2358		602	2088	
v/s Ratio Prot				c0.00	0.00		c0.01	0.15		0.00	c0.32	
v/s Ratio Perm		0.00		c0.02			0.13			0.01		
v/c Ratio		0.05		0.15	0.00		0.18	0.21		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	9.9	
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	479	6	1066
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	10.4	0.3	49.5
Queue Length 95th (m)	16.3	0.0	5.5	6.2	33.6	1.5	88.9
Internal Link Dist (m)					199.1		252.7
Turn Bay Length (m)	25.0			70.0		70.0	
Base Capacity (vph)	234	424	160	499	2810	823	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	479	0	6	1013	53
Future Volume (vph)	39	0	25	6	0	0	50	479	0	6	1013	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		0.48	1.00	
Satd. Flow (perm)	1687		961	0			435	3406		909	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	479	0	6	1013	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	479	0	6	1064	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			383	2458		653	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	0.19		0.01	0.47	
Uniform Delay, d1	39.2		44.9	49.3			3.6	4.5		4.3	6.9	
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			3.7	4.7		4.3	7.6	
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	8.2	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	419	77	1052
v/c Ratio	0.16	0.06	0.14	0.34	0.13	0.20	0.12	0.50
Control Delay	37.3	0.3	34.2	1.6	6.3	10.0	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	10.0	5.3	12.2
Queue Length 50th (m)	6.8	0.0	6.1	0.0	1.7	21.4	4.5	68.8
Queue Length 95th (m)	14.0	0.0	15.0	0.0	4.8	32.1	9.6	92.6
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	583	258	691	246	2097	672	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	0.20	0.11	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	418	1	77	1012	40
Future Volume (vph)	33	0	23	36	0	198	30	418	1	77	1012	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	0.48		1.00	0.56	1.00		0.23	1.00		0.49	1.00	
Satd. Flow (perm)	905		1593	1028	1346		247	3404		843	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	198	30	418	1	77	1012	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	419	0	77	1050	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		188	2030		608	2023	
v/s Ratio Prot	c0.01			c0.01	0.02		0.01	0.12		c0.01	c0.32	
v/s Ratio Perm	c0.02		0.00	0.02			0.09			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	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	14	7	576	56	15	943
Future Volume (Veh/h)	14	7	576	56	15	943
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)	14	7	576	56	15	943
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	
vC, conflicting volume	1106	316			632	
vC1, stage 1 conf vol	604					
vC2, stage 2 conf vol	502					
vCu, unblocked vol	1062	254			577	
tC, single (s)	7.6	6.9			4.2	
tC, 2 stage (s)	6.6					
tF (s)	3.9	3.3			2.3	
p0 queue free %	96	99			98	
cM capacity (veh/h)	346	735			944	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	21	384	248	15	472	472
Volume Left	14	0	0	15	0	0
Volume Right	7	0	56	0	0	0
cSH	420	1700	1700	944	1700	1700
Volume to Capacity	0.05	0.23	0.15	0.02	0.28	0.28
Queue Length 95th (m)	1.3	0.0	0.0	0.4	0.0	0.0
Control Delay (s)	14.0	0.0	0.0	8.9	0.0	0.0
Lane LOS	B			A		
Approach Delay (s)	14.0	0.0		0.1		
Approach LOS	B					

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	36.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	28	126	481	933	33
Future Volume (Veh/h)	13	28	126	481	933	33
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)	13	28	126	481	933	33
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	1.00	1.00	1.00			
vC, conflicting volume	1442	483	966			
vC1, stage 1 conf vol	950					
vC2, stage 2 conf vol	492					
vCu, unblocked vol	1438	476	961			
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 %	96	95	83			
cM capacity (veh/h)	289	539	723			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	13	28	126	240	240	622	344
Volume Left	13	0	126	0	0	0	0
Volume Right	0	28	0	0	0	0	33
cSH	289	539	723	1700	1700	1700	1700
Volume to Capacity	0.04	0.05	0.17	0.14	0.14	0.37	0.20
Queue Length 95th (m)	1.1	1.3	5.0	0.0	0.0	0.0	0.0
Control Delay (s)	18.0	12.0	11.0	0.0	0.0	0.0	0.0
Lane LOS	C	B	B				
Approach Delay (s)	13.9		2.3			0.0	
Approach LOS	B						

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	47.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	6	25	446	921	26
Future Volume (Veh/h)	11	6	25	446	921	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)	11	6	25	446	921	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	1207	474	947			
vC1, stage 1 conf vol	934					
vC2, stage 2 conf vol	273					
vCu, unblocked vol	1139	377	869			
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)	345	603	755			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	17	25	223	223	614	333
Volume Left	11	25	0	0	0	0
Volume Right	6	0	0	0	0	26
cSH	407	755	1700	1700	1700	1700
Volume to Capacity	0.04	0.03	0.13	0.13	0.36	0.20
Queue Length 95th (m)	1.0	0.8	0.0	0.0	0.0	0.0
Control Delay (s)	14.2	9.9	0.0	0.0	0.0	0.0
Lane LOS	B	A				
Approach Delay (s)	14.2	0.5			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	36.3%	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)	143	669	336	400	667	243	94	352	54	208	303
v/c Ratio	0.40	0.63	0.57	0.84	0.48	0.33	0.25	0.38	0.16	0.24	0.58
Control Delay	17.4	37.2	20.7	33.1	24.9	9.1	27.1	34.8	26.0	35.0	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.4	37.2	20.7	33.1	24.9	9.1	27.1	34.8	26.0	35.0	9.1
Queue Length 50th (m)	15.3	69.2	31.3	50.8	58.4	12.3	14.2	34.2	8.0	20.0	0.0
Queue Length 95th (m)	25.7	98.6	67.4	87.7	75.1	29.8	29.1	52.8	18.6	33.2	26.6
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)	372	1060	593	569	1606	819	380	931	336	870	521
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	0.38	0.63	0.57	0.70	0.42	0.30	0.25	0.38	0.16	0.24	0.58

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	143	669	336	400	667	243	94	308	44	54	208	303
Future Volume (vph)	143	669	336	400	667	243	94	308	44	54	208	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	3308		1610	3374	1151
Flt Permitted	0.40	1.00	1.00	0.22	1.00	1.00	0.59	1.00		0.51	1.00	1.00
Satd. Flow (perm)	688	3406	1538	410	3343	1538	993	3308		858	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	336	400	667	243	94	308	44	54	208	303
RTOR Reduction (vph)	0	0	115	0	0	91	0	9	0	0	0	223
Lane Group Flow (vph)	143	669	221	400	667	152	94	343	0	54	208	80
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)	44.3	35.1	35.1	60.5	47.3	47.3	38.4	31.4		35.4	29.9	29.9
Effective Green, g (s)	44.3	35.1	35.1	60.5	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	0.26	0.26
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	1054	476	468	1394	641	373	915		304	889	303
v/s Ratio Prot	0.03	0.20		c0.16	0.20		c0.02	c0.10		0.01	0.06	
v/s Ratio Perm	0.13		0.14	c0.29		0.10	0.07			0.05		0.07
v/c Ratio	0.41	0.63	0.46	0.85	0.48	0.24	0.25	0.38		0.18	0.23	0.26
Uniform Delay, d1	23.1	33.6	31.6	18.9	24.1	21.4	26.4	33.1		27.8	32.8	33.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.8	1.3	0.7	14.1	0.3	0.2	0.4	1.2		0.3	0.6	2.1
Delay (s)	23.9	34.9	32.3	33.0	24.3	21.6	26.7	34.3		28.1	33.4	35.2
Level of Service	C	C	C	C	C	C	C	C		C	C	D
Approach Delay (s)		32.8			26.5			32.7			33.8	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	113.4	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)	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	55.2	7.5	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	55.2	7.5	43.0	22.1	36.0	20.4
Queue Length 50th (m)	2.6	89.0	76.8	22.1	18.6	1.8	5.7	6.3
Queue Length 95th (m)	5.9	117.0	110.3	37.2	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		1.93	0.66		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		59.1	8.3		38.4	41.6		41.1	45.1	
Level of Service	B	C		E	A		D	D		D	D	
Approach Delay (s)		28.4			19.7			39.6			44.5	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	25.6	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	693	16	108	527	171	20	115	114	168	288	97
v/c Ratio	0.03	0.37	0.02	0.32	0.28	0.19	0.05	0.09	0.17	0.36	0.22	0.15
Control Delay	13.6	17.0	2.6	19.1	15.8	2.5	25.2	25.2	5.3	30.6	26.8	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.6	17.0	2.6	19.1	15.8	2.5	25.2	25.2	5.3	30.6	26.8	5.5
Queue Length 50th (m)	1.4	50.4	0.0	14.5	36.2	0.0	3.2	9.7	0.0	30.1	25.6	0.0
Queue Length 95th (m)	4.6	64.1	2.3	28.5	47.5	10.5	8.9	16.5	12.3	50.2	36.6	11.4
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)	424	1887	856	336	1887	924	383	1297	652	463	1297	641
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.37	0.02	0.32	0.28	0.19	0.05	0.09	0.17	0.36	0.22	0.15

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	693	16	108	527	171	20	115	114	168	288	97
Future Volume (vph)	12	693	16	108	527	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	0.43	1.00	1.00	0.34	1.00	1.00	0.56	1.00	1.00	0.68	1.00	1.00
Satd. Flow (perm)	795	3539	1583	630	3539	1583	1048	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	693	16	108	527	171	20	115	114	168	288	97
RTOR Reduction (vph)	0	0	7	0	0	80	0	0	72	0	0	61
Lane Group Flow (vph)	12	693	9	108	527	91	20	115	42	168	288	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)	64.0	64.0	64.0	64.0	64.0	64.0	44.0	44.0	44.0	44.0	44.0	44.0
Effective Green, g (s)	64.0	64.0	64.0	64.0	64.0	64.0	44.0	44.0	44.0	44.0	44.0	44.0
Actuated g/C Ratio	0.53	0.53	0.53	0.53	0.53	0.53	0.37	0.37	0.37	0.37	0.37	0.37
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)	424	1887	844	336	1887	844	384	1297	580	463	1297	580
v/s Ratio Prot		c0.20			0.15			0.03			0.08	
v/s Ratio Perm	0.02		0.01	0.17		0.06	0.02		0.03	c0.13		0.02
v/c Ratio	0.03	0.37	0.01	0.32	0.28	0.11	0.05	0.09	0.07	0.36	0.22	0.06
Uniform Delay, d1	13.3	16.2	13.1	15.8	15.4	13.9	24.5	24.9	24.7	27.8	26.2	24.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.6	0.0	2.5	0.4	0.3	0.3	0.1	0.2	2.2	0.4	0.2
Delay (s)	13.4	16.8	13.2	18.3	15.7	14.1	24.8	25.0	25.0	30.0	26.6	24.8
Level of Service	B	B	B	B	B	B	C	C	C	C	C	C
Approach Delay (s)		16.7			15.7			25.0			27.3	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	56.8%	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	WB	WB	WB	WB	WB
Directions Served	L	T	T	T	TR	T	T	L	L	T	T	TR
Maximum Queue (m)	34.9	81.2	82.5	69.6	48.3	3.1	6.5	65.1	64.4	69.9	79.4	101.2
Average Queue (m)	7.1	24.9	33.3	20.3	18.9	0.1	0.2	35.8	41.5	33.0	41.1	55.8
95th Queue (m)	21.5	58.4	67.0	50.7	42.0	2.2	3.5	55.2	59.1	61.6	69.6	87.4
Link Distance (m)		86.5	86.5	86.5	86.5	66.0	66.0			114.0	114.0	114.0
Upstream Blk Time (%)		1	0	0								0
Queuing Penalty (veh)		2	1	0								0
Storage Bay Dist (m)	70.0							65.0	65.0			
Storage Blk Time (%)		1						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	NB	SB	SB	SB
Directions Served	L	T	R	L	T	TR
Maximum Queue (m)	8.8	11.1	47.2	47.4	119.7	85.6
Average Queue (m)	0.8	1.7	21.0	41.9	39.3	9.1
95th Queue (m)	4.9	7.4	39.6	54.2	104.2	40.7
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		30	0	
Queuing Penalty (veh)		0		4	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)	122.8	124.2	114.3	109.8	78.9	120.6	91.8	81.2	108.5	261.5	294.1	258.0
Average Queue (m)	70.8	83.6	62.7	48.3	15.4	63.6	47.1	41.0	52.0	182.5	207.2	112.0
95th Queue (m)	125.5	130.4	112.8	90.2	51.4	105.6	76.7	69.3	82.0	335.8	353.0	276.4
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	2	0	0							8	1
Queuing Penalty (veh)	7	9	1	1							0	0
Storage Bay Dist (m)					45.0	135.0				300.0		
Storage Blk Time (%)				8		0				2	13	1
Queuing Penalty (veh)				16		1				5	44	4

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

Movement	SB	B36	B36
Directions Served	R	T	T
Maximum Queue (m)	223.0	58.6	55.5
Average Queue (m)	87.8	8.1	6.6
95th Queue (m)	223.4	55.6	50.9
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)	48.9	53.9	89.0	90.0	60.5	154.4	126.5	91.4	114.9	75.8	76.7	52.1
Average Queue (m)	23.4	24.6	15.9	12.4	12.3	75.1	38.9	40.3	63.2	45.7	45.1	23.0
95th Queue (m)	43.0	45.7	59.9	51.0	44.2	132.8	80.3	69.5	95.9	71.8	72.3	42.8
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)				0								
Storage Bay Dist (m)	130.0								130.0	265.0		
Storage Blk Time (%)								0	0			
Queuing Penalty (veh)								0	1			

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

Movement	NB
Directions Served	R
Maximum Queue (m)	38.4
Average Queue (m)	7.9
95th Queue (m)	23.0
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)	72.5	73.0	49.1	41.0	63.0	14.4	48.8	141.1	143.2	146.4	161.9	43.1
Average Queue (m)	37.9	43.4	23.6	21.5	31.3	1.6	4.8	83.2	89.5	112.6	53.7	13.1
95th Queue (m)	61.8	66.4	43.1	36.0	52.5	8.0	23.6	147.3	153.2	163.7	164.4	29.9
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)								1	1	8	3	
Queuing Penalty (veh)								7	8	44	15	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)								18				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)	51.4	24.7	18.6	14.2	55.8
Average Queue (m)	25.3	7.0	5.4	1.9	24.6
95th Queue (m)	43.7	17.4	14.5	8.3	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 (%)	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)	65.2	66.2	38.9	39.6	55.2	64.6	95.9	252.6	255.8	262.2	32.8	39.4
Average Queue (m)	40.8	42.7	12.6	19.6	22.4	22.8	15.7	201.0	241.8	247.7	9.9	19.8
95th Queue (m)	60.6	62.5	28.6	34.9	40.3	46.4	67.3	304.9	275.5	274.7	23.3	37.7
Link Distance (m)			131.2	131.2	131.2			244.4	244.4	244.4		
Upstream Blk Time (%)								5	34	71		
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		9				
Queuing Penalty (veh)	0	0			0	2		6				

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)	20.4	20.4	117.5	219.4	174.8	80.0
Average Queue (m)	5.0	5.3	116.1	201.5	47.8	50.7
95th Queue (m)	14.6	13.5	127.3	276.7	129.4	97.7
Link Distance (m)	218.2	218.2		214.5	214.5	
Upstream Blk Time (%)				47	0	
Queuing Penalty (veh)				246	0	
Storage Bay Dist (m)			110.0			45.0
Storage Blk Time (%)			82	3	1	18
Queuing Penalty (veh)			76	12	6	17

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)	25.8	33.8	43.7	9.1	34.5	49.1	54.5	57.3	203.0	209.0
Average Queue (m)	9.1	9.4	11.6	1.8	10.8	12.2	13.9	6.9	150.1	138.6
95th Queue (m)	20.9	25.7	36.9	7.7	24.7	35.9	38.7	36.7	262.1	254.2
Link Distance (m)	126.0	126.0	60.2	60.2		214.5	214.5		195.2	195.2
Upstream Blk Time (%)			3						27	13
Queuing Penalty (veh)			0						139	69
Storage Bay Dist (m)					70.0			50.0		
Storage Blk Time (%)								0	71	
Queuing Penalty (veh)								0	5	

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)	21.5	33.8	12.5	17.1	38.9	41.1	63.4	249.4	246.9
Average Queue (m)	9.2	10.8	2.3	5.9	9.6	10.3	3.1	93.7	99.9
95th Queue (m)	18.8	27.6	9.4	14.2	28.2	29.2	25.9	232.1	234.9
Link Distance (m)		71.5	75.9		195.2	195.2		247.7	247.7
Upstream Blk Time (%)								4	5
Queuing Penalty (veh)								22	29
Storage Bay Dist (m)	25.0			70.0			70.0		
Storage Blk Time (%)	0							29	
Queuing Penalty (veh)	0							2	

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)	19.9	16.5	22.5	44.2	25.6	50.4	47.9	55.5	147.8	146.3
Average Queue (m)	7.6	4.8	8.4	21.8	7.1	14.7	13.5	12.0	41.8	48.6
95th Queue (m)	16.9	13.1	18.3	36.0	20.4	35.6	34.2	38.5	113.9	120.4
Link Distance (m)				212.1		247.7	247.7		206.7	206.7
Upstream Blk Time (%)									2	1
Queuing Penalty (veh)									7	7
Storage Bay Dist (m)	50.0	50.0	30.0		70.0			65.0		
Storage Blk Time (%)			0	2		0			7	
Queuing Penalty (veh)			0	1		0			6	

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

Movement	WB	NB	NB	SB	SB	SB
Directions Served	LR	T	TR	L	T	T
Maximum Queue (m)	23.1	1.2	1.7	14.6	33.3	25.6
Average Queue (m)	6.7	0.0	0.1	2.4	2.3	2.4
95th Queue (m)	18.2	0.9	1.2	10.1	24.9	26.3
Link Distance (m)	182.2	206.7	206.7		208.0	208.0
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)				15.0		
Storage Blk Time (%)				0	2	
Queuing Penalty (veh)				0	0	

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

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	TR
Maximum Queue (m)	13.2	13.0	21.3	31.6	1.2	5.3
Average Queue (m)	3.5	5.5	11.2	1.3	0.0	0.3
95th Queue (m)	11.2	12.9	19.7	14.5	0.8	2.8
Link Distance (m)	102.1	102.1		208.0	137.8	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	SB
Directions Served	LR	L	T	TR
Maximum Queue (m)	11.6	14.1	17.8	5.5
Average Queue (m)	4.0	4.1	0.8	0.2
95th Queue (m)	11.6	12.0	9.0	2.5
Link Distance (m)	108.5		137.8	92.4
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)	74.8	101.3	117.3	75.0	94.5	111.8	97.9	65.1	55.6	98.5	86.6	30.4
Average Queue (m)	29.3	61.4	61.3	39.8	59.4	53.5	45.0	18.7	19.5	47.3	25.5	10.8
95th Queue (m)	62.7	92.7	96.7	78.9	95.3	95.3	75.1	41.3	39.7	80.2	63.1	23.6
Link Distance (m)		833.7	833.7			287.9	287.9			92.4	92.4	
Upstream Blk Time (%)										0	0	
Queuing Penalty (veh)										1	0	
Storage Bay Dist (m)	25.0			25.0	40.0			25.0	100.0			40.0
Storage Blk Time (%)	7	39	41	11	26	12	22	1		0		0
Queuing Penalty (veh)	24	56	139	35	85	48	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)	53.3	73.2	68.6	9.8
Average Queue (m)	25.5	19.9	38.8	0.4
95th Queue (m)	44.8	57.7	66.9	7.4
Link Distance (m)	101.3	101.3		41.5
Upstream Blk Time (%)		0		0
Queuing Penalty (veh)		0		0
Storage Bay Dist (m)			50.0	
Storage Blk Time (%)	2	0	5	
Queuing Penalty (veh)	1	0	5	

Intersection: 37: Bend

Movement	NB
Directions Served	T
Maximum Queue (m)	25.6
Average Queue (m)	0.9
95th Queue (m)	18.1
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	B38	B38	NB
Directions Served	L	T	T	TR	L	T	T	TR	T	T	T	L
Maximum Queue (m)	46.2	109.5	109.7	105.7	32.4	89.6	69.0	64.6	44.4	24.8	6.6	60.0
Average Queue (m)	10.2	57.7	68.2	61.0	31.4	65.7	42.6	37.7	5.3	1.1	0.2	22.8
95th Queue (m)	32.1	93.1	101.0	96.2	35.7	102.8	70.8	59.5	24.6	11.7	4.7	45.7
Link Distance (m)		286.7	286.7	286.7		66.0	66.0	66.0	86.5	86.5	86.5	
Upstream Blk Time (%)						17	1	0				
Queuing Penalty (veh)						101	3	2				
Storage Bay Dist (m)	60.0				25.0							45.0
Storage Blk Time (%)		6			47	2						3
Queuing Penalty (veh)		3			198	10						0

Intersection: 39: Bryne Drive & Mapleview Drive W

Movement	NB	NB	SB	SB	SB
Directions Served	T	TR	L	T	TR
Maximum Queue (m)	32.4	22.9	30.0	38.6	41.4
Average Queue (m)	4.8	6.2	8.7	16.1	15.3
95th Queue (m)	18.2	16.2	22.6	31.5	29.1
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			0	
Queuing Penalty (veh)	0			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)	12.6	83.7	78.0	13.0	45.9	58.6	58.2	29.1	11.6	33.6	16.5	21.0
Average Queue (m)	2.1	44.7	38.8	2.1	21.0	26.6	30.3	12.0	3.4	15.1	3.4	7.7
95th Queue (m)	8.8	68.3	66.5	8.6	39.6	51.5	54.1	23.0	10.1	27.4	10.9	16.6
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 (%)		2	1			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)	53.1	52.3	44.7	15.8
Average Queue (m)	31.3	32.1	16.7	6.9
95th Queue (m)	49.2	49.0	36.6	14.0
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	0	0	
Queuing Penalty (veh)	0	0	0	

Network Summary

Network wide Queuing Penalty: 1609

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	314	1856	1691	761	464	229
v/c Ratio	0.69	0.53	0.66	0.52	0.74	0.42
Control Delay	39.5	6.9	10.7	3.7	49.0	28.3
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	39.5	7.2	10.7	3.7	49.0	28.3
Queue Length 50th (m)	23.6	0.0	32.0	6.8	51.4	17.8
Queue Length 95th (m)	m37.2	125.6	47.9	m68.8	65.0	29.0
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	507	3514	2546	1468	825	703
Starvation Cap Reductn	0	864	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	0.62	0.70	0.66	0.52	0.56	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)	314	1856	0	0	1691	761	464	0	229	0	0	0
Future Volume (vph)	314	1856	0	0	1691	761	464	0	229	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	1691	761	464	0	229	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	1691	761	464	0	173	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)	15.5	76.8			57.3	110.0	21.2		21.2			
Effective Green, g (s)	15.5	76.8			57.3	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)	452	3516			2548	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	0.69	0.53			0.66	0.52	0.74		0.35			
Uniform Delay, d1	45.0	7.9			19.3	0.0	41.8		38.4			
Progression Factor	0.75	0.77			0.48	1.00	1.00		1.00			
Incremental Delay, d2	3.2	0.4			0.8	0.8	4.8		0.4			
Delay (s)	36.9	6.5			10.0	0.8	46.6		38.9			
Level of Service	D	A			B	A	D		D			
Approach Delay (s)		10.9			7.1			44.1			0.0	
Approach LOS		B			A			D			A	

Intersection Summary

HCM 2000 Control Delay	13.5	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	78.0%	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	1554	30	13	2096	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	67.0	2.4	0.0	3.9	17.3	0.1	51.2	23.7	52.1	48.5	8.7
Queue Delay	0.0	0.0	0.0	0.0	5.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.0	2.4	0.0	3.9	22.4	0.1	51.2	23.7	52.1	48.5	8.7
Queue Length 50th (m)	39.2	14.6	0.0	0.5	44.2	0.0	20.2	2.5	5.9	2.2	4.2
Queue Length 95th (m)	55.3	23.1	m0.0	m0.6	#223.2	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	270	2358	783	835	427	125	132	533
Starvation Cap Reductn	0	0	0	0	218	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	0.98	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	1554	30	13	2096	90	180	12	28	27	10	178
Future Volume (vph)	321	1554	30	13	2096	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	291	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	1554	30	13	2096	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	1554	19	13	2096	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	158	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	1.56	0.21	1.00	0.49	0.49	0.01	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	0.5	0.0	0.1	4.2	0.1	1.1	0.2		2.5	0.6	0.2
Delay (s)	63.4	2.7	7.3	7.5	17.9	0.2	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)		13.0			17.1			47.1			37.3	
Approach LOS		B			B			D			D	

Intersection Summary

HCM 2000 Control Delay	17.8	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	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	401	904	303	62	1608	146	108	65	368	184	483
v/c Ratio	0.98	0.41	0.37	0.19	0.90	0.24	0.55	0.08	0.83	0.21	0.95
Control Delay	97.6	18.2	4.2	14.9	41.3	4.8	60.5	13.1	48.8	31.5	55.6
Queue Delay	0.0	0.0	0.0	0.0	28.6	0.0	0.0	0.0	0.0	0.0	1.5
Total Delay	97.6	18.2	4.2	14.9	70.0	4.8	60.5	13.1	48.8	31.5	57.1
Queue Length 50th (m)	~53.6	31.2	3.7	6.6	124.6	0.0	12.4	1.7	62.9	16.6	71.3
Queue Length 95th (m)	#89.4	38.2	21.1	13.6	146.2	12.9	21.8	7.2	#116.1	26.1	#137.6
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)	411	2200	812	323	1791	620	200	908	441	922	529
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	270	0	0	0	0	0	9
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.41	0.37	0.19	1.06	0.24	0.54	0.07	0.83	0.20	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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	401	904	303	62	1608	146	108	21	44	368	184	483
Future Volume (vph)	401	904	303	62	1608	146	108	21	44	368	184	483
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	0.97	0.91	1.00	1.00	0.91	1.00	0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	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	0.90		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)	3213	4988	1458	1719	4988	1462	3019	3094		1626	3252	1417
Flt Permitted	0.95	1.00	1.00	0.30	1.00	1.00	0.95	1.00		0.61	1.00	1.00
Satd. Flow (perm)	3213	4988	1458	547	4988	1462	3019	3094		1050	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)	401	904	303	62	1608	146	108	21	44	368	184	483
RTOR Reduction (vph)	0	0	175	0	0	95	0	34	0	0	0	129
Lane Group Flow (vph)	401	904	128	62	1608	51	108	31	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	Perm	Prot	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6				4		4
Actuated Green, G (s)	14.1	46.5	46.5	44.2	38.3	38.3	7.2	24.8		41.6	30.4	30.4
Effective Green, g (s)	14.1	46.5	46.5	44.2	38.3	38.3	7.2	24.8		41.6	30.4	30.4
Actuated g/C Ratio	0.13	0.42	0.42	0.40	0.35	0.35	0.07	0.23		0.38	0.28	0.28
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)	411	2108	616	282	1736	509	197	697		464	898	391
v/s Ratio Prot	c0.12	0.18		0.01	c0.32		0.04	0.01		c0.09	0.06	
v/s Ratio Perm			0.09	0.08		0.03				0.21		c0.25
v/c Ratio	0.98	0.43	0.21	0.22	0.93	0.10	0.55	0.04		0.79	0.20	0.91
Uniform Delay, d1	47.8	22.4	20.1	20.4	34.5	24.2	49.8	33.3		29.3	30.5	38.4
Progression Factor	1.30	0.79	1.15	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	35.7	0.6	0.7	0.4	10.0	0.4	3.1	0.0		9.0	0.1	23.8
Delay (s)	97.7	18.3	23.9	20.8	44.5	24.6	52.9	33.4		38.3	30.6	62.2
Level of Service	F	B	C	C	D	C	D	C		D	C	E
Approach Delay (s)		39.2			42.1			45.6			48.1	
Approach LOS		D			D			D			D	

Intersection Summary

HCM 2000 Control Delay	42.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	87.9%	ICU Level of Service	E
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)	55.5	50.4	91.6	102.7	76.4	156.4	138.4	120.0	47.2	84.0	84.9	57.0
Average Queue (m)	24.6	23.3	12.0	10.9	11.6	80.8	43.9	39.7	7.5	45.1	46.0	25.0
95th Queue (m)	45.0	43.3	48.8	49.4	43.5	152.5	102.1	81.0	31.9	70.2	73.5	46.2
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						
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)	41.0
Average Queue (m)	9.6
95th Queue (m)	27.4
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)	62.8	65.7	47.4	33.5	47.6	13.4	48.6	129.8	135.7	144.2	161.2	45.6
Average Queue (m)	35.2	40.5	21.6	18.7	28.7	1.6	4.4	61.4	67.5	93.2	32.4	12.6
95th Queue (m)	54.5	58.2	41.8	31.5	45.8	7.6	20.2	120.8	137.5	157.6	124.0	29.2
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)								1	1	5	1	
Queuing Penalty (veh)								3	3	28	8	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)								10				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)	49.1	23.3	26.6	14.6	53.9
Average Queue (m)	25.3	6.8	6.5	2.4	22.9
95th Queue (m)	42.8	16.4	17.4	8.5	42.1
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	WB	NB
Directions Served	L	L	T	T	T	R	L	T	T	T	R	L
Maximum Queue (m)	72.7	72.8	35.6	40.6	42.7	59.0	72.5	158.6	180.6	194.6	77.7	41.6
Average Queue (m)	43.5	45.1	13.3	19.7	21.6	23.3	11.6	89.1	96.1	114.6	19.3	10.9
95th Queue (m)	66.8	68.0	28.5	34.8	35.7	46.2	44.3	142.2	179.8	200.1	79.2	27.6
Link Distance (m)			131.2	131.2	131.2			244.0	244.0	244.0	244.0	
Upstream Blk Time (%)								0	1	2	1	
Queuing Penalty (veh)								0	0	0	0	
Storage Bay Dist (m)	70.0	70.0				50.0	120.0					95.0
Storage Blk Time (%)	1	1			0	1		2				
Queuing Penalty (veh)	2	3			0	2		1				

Intersection: 15: Bayview Drive & Mapleview Drive W

Movement	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	T	TR	L	T	T	R
Maximum Queue (m)	50.8	21.2	20.9	117.5	216.5	164.8	80.0
Average Queue (m)	22.3	5.3	6.1	116.6	196.4	46.1	45.3
95th Queue (m)	42.4	15.3	14.8	123.0	274.4	122.1	92.6
Link Distance (m)		218.2	218.2		211.7	211.7	
Upstream Blk Time (%)					42		
Queuing Penalty (veh)					219		
Storage Bay Dist (m)	95.0			110.0			45.0
Storage Blk Time (%)				82	6	1	14
Queuing Penalty (veh)				75	22	3	13

Zone Summary

Zone wide Queuing Penalty: 384

Queues
2036 Future Background - AM Peak Hour - DDI

1: West Terminal-E-S

Lane Group	WBT	NET
Lane Group Flow (vph)	1725	1496
v/c Ratio	0.70	0.76
Control Delay	11.7	31.5
Queue Delay	0.2	0.0
Total Delay	11.9	31.5
Queue Length 50th (m)	37.1	98.4
Queue Length 95th (m)	47.4	110.9
Internal Link Dist (m)	43.5	23.7
Turn Bay Length (m)		
Base Capacity (vph)	2482	2134
Starvation Cap Reductn	191	0
Spillback Cap Reductn	75	4
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.75	0.70

Intersection Summary

HCM Signalized Intersection Capacity Analysis
2036 Future Background - AM Peak Hour - DDI

1: West Terminal-E-S

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					0.48			1.00				
Incremental Delay, d2					1.2			1.8				
Delay (s)					11.3			30.7				
Level of Service					B			C				
Approach Delay (s)		0.0			11.3			30.7			0.0	
Approach LOS		A			B			C			A	

Intersection Summary

HCM 2000 Control Delay	20.3	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	15	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	1691
v/c Ratio	0.84	0.75
Control Delay	20.4	27.7
Queue Delay	0.6	0.0
Total Delay	21.0	27.7
Queue Length 50th (m)	67.3	109.9
Queue Length 95th (m)	77.2	130.2
Internal Link Dist (m)	50.1	8.2
Turn Bay Length (m)		
Base Capacity (vph)	2314	2261
Starvation Cap Reductn	165	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.86	0.75

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	1691	0
Future Volume (vph)	0	1856	0	0	0	0	0	0	0	0	1691	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	1691	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	1691	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)		47.7									50.3	
Effective Green, g (s)		47.7									50.3	
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)		2208									2262	
v/s Ratio Prot		c0.36									c0.34	
v/s Ratio Perm												
v/c Ratio		0.84									0.75	
Uniform Delay, d1		27.8									24.6	
Progression Factor		0.62									1.00	
Incremental Delay, d2		2.5									2.3	
Delay (s)		19.6									26.9	
Level of Service		B									C	
Approach Delay (s)		19.6			0.0			0.0			26.9	
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	78.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

4: West Terminal-E-S

Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Traffic Volume (veh/h)	0	0	429	1725	0	0
Future Volume (Veh/h)	0	0	429	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	429	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					0.71	
vC, conflicting volume			0		1433	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		166	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		417	1091

Direction, Lane #	WB 1	WB 2	WB 3
Volume Total	774	690	690
Volume Left	429	0	0
Volume Right	0	0	0
cSH	1558	1700	1700
Volume to Capacity	0.28	0.41	0.41
Queue Length 95th (m)	8.6	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	61.0%	ICU Level of Service	B
Analysis Period (min)	15		

5: W-S

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	2.5	26.7
Queue Delay	0.0	0.0
Total Delay	2.5	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			0.04			1.00
Incremental Delay, d2			1.6			2.3
Delay (s)			2.5			26.7
Level of Service			A			C
Approach Delay (s)		0.0	2.5		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

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (veh/h)	0	0	1691	761	0	0
Future Volume (Veh/h)	0	0	1691	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	1691	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	2452				1691	564
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2452				1691	564
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				86	474

Direction, Lane #	WB 1	WB 2	WB 3	WB 4
Volume Total	564	564	564	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	78.5%	ICU Level of Service	D
Analysis Period (min)	15		

Lane Group	EBT	NBR
Lane Group Flow (vph)	1856	229
v/c Ratio	0.78	0.20
Control Delay	1.5	18.1
Queue Delay	0.1	0.0
Total Delay	1.6	18.1
Queue Length 50th (m)	0.0	15.7
Queue Length 95th (m)	0.0	24.4
Internal Link Dist (m)	26.5	
Turn Bay Length (m)		
Base Capacity (vph)	2383	1169
Starvation Cap Reductn	44	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.79	0.20

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1856	0	0	0	0	229
Future Volume (vph)	1856	0	0	0	0	229
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	229
RTOR Reduction (vph)	0	0	0	0	0	4
Lane Group Flow (vph)	1856	0	0	0	0	225
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	c0.36					
v/s Ratio Perm						c0.09
v/c Ratio	0.78					0.19
Uniform Delay, d1	24.5					18.2
Progression Factor	0.00					1.00
Incremental Delay, d2	1.5					0.4
Delay (s)	1.5					18.6
Level of Service	A					B
Approach Delay (s)	1.5			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	0.49			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0	
Intersection Capacity Utilization	78.5%	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)	1691	464
v/c Ratio	0.78	0.31
Control Delay	4.7	19.8
Queue Delay	0.0	0.0
Total Delay	4.7	19.8
Queue Length 50th (m)	5.2	31.7
Queue Length 95th (m)	5.7	43.1
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	0.78	0.31

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1691	464	0
Future Volume (vph)	0	0	0	1691	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	1691	464	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	1691	464	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				c0.34	c0.14	
v/s Ratio Perm						
v/c Ratio				0.78	0.31	
Uniform Delay, d1				26.5	19.1	
Progression Factor				0.11	1.00	
Incremental Delay, d2				1.9	0.5	
Delay (s)				4.7	19.6	
Level of Service				A	B	
Approach Delay (s)	0.0			4.7	19.6	
Approach LOS	A			A	B	

Intersection Summary

HCM 2000 Control Delay	7.9	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	64.8%	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)	53.9	54.3	48.1	30.3	29.6	27.2
Average Queue (m)	40.8	41.9	32.5	25.0	23.4	19.8
95th Queue (m)	53.4	52.3	49.6	29.5	26.2	29.3
Link Distance (m)	18.6	18.6	18.6	22.8	22.8	22.8
Upstream Blk Time (%)	38	49	37	52	37	13
Queuing Penalty (veh)	218	280	215	260	187	66
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)	27.9	22.1	15.4	62.4	61.8
Average Queue (m)	10.6	2.6	0.8	50.6	36.9
95th Queue (m)	20.6	12.3	6.0	66.0	55.5
Link Distance (m)	22.8	22.8	22.8	37.0	37.0
Upstream Blk Time (%)	2	1	0	21	7
Queuing Penalty (veh)	8	3	1	70	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)	69.7	63.9	59.4	45.6	46.7	45.3
Average Queue (m)	58.8	56.6	49.7	36.8	37.3	28.3
95th Queue (m)	64.0	61.9	64.8	41.5	41.8	45.7
Link Distance (m)	27.3	27.3	27.3	19.8	19.8	19.8
Upstream Blk Time (%)	41	46	39	57	46	21
Queuing Penalty (veh)	251	283	240	322	258	117
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)	56.7	62.2	43.9
Average Queue (m)	21.4	11.3	4.2
95th Queue (m)	50.4	40.2	23.3
Link Distance (m)	59.5	59.5	59.5
Upstream Blk Time (%)	1	0	0
Queuing Penalty (veh)	4	3	3
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)	191.2	176.4	110.7	3.3
Average Queue (m)	122.1	103.6	40.8	0.1
95th Queue (m)	175.8	158.1	93.6	2.3
Link Distance (m)	183.8	183.8	183.8	183.8
Upstream Blk Time (%)	1	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)	14.4	18.3	18.7	66.1	60.0
Average Queue (m)	1.5	5.9	3.9	54.4	38.6
95th Queue (m)	7.6	14.6	12.9	67.0	53.1
Link Distance (m)	7.7	7.7	7.7	37.2	37.2
Upstream Blk Time (%)	5	25	15	27	8
Queuing Penalty (veh)	26	143	84	98	30
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)	193.5	166.8	126.5
Average Queue (m)	134.5	116.0	50.4
95th Queue (m)	188.9	161.5	109.8
Link Distance (m)	187.5	187.5	187.5
Upstream Blk Time (%)	1	0	
Queuing Penalty (veh)	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)	6.1	18.3	15.8	50.3	44.2
Average Queue (m)	0.4	1.8	2.1	24.9	12.0
95th Queue (m)	3.5	8.6	9.9	44.0	33.4
Link Distance (m)	20.9	20.9	20.9	48.7	48.7
Upstream Blk Time (%)	0	1	1	0	0
Queuing Penalty (veh)	0	4	4	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)	71.7	62.5	57.4
Average Queue (m)	34.5	25.6	11.2
95th Queue (m)	61.7	55.0	37.0
Link Distance (m)	54.6	54.6	54.6
Upstream Blk Time (%)	2	1	1
Queuing Penalty (veh)	16	8	6
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)	37.7	43.0	39.6	64.3	42.9
Average Queue (m)	26.3	22.3	14.1	47.2	29.5
95th Queue (m)	36.5	37.6	32.9	67.3	48.4
Link Distance (m)	31.8	31.8	31.8	39.6	39.6
Upstream Blk Time (%)	6	2	1	14	2
Queuing Penalty (veh)	35	13	7	32	4
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 3324

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	76.4	10.3	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	76.4	10.5	30.2	49.3	41.0	46.0	18.8
Queue Length 50th (m)	3.8	60.3	45.4	91.5	11.3	23.0	42.7	70.2	2.1
Queue Length 95th (m)	15.5	58.8	64.0	178.3	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	649	0	0	0	0	29	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.79	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		1.25	0.38		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		73.1	10.2		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			21.4			62.2			44.3	
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	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	461	1933	677	278
v/c Ratio	0.86	0.29	0.94	0.56	0.84	0.40
Control Delay	27.9	6.0	41.8	11.4	57.1	33.5
Queue Delay	0.3	0.0	0.0	0.8	1.6	0.0
Total Delay	28.3	6.0	41.8	12.1	58.8	33.5
Queue Length 50th (m)	166.6	4.8	94.7	151.3	89.2	27.8
Queue Length 95th (m)	115.8	m10.7	m#162.9	174.7	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)	2484	655	502	3432	906	778
Starvation Cap Reductn	65	0	0	1047	0	0
Spillback Cap Reductn	35	0	0	290	100	3
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.29	0.92	0.81	0.84	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	461	1933	0	0	0	0	677	0	278
Future Volume (vph)	0	2139	189	461	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	134	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	461	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	461	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)		50.4	50.4	86.9	86.9					31.1		31.1
Effective Green, g (s)		50.4	50.4	86.9	86.9					31.1		31.1
Actuated g/C Ratio		0.39	0.39	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)		2484	602	490	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		0.86	0.23	0.94	0.56					0.84		0.36
Uniform Delay, d1		36.6	26.7	39.7	11.5					47.1		41.1
Progression Factor		0.65	0.33	0.56	0.92					1.00		1.00
Incremental Delay, d2		3.2	0.7	18.7	0.4					7.9		0.3
Delay (s)		27.1	9.5	40.7	10.9					55.0		41.5
Level of Service		C	A	D	B					E		D
Approach Delay (s)		25.6			16.6			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	0.93		
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	1899	1061	495	565
v/c Ratio	0.96	0.61	0.81	1.02	0.69	0.92
Control Delay	52.7	15.0	21.1	31.5	53.2	66.0
Queue Delay	0.0	4.2	0.2	23.6	0.1	0.0
Total Delay	52.7	19.2	21.3	55.1	53.3	66.0
Queue Length 50th (m)	84.7	172.4	76.0	~107.0	63.6	76.7
Queue Length 95th (m)	m#128.1	193.1	m69.6	m49.5	83.0	#112.5
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	709	3522	2348	1037	739	634
Starvation Cap Reductn	0	1295	0	61	0	0
Spillback Cap Reductn	0	0	62	0	13	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.96	0.83	1.09	0.68	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.
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	1899	1061	495	0	565	0	0	0
Future Volume (vph)	683	2133	0	0	1899	1061	495	0	565	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	1899	1061	495	0	565	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	1899	754	495	0	518	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)	26.9	90.9			60.0	60.0	27.1		27.1			
Effective Green, g (s)	26.9	90.9			60.0	60.0	27.1		27.1			
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)	710	3521			2346	730	715		569			
v/s Ratio Prot	c0.20	0.42			0.37		0.14					
v/s Ratio Perm						c0.48			c0.19			
v/c Ratio	0.96	0.61			0.81	1.03	0.69		0.91			
Uniform Delay, d1	51.0	10.2			30.1	35.0	47.6		50.3			
Progression Factor	0.67	1.40			0.69	0.97	1.00		1.00			
Incremental Delay, d2	16.1	0.4			0.3	20.0	2.9		18.8			
Delay (s)	50.1	14.7			20.9	54.0	50.5		69.1			
Level of Service	D	B			C	D	D		E			
Approach Delay (s)		23.3			32.8			60.4			0.0	
Approach LOS		C			C			E			A	

Intersection Summary

HCM 2000 Control Delay	33.1	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	1892	70	72	1777	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	45.0	0.5	26.8	88.4	6.7	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	45.0	0.5	26.8	88.5	6.7	56.7	33.0	64.8	48.8	152.6
Queue Length 50th (m)	~68.5	~207.6	0.1	7.3	~196.0	4.8	91.3	16.3	58.8	11.6	~132.1
Queue Length 95th (m)	m#99.0	#234.5	m0.4	m8.4	m#226.9	m7.1	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	602	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	1.15	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	1892	70	72	1777	256	693	65	26	227	50	492
Future Volume (vph)	417	1892	70	72	1777	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	1892	70	72	1777	256	693	65	26	227	50	492
RTOR Reduction (vph)	0	0	44	0	0	120	0	11	0	0	0	118
Lane Group Flow (vph)	417	1892	26	72	1777	136	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	33.4	47.1	39.5		50.4	45.2	53.5
Progression Factor	1.19	0.48	0.21	1.13	0.71	0.51	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	105.5	28.7	0.1	1.2	57.4	0.6	7.5	0.2		7.3	0.2	163.8
Delay (s)	175.0	48.2	5.6	38.7	88.9	17.6	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)		69.2			78.5			52.9			159.0	
Approach LOS		E			E			D			F	

Intersection Summary

HCM 2000 Control Delay	81.8	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	99.6%	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)	590	1415	142	55	1515	226	312	358	171	588
v/c Ratio	0.93	0.57	0.19	0.28	0.92	0.85	0.45	0.94	0.20	0.97
Control Delay	78.5	19.8	5.2	19.4	51.9	86.5	38.5	68.3	38.6	51.1
Queue Delay	0.0	0.2	0.0	0.0	45.4	0.0	0.0	0.0	0.0	2.7
Total Delay	78.5	20.0	5.2	19.4	97.4	86.5	38.5	68.3	38.6	53.8
Queue Length 50th (m)	87.7	60.5	5.4	6.7	146.2	31.5	30.8	73.7	18.6	81.2
Queue Length 95th (m)	m87.3	m60.2	m5.8	13.5	#181.9	#53.9	45.5	#131.9	28.6	#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)	634	2473	729	203	1640	266	782	381	962	640
Starvation Cap Reductn	0	298	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	294	0	0	0	0	18
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.65	0.19	0.27	1.13	0.85	0.40	0.94	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)	590	1415	142	55	1292	223	226	211	101	358	171	588
Future Volume (vph)	590	1415	142	55	1292	223	226	211	101	358	171	588
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	302	4865		3467	3308		713	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)	590	1415	142	55	1292	223	226	211	101	358	171	588
RTOR Reduction (vph)	0	0	66	0	18	0	0	46	0	0	0	238
Lane Group Flow (vph)	590	1415	76	55	1497	0	226	266	0	358	171	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)	25.0	62.4	62.4	49.2	43.3		10.0	25.7		45.7	31.7	31.7
Effective Green, g (s)	25.0	62.4	62.4	49.2	43.3		10.0	25.7		45.7	31.7	31.7
Actuated g/C Ratio	0.19	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)	635	2440	656	177	1620		266	653		370	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	0.93	0.58	0.12	0.31	0.92		0.85	0.41		0.97	0.20	0.94
Uniform Delay, d1	51.6	24.4	18.6	26.0	41.8		59.3	45.5		38.4	39.0	48.3
Progression Factor	1.39	0.77	1.04	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.2	0.3	0.1	1.0	10.4		21.6	0.4		37.8	0.1	32.2
Delay (s)	78.8	19.1	19.4	27.0	52.1		80.8	45.9		76.2	39.1	80.4
Level of Service	E	B	B	C	D		F	D		E	D	F
Approach Delay (s)		35.5			51.3			60.6			72.7	
Approach LOS		D			D			E			E	

Intersection Summary

HCM 2000 Control Delay	50.4	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	92.9%	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)	278	28	17	103	921	13	1105
v/c Ratio	0.64	0.17	0.06	0.32	0.39	0.03	0.55
Control Delay	30.5	34.1	15.3	8.2	9.4	6.2	14.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.5	34.1	15.3	8.2	9.4	6.2	14.6
Queue Length 50th (m)	16.5	4.8	0.2	6.5	42.1	0.8	74.5
Queue Length 95th (m)	30.8	12.2	6.0	14.2	83.3	3.1	105.9
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	324	2338	472	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	0.39	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	892	29	13	958	147
Future Volume (vph)	149	1	128	28	1	16	103	892	29	13	958	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	3379	
Flt Permitted		0.81		0.35	1.00		0.19	1.00		0.30	1.00	
Satd. Flow (perm)		2689		534	1632		327	3426		569	3379	
Peak-hour factor, PHF	1.00	1.00	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	892	29	13	958	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	920	0	13	1097	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		315	2231		362	2022	
v/s Ratio Prot				c0.01	0.00		c0.02	0.27		0.00	c0.32	
v/s Ratio Perm		c0.06		0.03			0.21			0.02		
v/c Ratio		0.53		0.21	0.01		0.33	0.41		0.04	0.54	
Uniform Delay, d1		45.1		36.5	35.7		7.3	9.0		8.3	12.9	
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	1.0	
Delay (s)		46.9		37.3	35.7		7.9	9.6		8.3	13.9	
Level of Service		D		D	D		A	A		A	B	
Approach Delay (s)		46.9			36.7			9.4			13.9	
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	0.51		
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	969	1181
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	11.4
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	11.4
Queue Length 50th (m)	28.1	0.2	0.0	0.0	2.9	25.2	55.3
Queue Length 95th (m)	48.4	1.6	12.3	0.0	11.3	61.3	112.4
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	523	387	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	968	1	0	1026	155
Future Volume (vph)	154	1	93	0	0	1	89	968	1	0	1026	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			3468	
Flt Permitted	0.70	1.00	1.00		1.00		0.17	1.00			1.00	
Satd. Flow (perm)	1307	1900	1233		1615		322	3471			3468	
Peak-hour factor, PHF	1.00	1.00	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	968	1	0	1026	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	969	0	0	1173	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		314	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				0.18					
v/c Ratio	0.54	0.00	0.08		0.00		0.28	0.40			0.56	
Uniform Delay, d1	37.4	34.1	34.6		48.5		6.8	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		7.3	6.5			12.8	
Level of Service	D	C	C		D		A	A			B	
Approach Delay (s)		37.7			48.5			6.6			12.8	
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	1005	89	1163
v/c Ratio	0.26	0.07	0.17	0.19	0.11	0.22	0.56	0.32	0.64
Control Delay	34.0	42.1	3.3	33.1	21.8	10.0	21.1	11.6	22.8
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	21.1	11.6	22.8
Queue Length 50th (m)	18.8	4.8	0.0	12.8	1.9	5.5	85.5	7.8	104.6
Queue Length 95th (m)	33.6	12.6	4.2	24.9	11.2	10.8	105.6	14.5	128.1
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)	390	332	361	360	297	287	1794	274	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	0.22	0.56	0.32	0.64

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	955	50	89	1049	114
Future Volume (vph)	101	23	62	70	9	23	64	955	50	89	1049	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	3466		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		284	3466		309	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	955	50	89	1049	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	1002	0	89	1156	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		282	1790		268	1802	
v/s Ratio Prot	c0.02	0.01		0.01	0.01		0.02	0.29		c0.02	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	0.56		0.33	0.64	
Uniform Delay, d1	35.8	41.3	41.1	36.8	42.0		13.1	19.7		12.4	21.0	
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		3.3	1.8	
Delay (s)	37.6	41.7	41.4	38.2	42.3		15.0	21.0		15.7	22.7	
Level of Service	D	D	D	D	D		B	C		B	C	
Approach Delay (s)		39.4			39.5			20.6			22.2	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM 2000 Control Delay	23.5	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	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	82	32	1082	20	8	1004
Future Volume (Veh/h)	82	32	1082	20	8	1004
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)	82	32	1082	20	8	1004
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	
vC, conflicting volume	1613	555			1105	
vC1, stage 1 conf vol	1095					
vC2, stage 2 conf vol	518					
vCu, unblocked vol	1284	0			655	
tC, single (s)	6.9	6.9			4.1	
tC, 2 stage (s)	5.9					
tF (s)	3.5	3.3			2.2	
p0 queue free %	75	96			99	
cM capacity (veh/h)	329	879			759	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	114	721	381	8	502	502
Volume Left	82	0	0	8	0	0
Volume Right	32	0	20	0	0	0
cSH	399	1700	1700	759	1700	1700
Volume to Capacity	0.29	0.42	0.22	0.01	0.30	0.30
Queue Length 95th (m)	9.3	0.0	0.0	0.3	0.0	0.0
Control Delay (s)	17.6	0.0	0.0	9.8	0.0	0.0
Lane LOS	C			A		
Approach Delay (s)	17.6	0.0		0.1		
Approach LOS	C					

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	45	126	39	1072	905	15
Future Volume (Veh/h)	45	126	39	1072	905	15
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)	45	126	39	1072	905	15
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	1528	461	921			
vC1, stage 1 conf vol	914					
vC2, stage 2 conf vol	614					
vCu, unblocked vol	1421	278	771			
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 %	86	81	95			
cM capacity (veh/h)	319	676	795			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	45	126	39	536	536	603	317
Volume Left	45	0	39	0	0	0	0
Volume Right	0	126	0	0	0	0	15
cSH	319	676	795	1700	1700	1700	1700
Volume to Capacity	0.14	0.19	0.05	0.32	0.32	0.35	0.19
Queue Length 95th (m)	3.9	5.4	1.2	0.0	0.0	0.0	0.0
Control Delay (s)	18.1	11.5	9.8	0.0	0.0	0.0	0.0
Lane LOS	C	B	A				
Approach Delay (s)	13.3		0.3			0.0	
Approach LOS	B						

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	42.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	40	26	10	1039	847	17
Future Volume (Veh/h)	40	26	10	1039	847	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)	40	26	10	1039	847	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	0.92	0.92	0.92			
vC, conflicting volume	1397	434	866			
vC1, stage 1 conf vol	858					
vC2, stage 2 conf vol	540					
vCu, unblocked vol	1252	202	673			
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	97	99			
cM capacity (veh/h)	363	743	849			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	66	10	520	520	565	299
Volume Left	40	10	0	0	0	0
Volume Right	26	0	0	0	0	17
cSH	454	849	1700	1700	1700	1700
Volume to Capacity	0.15	0.01	0.31	0.31	0.33	0.18
Queue Length 95th (m)	4.0	0.3	0.0	0.0	0.0	0.0
Control Delay (s)	14.3	9.3	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	39.2%	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)	219	861	202	291	589	228	332	741	176	363	240
v/c Ratio	0.72	0.83	0.38	0.85	0.53	0.39	0.73	0.71	0.68	0.44	0.47
Control Delay	32.3	47.4	14.0	50.8	36.1	15.4	35.0	38.6	37.5	41.1	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.3	47.4	14.0	50.8	36.1	15.4	35.0	38.6	37.5	41.1	8.1
Queue Length 50th (m)	31.3	105.7	12.2	49.7	63.4	16.7	57.5	80.5	27.4	41.1	0.0
Queue Length 95th (m)	50.1	#132.3	33.2	#94.2	83.3	39.7	84.1	103.5	#46.3	56.7	22.0
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)	331	1032	534	371	1107	584	462	1048	265	830	511
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	0.83	0.38	0.78	0.53	0.39	0.72	0.71	0.66	0.44	0.47

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	202	291	589	228	332	519	222	176	363	240
Future Volume (vph)	219	861	202	291	589	228	332	519	222	176	363	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	0.96		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	3390		1770	3539	1396
Flt Permitted	0.31	1.00	1.00	0.12	1.00	1.00	0.39	1.00		0.24	1.00	1.00
Satd. Flow (perm)	415	3471	1476	222	3574	1583	709	3390		454	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	202	291	589	228	332	519	222	176	363	240
RTOR Reduction (vph)	0	0	96	0	0	94	0	39	0	0	0	184
Lane Group Flow (vph)	219	861	106	291	589	134	332	702	0	176	363	56
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)	51.4	35.0	35.0	54.4	36.5	36.5	48.7	35.0		37.3	27.6	27.6
Effective Green, g (s)	51.4	35.0	35.0	54.4	36.5	36.5	48.7	35.0		37.3	27.6	27.6
Actuated g/C Ratio	0.44	0.30	0.30	0.46	0.31	0.31	0.41	0.30		0.32	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)	298	1033	439	338	1109	491	442	1008		252	830	327
v/s Ratio Prot	0.10	0.25		c0.13	0.16		c0.11	0.21		0.06	0.10	
v/s Ratio Perm	0.22		0.07	c0.27		0.08	c0.20			0.16		0.04
v/c Ratio	0.73	0.83	0.24	0.86	0.53	0.27	0.75	0.70		0.70	0.44	0.17
Uniform Delay, d1	23.2	38.6	31.3	30.1	33.5	30.6	25.4	36.6		31.0	38.4	35.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	9.1	5.9	0.3	19.5	0.5	0.3	7.1	4.0		8.2	1.7	1.1
Delay (s)	32.2	44.5	31.6	49.6	34.0	30.9	32.5	40.6		39.1	40.1	37.0
Level of Service	C	D	C	D	C	C	C	D		D	D	D
Approach Delay (s)		40.3			37.4			38.1			38.9	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	38.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	117.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	100.3%	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	27.5	7.3	24.4	14.7	11.4	3.2
Queue Length 95th (m)	15.2	111.5	55.5	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	847	5	144	810	129	72	389	278	384	367	104
v/c Ratio	0.03	0.56	0.01	0.81	0.54	0.17	0.16	0.23	0.35	0.86	0.22	0.13
Control Delay	21.0	27.9	0.0	65.5	27.4	4.1	19.1	19.0	15.4	49.0	18.9	5.4
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	21.0	27.9	0.0	65.5	27.4	4.1	19.1	19.0	15.4	49.0	18.9	5.4
Queue Length 50th (m)	0.9	82.1	0.0	30.8	77.4	0.0	9.9	29.1	29.7	82.5	27.2	2.2
Queue Length 95th (m)	3.7	102.5	0.0	#71.4	96.9	11.6	19.6	39.7	50.2	#145.7	37.6	11.9
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)	190	1504	688	177	1504	746	458	1681	792	445	1681	797
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	0.56	0.01	0.81	0.54	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	847	5	144	810	129	72	389	278	384	367	104
Future Volume (vph)	6	847	5	144	810	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	0.24	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)	450	3539	1583	418	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	847	5	144	810	129	72	389	278	384	367	104
RTOR Reduction (vph)	0	0	3	0	0	74	0	0	40	0	0	46
Lane Group Flow (vph)	6	847	2	144	810	55	72	389	238	384	367	58
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)	191	1504	672	177	1504	672	458	1681	751	445	1681	751
v/s Ratio Prot		0.24			0.23			0.11			0.10	
v/s Ratio Perm	0.01		0.00	c0.34		0.03	0.07		0.15	c0.41		0.04
v/c Ratio	0.03	0.56	0.00	0.81	0.54	0.08	0.16	0.23	0.32	0.86	0.22	0.08
Uniform Delay, d1	20.1	26.1	19.9	30.3	25.7	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	0.3	1.5	0.0	32.1	1.4	0.2	0.7	0.3	1.1	19.4	0.3	0.2
Delay (s)	20.4	27.6	19.9	62.4	27.1	20.8	18.6	18.9	20.6	47.4	18.7	17.4
Level of Service	C	C	B	E	C	C	B	B	C	D	B	B
Approach Delay (s)		27.5			31.1			19.5			31.5	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	27.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	83.4%	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)	57.7	106.8	110.9	94.5	88.8	22.4	32.2	16.8	64.4	74.2	77.3	93.5
Average Queue (m)	14.5	64.4	65.8	54.5	48.1	1.4	1.8	0.6	33.8	39.7	23.0	33.9
95th Queue (m)	38.6	101.9	102.5	87.8	74.7	11.1	15.2	7.1	54.4	60.7	52.1	67.0
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	3	0	0						0	
Queuing Penalty (veh)		12	13	1	1						0	
Storage Bay Dist (m)	70.0								65.0	65.0		
Storage Blk Time (%)		7							0	1	0	
Queuing Penalty (veh)		4							2	6	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)	96.5	33.3	61.2	90.7	47.4	191.0	147.2
Average Queue (m)	44.7	12.4	21.2	78.7	46.8	127.3	22.0
95th Queue (m)	80.1	27.0	44.5	109.5	49.9	223.7	89.5
Link Distance (m)	114.0		86.1	86.1		180.4	180.4
Upstream Blk Time (%)			0	42		29	0
Queuing Penalty (veh)			0	0		0	0
Storage Bay Dist (m)		20.0			40.0		
Storage Blk Time (%)		5	18		76	0	
Queuing Penalty (veh)		5	11		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)	119.4	121.6	121.2	116.1	62.5	118.8	66.0	61.6	70.8	307.5	357.4	353.7
Average Queue (m)	75.4	79.5	65.0	58.5	9.2	56.7	39.4	37.1	46.8	278.3	310.6	240.4
95th Queue (m)	121.6	125.0	117.7	102.3	35.4	96.9	59.5	53.6	65.3	375.2	425.5	463.6
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							58	28
Queuing Penalty (veh)	5	8	2	1							0	0
Storage Bay Dist (m)					45.0	135.0				300.0		
Storage Blk Time (%)				13		0				10	61	31
Queuing Penalty (veh)				24		0				34	205	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	192.0	191.3
Average Queue (m)	171.1	92.4	85.5
95th Queue (m)	394.6	220.4	212.8
Link Distance (m)		176.9	176.9
Upstream Blk Time (%)		22	18
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)	141.3	160.8	159.7	141.2	118.1	104.6	64.4	143.4	168.8	78.0	80.2	103.6
Average Queue (m)	76.1	79.8	52.4	41.4	43.9	65.2	42.6	48.2	108.7	48.8	48.5	65.4
95th Queue (m)	126.9	133.3	121.7	98.3	92.3	91.6	61.5	86.7	155.2	72.2	71.7	93.5
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	0								
Queuing Penalty (veh)		1	1	0								
Storage Bay Dist (m)	130.0								130.0	265.0		
Storage Blk Time (%)	1	1							8			
Queuing Penalty (veh)	2	3							48			

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

Movement	NB
Directions Served	R
Maximum Queue (m)	91.5
Average Queue (m)	49.5
95th Queue (m)	83.1
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)	131.6	150.6	174.6	134.8	140.4	14.8	57.3	129.2	135.6	144.6	164.4	57.4
Average Queue (m)	82.2	88.0	94.9	72.4	79.7	4.4	17.2	67.9	106.0	127.8	113.3	55.0
95th Queue (m)	144.6	152.6	167.4	121.5	129.3	11.6	46.6	113.2	145.4	152.6	216.2	65.4
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)			0					0	0	8	13	
Queuing Penalty (veh)			0					1	1	43	67	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)	2	3	1		0		0	16				9
Queuing Penalty (veh)	14	20	3		0		2	12				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)	137.7	133.3	67.1	100.6	100.6
Average Queue (m)	131.7	82.2	40.9	56.2	100.6
95th Queue (m)	145.6	175.5	68.2	127.8	100.6
Link Distance (m)	128.7	128.7		96.0	96.0
Upstream Blk Time (%)	62	14		11	92
Queuing Penalty (veh)	0	0		0	0
Storage Bay Dist (m)			60.0		
Storage Blk Time (%)	64		9		
Queuing Penalty (veh)	223		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)	82.4	94.8	119.3	57.0	58.9	34.1	22.9	248.0	255.6	259.3	76.4	88.2
Average Queue (m)	68.3	72.9	40.5	35.6	37.6	12.6	6.9	135.9	242.4	250.9	34.2	49.2
95th Queue (m)	89.6	97.5	90.5	56.5	55.1	27.3	17.6	281.8	294.0	256.2	68.4	80.3
Link Distance (m)			131.2	131.2	131.2			244.4	244.4	244.4		
Upstream Blk Time (%)			0					3	44	95		
Queuing Penalty (veh)			3					0	0	0		
Storage Bay Dist (m)	70.0	70.0				50.0	120.0				95.0	95.0
Storage Blk Time (%)	11	24	0		3			0			0	0
Queuing Penalty (veh)	53	114	0		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)	61.7	62.0	119.7	216.0	213.8	80.0
Average Queue (m)	32.2	29.7	109.6	154.9	92.1	63.7
95th Queue (m)	53.7	52.3	139.2	279.2	218.4	96.5
Link Distance (m)	218.2	218.2		214.5	214.5	
Upstream Blk Time (%)				20	0	
Queuing Penalty (veh)				110	2	
Storage Bay Dist (m)			110.0			45.0
Storage Blk Time (%)			62	2	0	31
Queuing Penalty (veh)			52	9	1	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)	55.5	73.9	46.2	11.6	53.4	79.3	79.9	47.5	166.5	180.2
Average Queue (m)	29.6	24.1	10.9	3.5	18.9	32.5	34.7	6.0	67.6	91.6
95th Queue (m)	49.6	54.6	31.3	10.9	38.8	71.9	74.0	30.6	161.5	182.4
Link Distance (m)	126.0	126.0	60.2	60.2		214.5	214.5		195.2	195.2
Upstream Blk Time (%)			0						3	2
Queuing Penalty (veh)			0						17	13
Storage Bay Dist (m)					70.0			50.0		
Storage Blk Time (%)					0	1		0	25	
Queuing Penalty (veh)					0	1		0	3	

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)	41.4	26.0	43.0	3.4	29.1	54.7	56.7	117.8	150.5
Average Queue (m)	24.5	2.0	17.5	0.3	10.0	18.4	20.4	42.4	63.9
95th Queue (m)	39.5	18.1	33.7	2.5	22.2	44.1	46.1	98.2	127.7
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		2	
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)	38.8	19.1	24.0	31.2	20.5	57.7	105.4	100.8	59.1	101.4	126.3
Average Queue (m)	16.8	4.6	8.7	13.3	5.3	11.1	57.3	58.2	18.4	65.3	84.2
95th Queue (m)	31.6	14.4	18.5	26.3	15.1	33.1	93.8	92.7	44.3	96.2	118.4
Link Distance (m)		140.4			212.1		247.7	247.7		206.7	206.7
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (m)	50.0		50.0	30.0		70.0			65.0		
Storage Blk Time (%)	0			2	0		3		0	3	
Queuing Penalty (veh)	0			1	0		2		0	3	

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

Movement	WB	NB	NB	SB	SB
Directions Served	LR	T	TR	L	T
Maximum Queue (m)	52.5	5.0	3.0	9.1	3.6
Average Queue (m)	21.9	0.2	0.1	1.0	0.1
95th Queue (m)	44.4	2.8	2.1	5.7	1.8
Link Distance (m)	182.2	206.7	206.7		208.0
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)				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)	29.4	26.1	16.7	27.6	14.9	1.4
Average Queue (m)	12.0	12.8	5.9	5.0	2.0	0.1
95th Queue (m)	25.7	21.2	15.1	39.6	18.5	1.3
Link Distance (m)	102.1	102.1		208.0	208.0	137.8
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			15.0			
Storage Blk Time (%)			1	3		
Queuing Penalty (veh)			4	1		

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

Movement	EB	NB	NB	NB
Directions Served	LR	L	T	T
Maximum Queue (m)	84.9	17.0	102.4	96.7
Average Queue (m)	34.3	1.5	34.7	24.6
95th Queue (m)	84.4	8.4	107.8	90.1
Link Distance (m)	108.5		137.8	137.8
Upstream Blk Time (%)	4		2	0
Queuing Penalty (veh)	0		9	1
Storage Bay Dist (m)		15.0		
Storage Blk Time (%)		0	22	
Queuing Penalty (veh)		0	2	

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	207.6	202.4	75.0	90.9	114.2	95.1	74.9	92.2	109.7	98.4	82.2
Average Queue (m)	63.6	119.3	115.3	48.8	54.4	58.6	49.2	19.3	76.2	87.3	76.2	49.2
95th Queue (m)	93.4	199.8	193.1	96.0	90.4	94.1	75.4	45.4	106.7	118.2	112.5	95.7
Link Distance (m)		835.5	835.5			287.9	287.9			92.4	92.4	
Upstream Blk Time (%)									6	22	13	8
Queuing Penalty (veh)									0	121	68	0
Storage Bay Dist (m)	25.0			25.0	40.0			25.0	100.0			40.0
Storage Blk Time (%)	48	59	63	4	33	20	31	1	6	22		32
Queuing Penalty (veh)	206	130	126	18	96	59	72	4	16	74		58

Intersection: 33: Bayview Drive & Big Bay Point Road

Movement	SB	SB	SB	B37
Directions Served	T	T	R	T
Maximum Queue (m)	93.0	84.0	66.9	12.1
Average Queue (m)	52.9	42.5	27.8	6.7
95th Queue (m)	106.4	85.4	53.4	34.2
Link Distance (m)	101.3	101.3		41.5
Upstream Blk Time (%)	9	0		7
Queuing Penalty (veh)	0	0		0
Storage Bay Dist (m)			50.0	
Storage Blk Time (%)	9	2	2	
Queuing Penalty (veh)	15	6	3	

Intersection: 37: Bend

Movement	NB	NB
Directions Served	T	
Maximum Queue (m)	24.8	23.9
Average Queue (m)	0.8	0.8
95th Queue (m)	15.9	15.1
Link Distance (m)	101.3	101.3
Upstream Blk Time (%)	0	0
Queuing Penalty (veh)	0	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)	55.0	92.0	98.9	95.6	56.2	61.9	47.2	18.5	1.7	40.4	36.8	100.7
Average Queue (m)	20.0	52.9	61.6	52.0	35.3	9.9	9.6	5.7	0.1	18.6	17.1	42.9
95th Queue (m)	43.8	83.2	92.8	82.5	57.6	35.6	25.7	16.0	1.2	34.7	31.6	78.7
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	0					1
Queuing Penalty (veh)						2	0					0
Storage Bay Dist (m)	60.0				50.0					45.0		
Storage Blk Time (%)	0	4			6	0				0	0	
Queuing Penalty (veh)	0	5			26	1				0	0	

Intersection: 39: Bryne Drive & Mapleview Drive W

Movement	B42	SB	SB	SB
Directions Served	T	L	T	TR
Maximum Queue (m)	8.7	32.1	19.2	11.8
Average Queue (m)	0.3	11.6	6.5	4.1
95th Queue (m)	4.9	24.5	16.4	11.1
Link Distance (m)	42.8		172.2	172.2
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (m)		50.0		
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)	25.8	99.4	95.0	9.0	80.0	242.0	238.7	55.6	35.4	55.1	42.8	54.4
Average Queue (m)	2.2	66.4	57.8	1.2	73.8	151.1	134.1	11.5	15.1	33.2	20.8	23.8
95th Queue (m)	14.4	92.4	85.4	6.0	95.3	284.3	268.8	31.9	29.3	48.3	39.0	44.9
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 (%)		13	5		81	1	3			0		0
Queuing Penalty (veh)		1	0		327	1	3			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	166.7	149.0	50.2
Average Queue (m)	79.4	151.4	94.8	13.0
95th Queue (m)	84.7	190.7	172.5	31.7
Link Distance (m)		149.6	149.6	
Upstream Blk Time (%)		91	0	
Queuing Penalty (veh)		0	0	
Storage Bay Dist (m)	60.0			60.0
Storage Blk Time (%)	91	0	2	
Queuing Penalty (veh)	167	0	2	

Network Summary

Network wide Queuing Penalty: 2899

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	683	2133	1899	1061	495	565
v/c Ratio	0.90	0.61	0.84	0.67	0.69	0.92
Control Delay	41.3	11.7	23.1	4.7	53.2	66.0
Queue Delay	0.0	2.5	0.0	0.0	0.5	0.0
Total Delay	41.3	14.1	23.1	4.7	53.6	66.0
Queue Length 50th (m)	71.7	171.4	96.4	27.8	63.6	76.7
Queue Length 95th (m)	m#99.5	183.3	m101.4	m32.2	83.0	#112.5
Internal Link Dist (m)		168.8	225.6			
Turn Bay Length (m)	130.0			130.0	265.0	265.0
Base Capacity (vph)	792	3522	2274	1583	739	634
Starvation Cap Reductn	0	1219	0	0	0	0
Spillback Cap Reductn	0	0	10	0	48	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.93	0.84	0.67	0.72	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	2133	0	0	1899	1061	495	0	565	0	0	0
Future Volume (vph)	683	2133	0	0	1899	1061	495	0	565	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	1899	1061	495	0	565	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	1899	1061	495	0	518	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	90.9			58.1	130.0	27.1		27.1			
Effective Green, g (s)	28.8	90.9			58.1	130.0	27.1		27.1			
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	3521			2272	1583	715		569			
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		0.91			
Uniform Delay, d1	49.2	10.2			31.7	0.0	47.6		50.3			
Progression Factor	0.64	1.08			0.68	1.00	1.00		1.00			
Incremental Delay, d2	7.7	0.4			1.1	0.6	2.9		18.8			
Delay (s)	39.3	11.4			22.5	0.6	50.5		69.1			
Level of Service	D	B			C	A	D		E			
Approach Delay (s)		18.2			14.7			60.4			0.0	
Approach LOS		B			B			E			A	

Intersection Summary

HCM 2000 Control Delay	23.2	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	89.2%	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	1892	70	72	1777	256	693	91	227	50	492
v/c Ratio	0.94	0.88	0.09	0.45	1.01	0.39	0.96	0.24	0.85	0.18	0.86
Control Delay	87.0	22.3	0.4	28.2	47.5	4.2	76.5	38.1	81.9	49.5	51.5
Queue Delay	0.0	0.0	0.0	0.0	6.5	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.0	22.3	0.4	28.2	54.0	4.2	76.5	38.1	81.9	49.5	51.5
Queue Length 50th (m)	~56.9	178.5	0.2	6.4	~186.3	2.9	96.2	17.4	59.7	11.8	108.0
Queue Length 95th (m)	m#90.2	#214.2	m0.7	m9.3	#213.3	m6.6	#135.4	33.6	#100.1	24.3	#171.0
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)	444	2154	749	163	1754	652	720	381	284	299	569
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	0.94	0.88	0.09	0.44	1.03	0.39	0.96	0.24	0.80	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	1892	70	72	1777	256	693	65	26	227	50	492
Future Volume (vph)	417	1892	70	72	1777	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	0.09	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	4940	1578	166	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	1892	70	72	1777	256	693	65	26	227	50	492
RTOR Reduction (vph)	0	0	40	0	0	120	0	11	0	0	0	55
Lane Group Flow (vph)	417	1892	30	72	1777	136	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)	16.5	55.9	55.9	51.2	45.3	45.3	27.0	27.0		19.2	19.2	35.7
Effective Green, g (s)	16.5	55.9	55.9	51.2	45.3	45.3	27.0	27.0		19.2	19.2	35.7
Actuated g/C Ratio	0.13	0.43	0.43	0.39	0.35	0.35	0.21	0.21		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)	444	2124	678	138	1754	532	720	370		266	280	443
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	0.18		0.09						0.15
v/c Ratio	0.94	0.89	0.04	0.52	1.01	0.26	0.96	0.22		0.85	0.18	0.99
Uniform Delay, d1	56.3	34.2	21.5	28.9	42.4	30.3	51.0	42.7		54.0	48.5	46.9
Progression Factor	1.13	0.51	0.24	1.32	0.65	0.34	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	24.5	4.7	0.1	2.0	19.3	0.6	24.5	0.3		22.4	0.3	38.8
Delay (s)	87.9	22.0	5.2	40.0	46.7	11.1	75.5	43.0		76.4	48.8	85.7
Level of Service	F	C	A	D	D	B	E	D		E	D	F
Approach Delay (s)		33.1			42.1			71.7			80.5	
Approach LOS		C			D			E			F	

Intersection Summary

HCM 2000 Control Delay	47.3	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	97.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	590	1415	142	55	1292	223	226	312	358	171	588
v/c Ratio	0.93	0.57	0.20	0.28	0.76	0.37	0.85	0.45	0.94	0.20	0.96
Control Delay	84.3	20.2	6.0	19.4	43.0	7.3	86.5	38.5	67.8	38.6	50.8
Queue Delay	0.0	0.2	0.0	0.0	2.7	0.0	0.0	0.0	0.0	0.0	2.3
Total Delay	84.3	20.4	6.0	19.4	45.7	7.3	86.5	38.5	67.8	38.6	53.1
Queue Length 50th (m)	87.8	60.5	4.4	6.7	117.3	2.6	31.5	30.8	73.7	18.6	81.2
Queue Length 95th (m)	m#110.6	73.1	m8.2	13.5	136.4	22.4	#53.9	45.5	#131.6	28.6	#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)	633	2470	728	203	1693	596	266	782	382	962	640
Starvation Cap Reductn	0	298	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	280	0	0	0	0	0	16
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.65	0.20	0.27	0.91	0.37	0.85	0.40	0.94	0.18	0.94

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)	590	1415	142	55	1292	223	226	211	101	358	171	588
Future Volume (vph)	590	1415	142	55	1292	223	226	211	101	358	171	588
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	0.97	0.91	1.00	1.00	0.91	1.00	0.97	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	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	0.95		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)	3303	5085	1367	1703	5085	1373	3467	3308		1686	3574	1524
Flt Permitted	0.95	1.00	1.00	0.17	1.00	1.00	0.95	1.00		0.40	1.00	1.00
Satd. Flow (perm)	3303	5085	1367	301	5085	1373	3467	3308		715	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)	590	1415	142	55	1292	223	226	211	101	358	171	588
RTOR Reduction (vph)	0	0	66	0	0	139	0	46	0	0	0	238
Lane Group Flow (vph)	590	1415	76	55	1292	84	226	266	0	358	171	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	Perm	Prot	NA		pm+pt	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2	6		6				4		4
Actuated Green, G (s)	24.9	62.3	62.3	49.2	43.3	43.3	10.0	25.8		45.8	31.8	31.8
Effective Green, g (s)	24.9	62.3	62.3	49.2	43.3	43.3	10.0	25.8		45.8	31.8	31.8
Actuated g/C Ratio	0.19	0.48	0.48	0.38	0.33	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	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)	632	2436	655	177	1693	457	266	656		371	874	372
v/s Ratio Prot	c0.18	0.28		0.01	c0.25		0.07	0.08		c0.12	0.05	
v/s Ratio Perm			0.06	0.10		0.06				c0.22		0.23
v/c Ratio	0.93	0.58	0.12	0.31	0.76	0.18	0.85	0.41		0.96	0.20	0.94
Uniform Delay, d1	51.7	24.4	18.7	26.0	38.8	30.8	59.3	45.4		38.3	39.0	48.2
Progression Factor	1.40	0.78	1.17	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	12.1	0.5	0.2	1.0	3.3	0.9	21.6	0.4		37.2	0.1	31.8
Delay (s)	84.7	19.6	22.0	27.0	42.1	31.7	80.8	45.8		75.5	39.1	79.9
Level of Service	F	B	C	C	D	C	F	D		E	D	E
Approach Delay (s)		37.6			40.1			60.5			72.3	
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	0.91		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	87.9%	ICU Level of Service	E
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)	91.5	114.0	130.9	119.2	94.8	159.8	109.6	82.4	80.1	84.4	82.9	114.7
Average Queue (m)	49.9	48.8	22.8	19.0	21.4	89.9	56.6	53.7	46.0	51.2	51.9	68.7
95th Queue (m)	80.1	85.1	76.7	66.2	60.7	138.5	90.3	76.4	77.0	76.4	78.2	102.1
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	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)	102.5
Average Queue (m)	52.2
95th Queue (m)	88.0
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)	109.4	111.4	127.2	97.8	111.9	14.4	57.3	136.7	137.1	146.7	164.4	57.4
Average Queue (m)	54.4	59.5	63.9	52.7	61.2	3.7	19.3	75.1	100.4	123.1	104.9	55.2
95th Queue (m)	100.4	104.1	107.3	87.0	95.7	10.9	50.8	131.5	152.6	164.7	213.2	65.9
Link Distance (m)			218.3	218.3	218.3			131.2	131.2	131.2	131.2	
Upstream Blk Time (%)								0	0	9	11	
Queuing Penalty (veh)								2	2	49	56	
Storage Bay Dist (m)	160.0	160.0				175.0	50.0					50.0
Storage Blk Time (%)	0	0					0	22				14
Queuing Penalty (veh)	0	1					1	16				47

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	134.6	67.2	100.6	100.6
Average Queue (m)	133.5	99.1	50.2	49.0	93.6
95th Queue (m)	135.7	182.7	73.6	117.1	119.3
Link Distance (m)	128.7	128.7		96.0	96.0
Upstream Blk Time (%)	79	24		7	54
Queuing Penalty (veh)	0	0		0	0
Storage Bay Dist (m)			60.0		
Storage Blk Time (%)	72		17	0	
Queuing Penalty (veh)	248		8	1	

Intersection: 15: Bayview Drive & 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)	82.4	94.8	131.2	77.9	67.3	49.6	38.0	247.7	251.0	258.0	258.9	83.7
Average Queue (m)	68.1	73.7	40.6	34.7	33.8	13.6	8.4	145.9	235.2	249.0	239.4	40.2
95th Queue (m)	91.2	100.9	103.1	61.2	57.3	33.1	24.1	277.5	297.6	257.1	314.0	83.7
Link Distance (m)			131.2	131.2	131.2			244.0	244.0	244.0	244.0	
Upstream Blk Time (%)			1					2	26	87	53	
Queuing Penalty (veh)			4					0	0	0	0	
Storage Bay Dist (m)	70.0	70.0				50.0	120.0					95.0
Storage Blk Time (%)	13	25	0		3	0		3				0
Queuing Penalty (veh)	63	118	1		4	0		1				0

Intersection: 15: Bayview Drive & Mapleview Drive W

Movement	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	T	TR	L	T	T	R
Maximum Queue (m)	92.2	71.4	54.0	117.5	216.7	216.5	80.0
Average Queue (m)	57.2	32.4	29.7	115.6	184.4	90.5	58.4
95th Queue (m)	92.8	57.0	51.3	127.1	281.0	218.3	96.2
Link Distance (m)		218.2	218.2		211.7	211.7	
Upstream Blk Time (%)					26	0	
Queuing Penalty (veh)					145	1	
Storage Bay Dist (m)	95.0			110.0			45.0
Storage Blk Time (%)	3	0		79	4	0	25
Queuing Penalty (veh)	3	0		67	14	1	21

Zone Summary

Zone wide Queuing Penalty: 878

HCM Signalized Intersection Capacity Analysis
1: West Terminal

05-17-2022

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					0.68			1.00				
Incremental Delay, d2					3.1			3.8				
Delay (s)					26.0			34.5				
Level of Service					C			C				
Approach Delay (s)		0.0			26.0			34.5			0.0	
Approach LOS		A			C			C			A	

Intersection Summary			
HCM 2000 Control Delay	30.4	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

05-17-2022

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

05-17-2022

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	1899	0
Future Volume (vph)	0	2133	0	0	0	0	0	0	0	0	1899	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	1899	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	1899	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									32.3	
Progression Factor		0.70									1.00	
Incremental Delay, d2		3.3									3.9	
Delay (s)		25.4									36.3	
Level of Service		C									D	
Approach Delay (s)		25.4			0.0			0.0			36.3	
Approach LOS		C			A			A			D	

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	87.9%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
4: West Terminal/E-S

05-17-2022

Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Traffic Volume (veh/h)	0	0	461	1933	0	0
Future Volume (Veh/h)	0	0	461	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	461	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		1566	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			0		82	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		434	1091

Direction, Lane #	WB 1	WB 2	WB 3
Volume Total	848	773	773
Volume Left	461	0	0
Volume Right	0	0	0
cSH	1607	1700	1700
Volume to Capacity	0.29	0.45	0.45
Queue Length 95th (m)	9.1	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	65.1%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
5: W-S

05-17-2022

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

05-17-2022

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

05-17-2022

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Traffic Volume (veh/h)	0	0	1899	1061	0	0
Future Volume (Veh/h)	0	0	1899	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	1899	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	2960				1899	633
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2960				1899	633
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)	122				62	427

Direction, Lane #	WB 1	WB 2	WB 3	WB 4
Volume Total	633	633	633	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	87.9%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
14: S-E

05-17-2022

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	2133	0	0	0	0	565
Future Volume (vph)	2133	0	0	0	0	565
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	565
RTOR Reduction (vph)	0	0	0	0	0	2
Lane Group Flow (vph)	2133	0	0	0	0	563
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						c0.20
v/c Ratio	0.88					0.47
Uniform Delay, d1	30.6					26.4
Progression Factor	0.00					1.00
Incremental Delay, d2	2.3					1.3
Delay (s)	2.3					27.8
Level of Service	A					C
Approach Delay (s)	2.3			0.0	27.8	
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	87.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
16: W-N/East Terminal

05-17-2022

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

05-17-2022

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	0	0	0	1899	495	0
Future Volume (vph)	0	0	0	1899	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	1899	495	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	1899	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				33.4	20.7	
Progression Factor				0.02	1.00	
Incremental Delay, d2				2.4	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	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.1%	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)	47.6	52.1	50.5	32.8	39.0	40.7
Average Queue (m)	41.7	45.9	45.0	29.8	29.6	30.1
95th Queue (m)	50.7	48.3	49.5	31.8	35.8	36.5
Link Distance (m)	18.6	18.6	18.6	25.6	25.6	25.6
Upstream Blk Time (%)	45	58	57	57	38	48
Queuing Penalty (veh)	293	374	370	404	271	343
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)	34.4	30.0	34.5	66.7	61.0
Average Queue (m)	22.5	9.2	12.8	56.0	43.2
95th Queue (m)	34.2	24.9	27.3	66.3	59.9
Link Distance (m)	22.8	22.8	22.8	37.0	37.0
Upstream Blk Time (%)	7	3	6	29	14
Queuing Penalty (veh)	51	22	43	98	48
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)	67.3	65.3	68.9	46.3	40.9	44.5
Average Queue (m)	58.7	57.4	56.3	36.4	36.6	36.3
95th Queue (m)	63.6	63.6	66.4	40.8	39.0	45.1
Link Distance (m)	27.3	27.3	27.3	19.8	19.8	19.8
Upstream Blk Time (%)	41	45	49	65	59	50
Queuing Penalty (veh)	290	322	351	410	374	319
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	77.3	79.8
Average Queue (m)	58.8	55.9	52.9
95th Queue (m)	79.2	80.5	81.7
Link Distance (m)	59.5	59.5	59.5
Upstream Blk Time (%)	27	16	17
Queuing Penalty (veh)	212	130	140
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)	191.9	191.6	186.0	184.6
Average Queue (m)	183.1	182.6	166.9	83.2
95th Queue (m)	188.2	187.4	203.5	227.6
Link Distance (m)	176.8	176.8	176.8	176.8
Upstream Blk Time (%)	86	66	13	6
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)	9.2	21.4	23.8	49.8	36.8
Average Queue (m)	1.5	11.8	12.0	28.5	15.5
95th Queue (m)	6.7	20.2	21.8	45.6	36.4
Link Distance (m)	7.7	7.7	7.7	37.4	37.4
Upstream Blk Time (%)	7	48	46	2	0
Queuing Penalty (veh)	45	311	299	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)	201.0	198.3	195.3	159.8
Average Queue (m)	177.1	167.0	128.3	56.1
95th Queue (m)	221.4	220.4	215.2	199.9
Link Distance (m)	187.5	187.5	187.5	187.5
Upstream Blk Time (%)	28	15	8	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)	7.5	13.4	18.3	70.9	56.4
Average Queue (m)	0.4	2.6	8.4	51.4	38.2
95th Queue (m)	3.5	9.3	16.7	73.4	58.9
Link Distance (m)	20.9	20.9	20.9	48.7	48.7
Upstream Blk Time (%)		0	1	11	1
Queuing Penalty (veh)		3	5	30	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)	76.0	78.0	77.3
Average Queue (m)	50.7	40.4	33.6
95th Queue (m)	78.0	75.4	72.9
Link Distance (m)	54.6	54.6	54.6
Upstream Blk Time (%)	7	3	3
Queuing Penalty (veh)	67	31	26
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)	40.7	38.2	36.3	63.8	60.8
Average Queue (m)	22.7	22.1	20.0	55.3	39.6
95th Queue (m)	39.1	41.0	41.0	71.0	58.8
Link Distance (m)	31.8	31.8	31.8	39.6	39.6
Upstream Blk Time (%)	2	2	2	47	13
Queuing Penalty (veh)	10	13	10	117	32
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Zone Summary

Zone wide Queuing Penalty: 5873

Appendix H

2036 Total 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

Queues
2036 Future Total - AM Peak Hour - DDI

1: West Terminal-E-S

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

HCM Signalized Intersection Capacity Analysis
2036 Future Total - AM Peak Hour - DDI

1: West Terminal-E-S

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