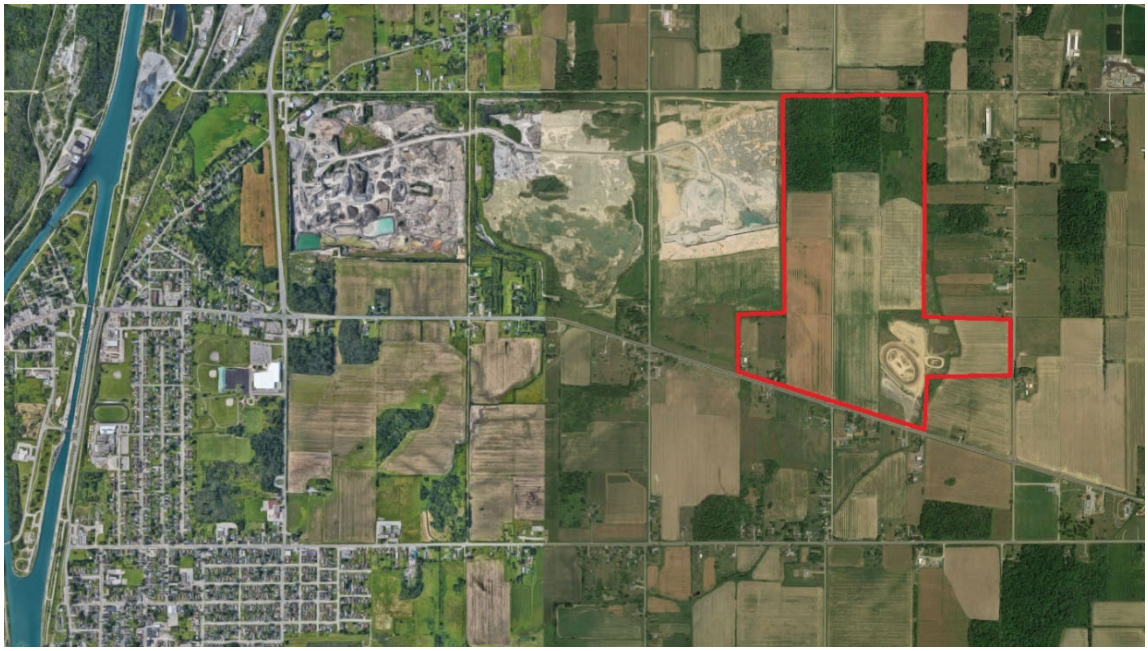
Traffic Impact Study

Port Colborne Quarries Pit 3 Expansion



Prepared for Port Colborne Quarries Inc.
by IBI Group
October 19, 2020

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Executive Summary

IBI Group (IBI) was retained by Port Colborne Quarries Inc. to complete a Traffic Impact Study (TIS) in support of a Site Plan amendment application for the proposed expansion of Pit 3 and the establishment of a new quarry access on Highway 3. The site is located to the northeast of Port Colborne and is bounded by Second Concession Road to the north, Highway 3 to the south, Miller Road (Regional Road 84) to the east and Highway 140 to west.

This study has been prepared in accordance with the Ontario Ministry of Transportation (MTO) General Guidelines for the Preparation of Traffic Impact Studies (December 2009).

Proposed Development Characteristics

- The proposed Pit 3 expansion will consist of a 106.3-hectare expansion to Pit 3 and will be operational by 2031.
- A new access will be constructed on Highway 3 at Carl Road / Weaver Road by 2034 to allow trucks loading at the Pit 3 expansion to exit the site. The existing Ramey Road access will continue to be used by incoming truck traffic to backfill Pit 1, and as the site access/egress for employees.
- Pit 1 is expected to be fully backfilled by 2039, after which point all trucks will enter and exit the site exclusively via the Highway 3 access.
- Employee parking will remain at its current location in the northwest corner of the site, accessed via the existing Ramey Road access, which intersects Second Concession Road.

Transportation Facilities Analysis

- Based on discussions with staff from City of Port Colborne, Niagara Region, and the Ministry of Transportation of Ontario (MTO), there are no roadway modifications within the study area that are projected to occur within the horizon of this study.

Background Traffic

- A 2% background growth rate was applied to the existing traffic counts to estimate the 2031, 2036, and 2041 background peak hour traffic volumes.
- Two future adjacent developments were identified: the Olde Humberstone Village Subdivision and the Port Colborne Energy Park. Since both developments are outside the study area, the traffic generated by these sites are considered in the background traffic growth rate.

Proposed Development Traffic Generation

- A ‘first-principles’ approach was used to estimate the volume of truck traffic generated by the site. Based on the average annual quarry extraction volume, it was estimated that the site would generate an average of 15.4 truck trips per hour distributed evenly throughout the day. For the purposes of analysis in the Synchro traffic model, these truck trips were

converted into equivalent passenger car trips, yielding the equivalent of 31 passenger car trips per hour.

- The number of staff employed by Port Colborne Quarries is expected to remain the same through to the 2041 study horizon therefore the traffic generated by employees arriving and leaving the site has already been captured in the existing traffic counts.

- Trucking activities begin around 6:00 am and end around 4:00 pm. During the morning peak hour, the site is expected to generate 31 two-way (i.e. inbound and outbound) equivalent passenger car trips. As trucking activities end before the afternoon peak hour, the site is expected to generate only automobile trips during that period with no net increase expected as a result of the quarry expansion.

- Three different distributions were developed, one for each analysis year, based on trip distributions provided by Port Colborne Quarries staff. The trip distribution differs for each analysis year to reflect changes over time to on-site operations.

- Site-generated traffic was assigned to the adjacent road network along logical routes and combined with background traffic volumes to estimate the 2031, 2036 and 2041 future total peak hour traffic volumes.

Operational Analysis

- The results of the intersection capacity analyses indicate that all of the study area intersections are expected to operate at an acceptable Level of Service (LOS ‘D’ or better, and v/c < 0.85) within the 2041 horizon year of this study.

Scenario 2 Operational Analysis (Welland Canal Dock)

- Port Colborne Quarries staff indicated that several times a year, 50 trucks per day are sent to the dock on the Welland Canal at the western terminus of Second Concession Road over a three-day period. This volume of truck traffic represents approximately a third of the total daily truck traffic generated by the site.
- Scenario 2 site-generated traffic volumes were estimated by assigning 1/3 of truck trips to travel to/from the Welland Canal and the remaining 2/3 of truck trips following the normal trip distribution.
- Scenario 2 was analysed under 2041 future total traffic conditions. Based on the results of the intersection capacity analysis, it is not expected that any of the study area intersections will experience capacity issues as a result of the redirected trips.

Geometric Analysis

- A preliminary desktop review of sightlines at the proposed Highway 3 access based on Google Streetview imagery concluded that there are no horizontal or vertical curves on Highway 3 that would impact vehicle line of sight. Proper care should be taken to ensure no obstructions be placed in the line-of-sight in the vicinity of the proposed Highway 3 access.
- The auxiliary lane analysis identified that under 2041 future total traffic conditions, the following vehicular storage deficiency may be expected:

  - Based on the projected traffic volumes, a new eastbound left-turn lane of at least 35 metres in length (plus taper) will be required at the proposed Highway 3 access by 2039 when Pit 1 is fully backfilled. The geometric requirements shall be confirmed prior to implementation.
  - The southbound right-turn taper at the Highway 130 & Second Concession Road intersection was found to be deficient and may need to be extended to provide sufficient deceleration length. It should be noted that this deficiency is an existing condition and site-generated traffic is not anticipated to contribute additional traffic to this movement. This is for information purposes only and shall not be considered a condition of the proposed development.
- The above auxiliary lane lengths requirements do not include the taper length.
- None of the unsignalized intersections analysed, including the new proposed site access, warrant a new right-turn lane.

Conclusion

The overall conclusion of this Traffic Impact Study is that the traffic generated by the proposed Port Colborne Quarries Pit 3 expansion can be safely accommodated on the adjacent road network with consideration of the above recommendations.

1 Introduction

IBI Group (IBI) was retained by Port Colborne Quarries Inc. to complete a Traffic Impact Study (TIS) in support of a Site Plan amendment application for the proposed expansion of Pit 3 and the establishment of a new quarry access on Highway 3 at Carl Road / Weaver Road. The area is currently mostly undeveloped with the exception of some single-family homes and the New Humberstone Speedway.

This study has been prepared in accordance with the Ontario Ministry of Transportation (MTO) General Guidelines for the Preparation of Traffic Impact Studies (December 2009).

1.1 Scope

Based on the TIS guidelines, the key objectives of this study are as follows:

- Determine the impact of the proposed development on the adjacent road network;
- Recommend appropriate measures/ strategies/ modifications to ensure that the adjacent road network can accommodate the traffic generated by the proposed development; and
- Assess the need for geometric improvements to the adjacent road network.

MTO staff have confirmed the following study parameters and assumptions:

- Study area limits;
- Analysis years and periods; and
- Background traffic growth rates.

2 Study Area

The proposed Pit 3 expansion is 106.3 hectares in size and is located to the northeast of Port Colborne. The site is bound by Second Concession Road to the north, Highway 3 to the south, rural residences on Miller Road to the east and the existing portion of Pit 3 to the west. The following study area intersections were confirmed with MTO staff:

- Second Concession Road / Barber Drive / Canal Road;
- Highway 140 / Second Concession Road;
- Second Concession Road / Ramey Road;
- Second Concession Road / Miller Road (Regional Road 84);
- Highway 140 / Highway 3;
- Highway 3 / Miller Road (Regional Road 84);

The site location and the study area intersections are illustrated in **Exhibit 2-1**.

IBI

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EXHIBIT 2-1: Study Area

PROJECT No. 115774
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SCALE: 0m 250m 500m

3 Proposed Development

3.1 Land Uses

The proposed development will consist of a 106.3-hectare expansion to Pit 3 of the Port Colborne Quarries and is expected to be operational by 2031. The types of quarry operations that will occur in the Pit 3 expansion will include extraction, processing, and loading operations. It is anticipated that Port Colborne Quarries will continue to employ approximately 17 employees through to the 2041 study horizon. Employees shifts are 7:00 am to 5:00 pm and 3:00 pm to 11:00 pm, 5 days a week with additional Saturday shifts during the peak season.

3.2 Site Access

Initially, site ingress and egress will continue to occur at the existing Ramey Road access. A new access will be constructed on Highway 3 at Carl Road / Weaver Road by 2034 to allow trucks loading at the Pit 3 expansion to exit the site. The existing Ramey Road access will continue to be used by incoming truck traffic to backfill Pit 1, and as the site access/egress for employees.

3.3 Parking

Employee parking is located in the northwest corner of the Port Colborne Quarries site near the site office. It is expected that employee parking will remain at its current location and in its current configuration through to the 2041 horizon. Therefore, the employee parking lot will continue being accessed via the Ramey Road Access (via Second Concession Road).

3.4 Phasing

It is anticipated that extraction, processing, and loading operations in the Pit 3 expansion will begin by 2031 and will continue through to the 2041 horizon. As discussed previously, the new Highway 3 access is expected to be constructed by 2034, at which point the existing processing plant located in Pit 1 will be decommissioned and a new processing plant will be constructed in Pit 3.

It is projected that the backfilling of Pit 1 will be completed by 2039. Until 2039, all Ramey Road access inbound trucks are expected to carry in clean fill loads for the backfilling of Pit 1, traverse the site internally, and exit via the Highway 3 access carrying a new load from the subject site's quarries. After Pit 1 has been fully backfilled, all inbound trucks will then enter via the Highway 3 access.

4 Existing Conditions

4.1 Existing Road Network

Highway 140 is a provincial highway under the jurisdiction of the Ontario Ministry of Transportation (MTO). Highway 140 runs north-south from Port Colborne to Welland, has a 2-lane cross-section and a posted speed limit of 80 km/h, reducing to 60 km/h approximately 260m north of Highway 3.

Highway 3 is a provincial highway primarily under the jurisdiction of MTO however some segments are under municipal jurisdiction. Highway 3 runs east-west from Windsor to Fort Erie and has a 2-lane cross-section. Within the study area, the speed limit along Highway 3 changes at several points: west of Highway 140 the posted speed limit is 50 km/h, between Highway 140

and Snider Road the posted speed limit is 70 km/h and east of Snider Road the posted speed limit is 80 km/h.

Miller Road (Regional Road 84) is a regional road under the jurisdiction of Niagara Region that runs north-south from Chippawa Creek Road (Regional Road 64) in the north to Killaly Street East in the south. Miller Road has a 2-lane rural cross-section and a posted speed limit of 80 km/h. It shall be noted that there are seasonal load restrictions in place from March 1 to April 31.

Elizabeth Street is a 2-lane arterial road under the jurisdiction of the City of Port Colborne. Elizabeth Street runs north-south from the terminus of Highway 140 at Highway 3 to Colborne Street and has a posted speed limit of 50 km/h.

Second Concession Road is a 2-lane collector road under the jurisdiction of the City of Port Colborne. Second Concession Road runs east-west from the Welland Canal to Holloway Bay Road North and has a posted speed limit of 50 km/h west of Highway 140, 60 km/h between Highway 140 and Babion Road, and 80 km/h east of Babion Road. It shall be noted that there are seasonal load restrictions in place from March 1 to April 31.

Ramey Road is a 2-lane local road under the jurisdiction of the City of Port Colborne. Ramey Road is divided into 3 segments and runs north-south from Third Concession Road to just south of Second Concession Road and has a speed limit of 50 km/h.

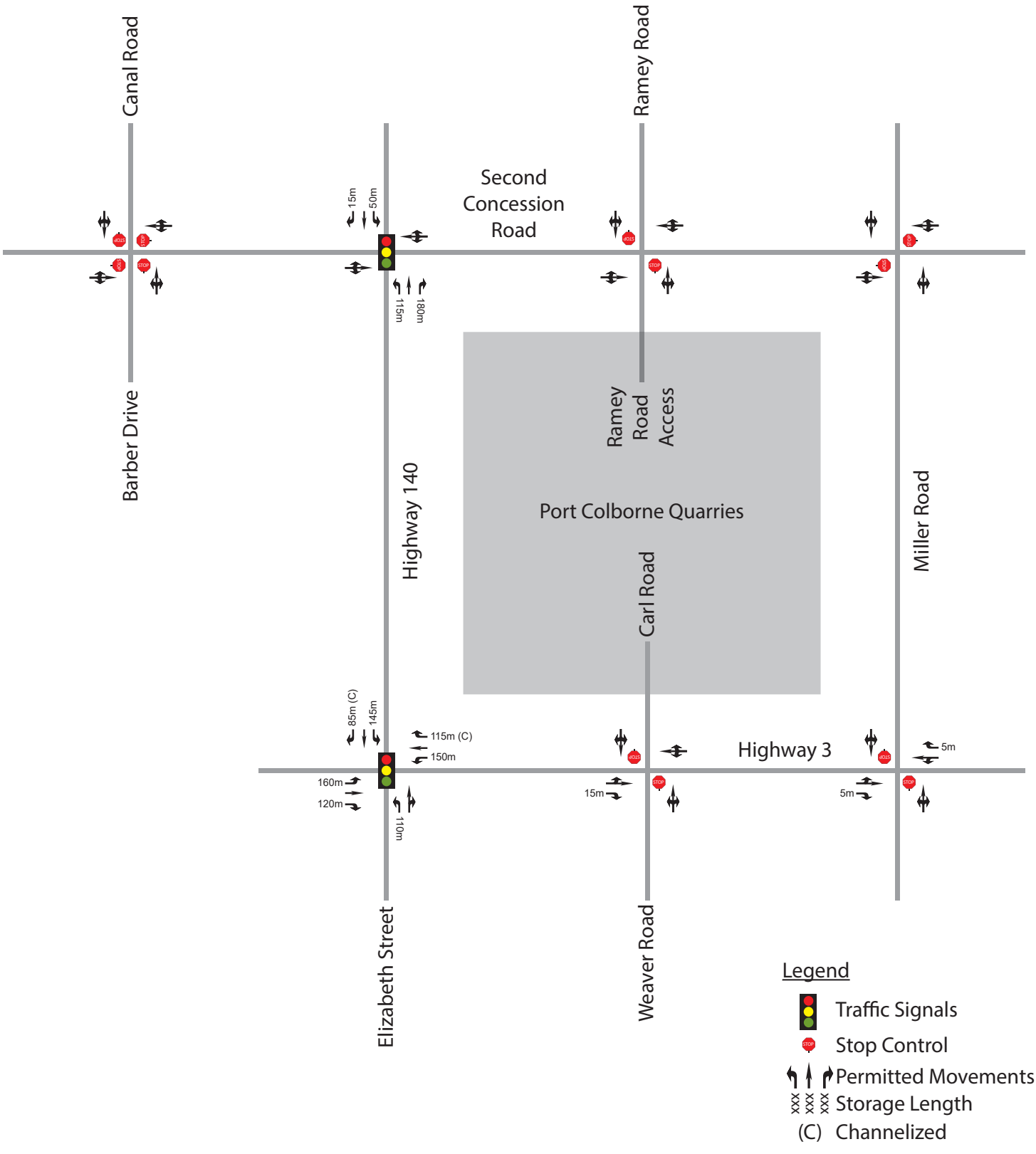
Canal Road is a 2-lane local road under the jurisdiction of the City of Port Colborne. Canal Road runs north-south from Second Concession Road to Biggar Road and has a speed limit of 50 km/h.

Barber Drive is a 2-lane local road under the jurisdiction of the City of Port Colborne. Barber Road runs north-south from Highway 3 to Second Concession Road and has a speed limit of 50 km/h.

Carl Road is a 2-lane local road under the jurisdiction of the City of Port Colborne. Carl Road runs north-south from Highway 3 to Chippawa Road and has a speed limit of 60 km/h. The road allowance between Highway 3 and Second Concession Road, however, is currently unopened.

Weaver Road is a 2-lane local road under the jurisdiction of the City of Port Colborne. Weaver Road runs north-south from Lake Erie to Highway 3 and has a speed limit of 50 km/h.

The existing lane configurations and traffic controls for the existing study area intersections have been provided in **Exhibit 4-1**.



Port Colborne Quarries Pit 3 Expansion
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Exhibit 4-1:
Existing (2019)
Land Configurations &
Traffic Controls

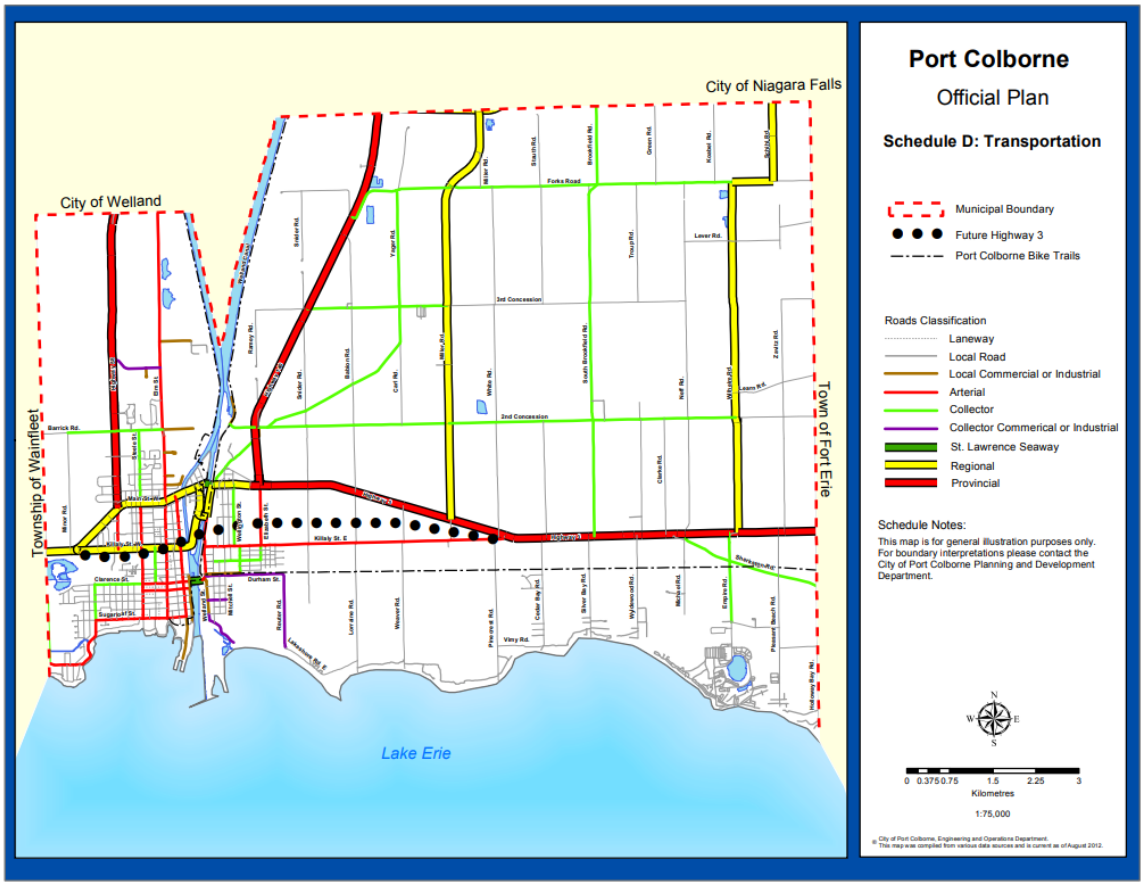
PROJECT No. 115774
DATE: October 2020
SCALE: N.T.S.

5 Future Conditions

5.1 Future Road Network

Schedule D of the City of Port Colborne Official Plan indicates that Highway 3 may be realigned in the future, as shown below in **Exhibit 5-1**, however, based on discussions with MTO staff, there are currently no plans to realign Highway 3 within the horizon year of this study. City of Port Colborne staff have further indicated that there are currently no plans for road network modifications within the study area.

Exhibit 5-1 - Schedule D: Transportation - City of Port Colborne Official Plan



Source: City of Port Colborne Official Plan

The Niagara Region Transportation Master Plan (TMP) outlines future capital projects throughout the Niagara Region until 2041 and indicates that, in the vicinity of the study area, there are currently no plans for modifications to any of the study area roadways and intersections.

The Ontario Ministry of Transportation's (MTO) Southern Highway Program (2017-2021) also outlines future capital and maintenance projects throughout all southern Ontario for all provincially maintained highways. Based on MTO's Southern Highway Program there are currently no plans for modifications to Highway 140 or Highway 3 within the study area between 2017 and 2021. Furthermore, based on discussions with MTO staff, there are no plans for modifications to Highway 3 or Highway 140 within the horizon of this study.

5.2 Future Background Developments

The MTO Traffic Impact Study (TIS) guidelines specify that all significant developments proposed within the surrounding area which are likely to occur within the study's horizon year must be identified and taken into consideration in the development of future background traffic projections.

For reference, there are two identified future developments outside of the subject site's road network study area, summarized in **Exhibit 5-2**. The build-out target year was not identified for both sites and both addresses are not within the study area road network. As both developments are outside the study area, the traffic generated by these developments will be accounted for through the application of a background growth rate.

Exhibit 5-2 - Future Background Developments

DEVELOPMENT	LOCATION	LAND USE	SIZE	BUILD-OUT YEAR
Olde Humberstone Village Subdivision	Near the Killaly Street / Mellanby Avenue intersection.	Townhome	90 units	Unknown
		Semi-Detached Homes	14 units	
Port Colborne Energy Park	The site is located within the lands bound by Tunnel Road, Third Concession Road, Highway 140 and Canal Road.	Petroleum Tank Farm	58 tanks	2014[1]
		Solar Farm	unknown	
		General Light Industrial	43 acres	

Notes:
1- The Traffic Impact Study prepared by Paradigm Transportation Solutions Ltd. (September 2013) indicated that Phase 1 of the site would be constructed by 2014 and that the site would be fully built-out by 2019. Construction of the site has not yet begun.

6 Traffic Volumes

6.1 Existing Traffic Volumes

Weekday morning and afternoon peak hour turning movement counts were conducted by Ontario Traffic Inc. on February 28, 2019 for the following intersections:

- Second Concession Road / Barber Drive / Canal Road;
- Highway 140 / Second Concession Road;
- Second Concession Road / Ramey Road;
- Second Concession Road / Miller Road (Regional Road 84);
- Highway 140 / Highway 3; and
- Highway 3 / Miller Road (Regional Road 84).

The weekday morning and afternoon peak hours for each intersection were generally between 7:00 am to 8:30 pm and 4:00 pm to 5:15 pm, respectively, however the weekday afternoon peak hour for the Second Concession Road / Barber Drive / Canal Road intersection was between 5:00 pm and 6:00 pm.

Existing (2019) weekday morning and afternoon peak hour traffic volumes are shown below in **Exhibit 6-1**. Due to the limitations of data collection during the COVID-19 pandemic, there is no existing traffic volumes data available for the Highway 3 & Carl Road / Weaver Road intersection. The addition of site-generated traffic would have a negligible impact on traffic operations of the Weaver Road approach. As such, volumes to/from Weaver Road were not considered in this study as it bears no consequence to the results of the analysis.

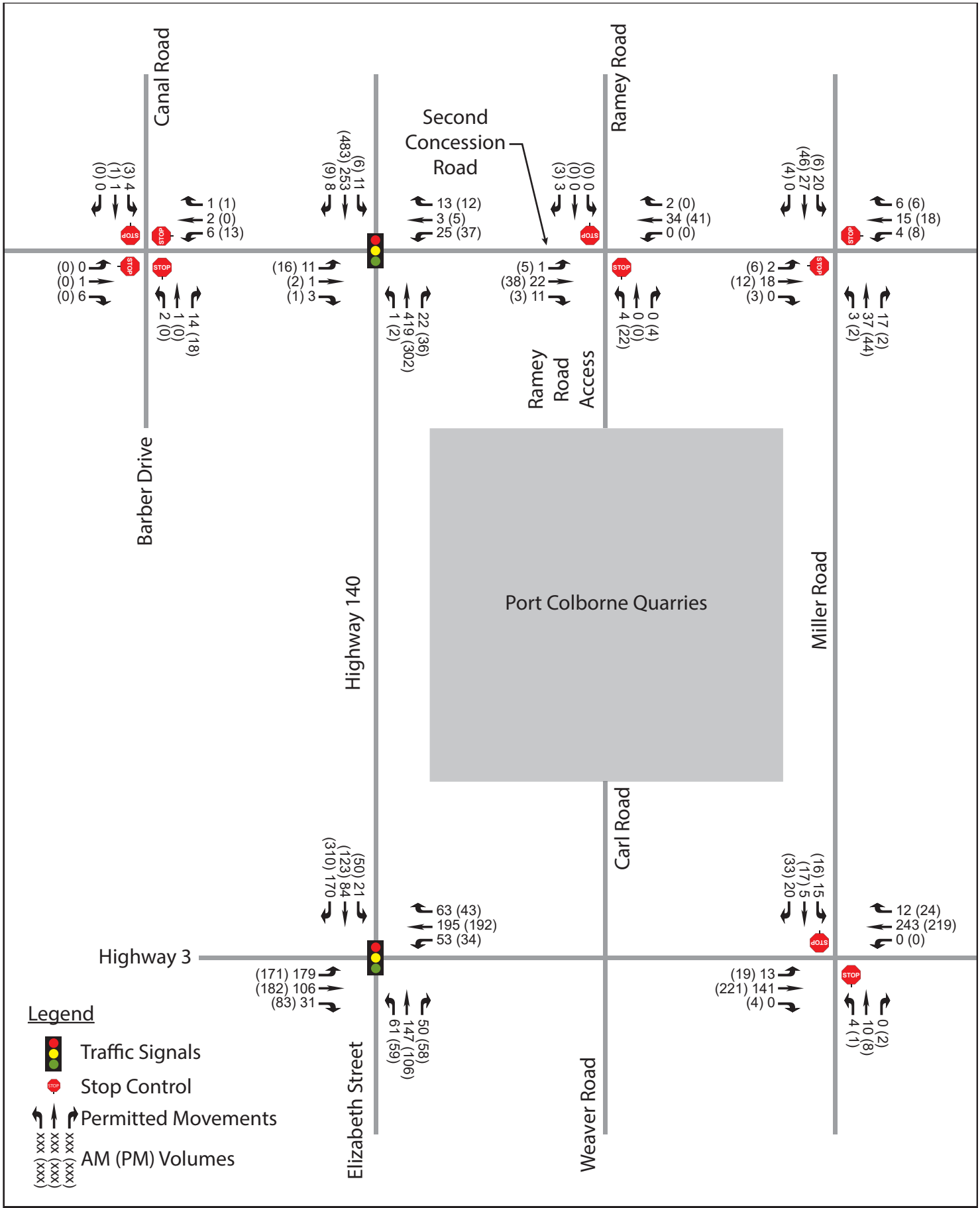


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Exhibit 6-1:
Existing (2019)
Traffic

PROJECT No. 115774
DATE: October 2020
SCALE: N.T.S.

6.2 Background Traffic Growth Rate

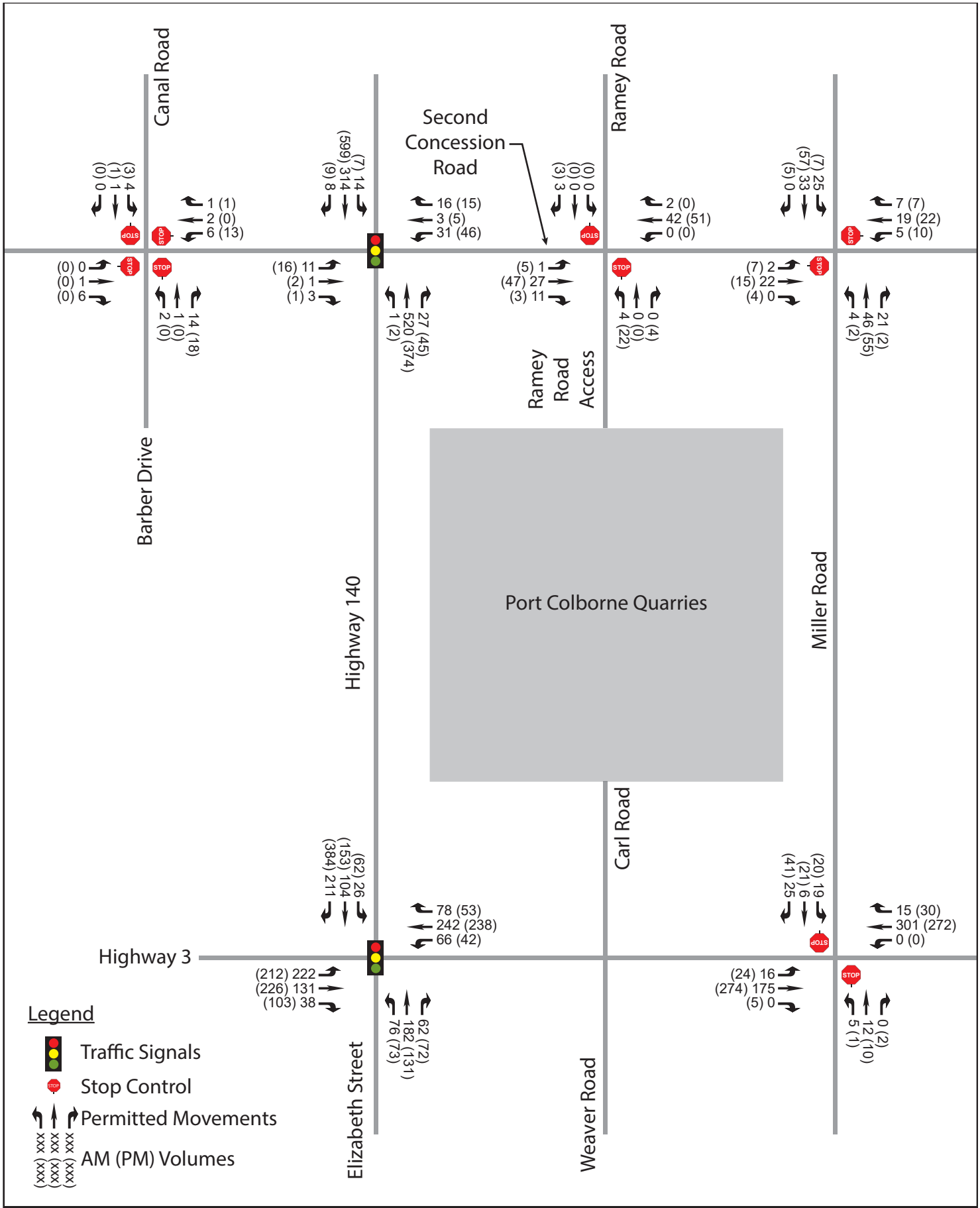
Based on discussions with MTO staff a 2% background traffic growth rate was established as a reasonable background traffic growth rate for the purposes of this study.

As mentioned in **Section 5.2**, given the construction status and location of the identified background developments outside of the TIS Report study area, it was considered sufficient to only apply the 2% background traffic growth rate recommended by MTO.

6.3 Future Background Traffic Volumes

The MTO Traffic Impact Study (TIS) guidelines indicate that three analysis years must be considered as part of a TIS: buildout, buildout plus 5 years, and buildout plus 10 years. It is anticipated that since the Pit 3 expansion will begin operation by 2031, the three analysis years are 2031, 2036 and 2041. The background traffic growth was applied to existing traffic volumes along the study area roadways to estimate future traffic background volumes in the 2031, 2036, and 2041 analysis years.

The resulting peak hour traffic volumes in the 2031, 2036 and 2041 background conditions are shown in **Exhibits 6-2 to 6-4**.



Port Colborne Quarries
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Exhibit 6-2:
2031 Future
Background Traffic

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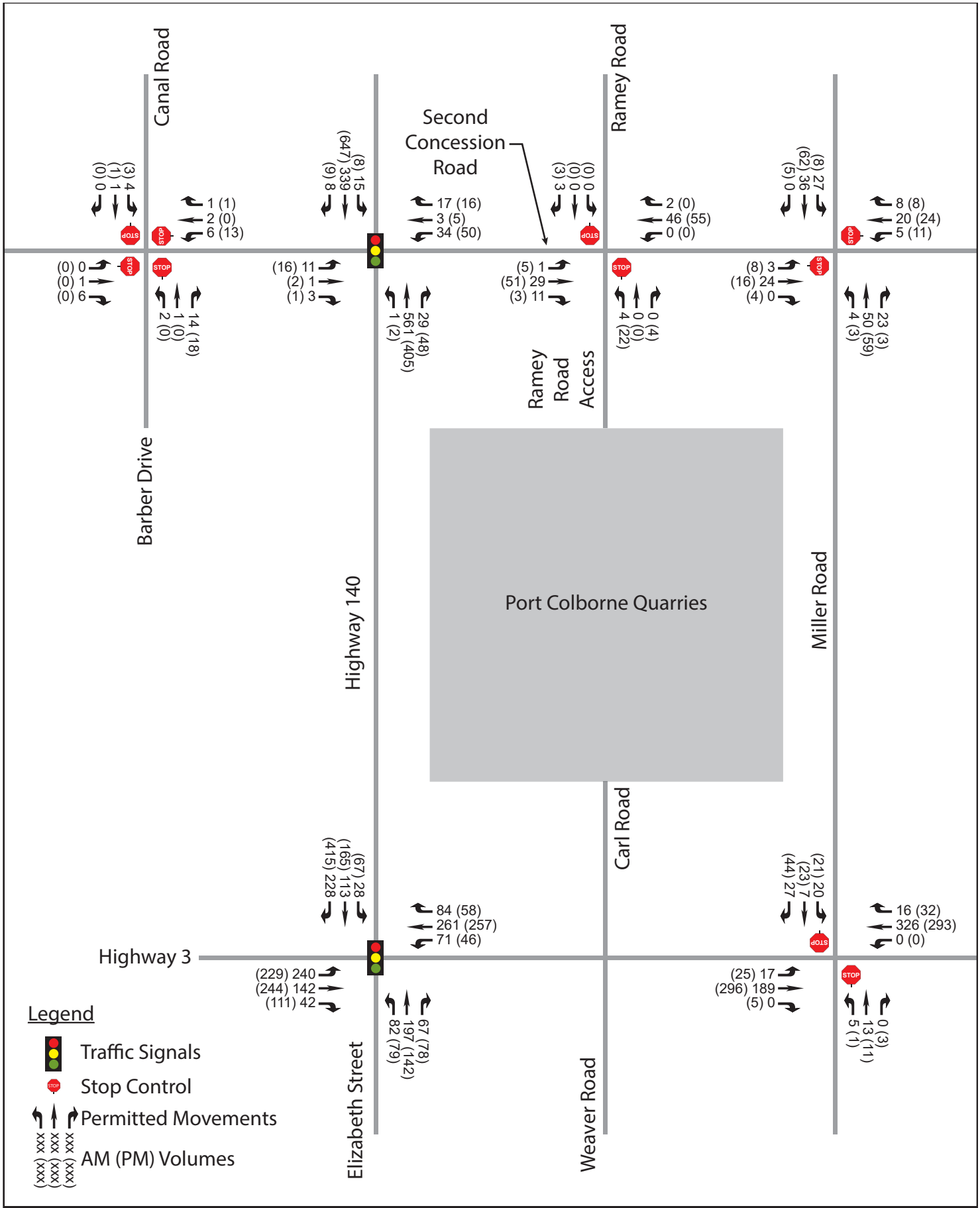

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Exhibit 6-3:
2036 Future
Background Traffic

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DATE: October 2020
SCALE: N.T.S.

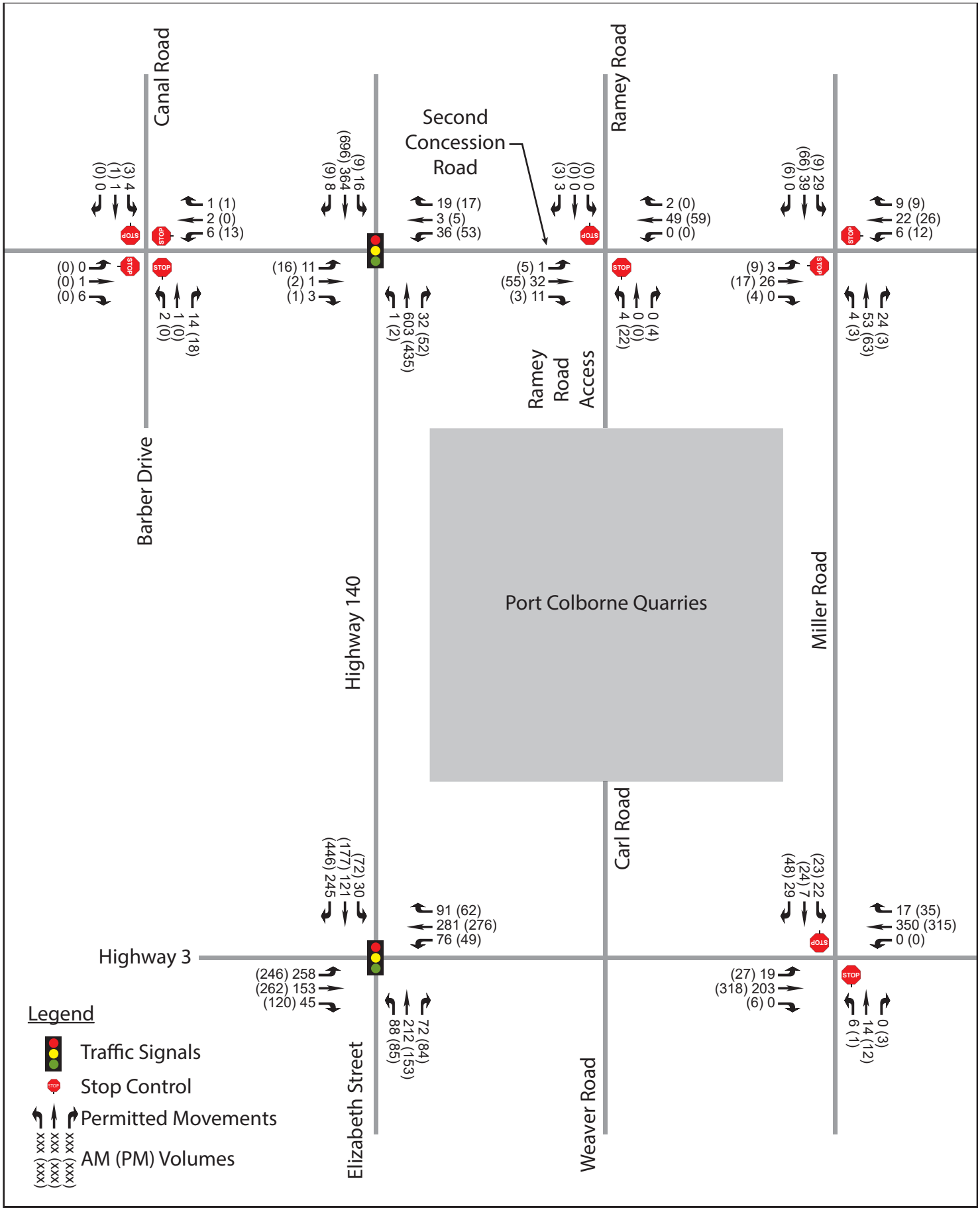

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Exhibit 6-4:
2041 Future
Background Traffic

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DATE: October 2020
SCALE: N.T.S.

6.4 Trip Generation

Based on information provided by Port Colborne Quarries Inc. (PCQI) staff, an annual extraction rate of 1,000,000 tonnes per year is considered a reasonable annual extraction rate for the planned Pit 3 expansion operations, based on past performance. Given that there is no intention to increase extraction capacity, an annual extraction rate of 1,000,000 tonnes per year will be used to estimate the number of truck trips generated by subject site Pit 3 expansion operations through to the 2041 horizon.

PCQI staff indicate that truck volumes are steady throughout the day with no peaking. With approximately 250 workdays per year, 10 work hours per work day, and an average load of 26 tonnes per truck, it is expected that the subject site Pit 3 expansion operations will generate an average of 15.4 truck trips per hour.

For the purposes of the Synchro traffic capacity analysis, the truck volumes have been converted into equivalent passenger car volumes. Based on the Transportation Research Board's Highway Capacity Manual 2010 (HCM), a heavy vehicle is equivalent to two passenger cars and therefore the passenger car equivalent (PCE) trips generated by the subject site (i.e. automobile and truck traffic combined) are provided.

The traffic counts recorded in February 2019 found that during the weekday morning peak hour, the subject site generated nine truck and six automobile trips. During the afternoon peak hour, six truck and 23 automobile trips were observed. This is well below the volume of truck-only trips calculated based on received PCQI operations information. This may be due to the traffic count being conducted during the winter, when trucking volumes may be lower than during the summer.

This trip estimate is compared to observed existing traffic activity at the subject site below in **Exhibit 6-5.** The trips determined to be most appropriate for usage in this TIS traffic analysis is also provided.

Exhibit 6-5 - Trip Generation Results

SUBJECT SITE LAND USE	TRIP CALCULATION METHOD	AM PEAK HOUR TRIPS (PCE)			PM PEAK HOUR TRIPS (PCE)		
		IN	OUT	TOTAL	IN	OUT	TOTAL
PCQI quarry operations	PCQI extraction rate, work scheduling, truck capacity	31	31	62	0	0	0
	February 2019 traffic data observations	16	8	24	6	29	35
	Trips applied for TIS analysis	**47**	**39**	**86**	**6**	**29**	**35**

Notes:
PCE = Passenger Car Equivalent

PCQI staff have indicated that trucking activities begin around 6:00 am and the last truck leaves the site around 4:00 pm. As such, no significant volume of trucking activity is expected to occur at the site during the afternoon peak hour. Afternoon peak hour traffic will consist of employees completing their shift.

It is not anticipated that there will be an increase in the number of employees as a result of the Pit 3 expansion and employee parking is expected to remain in its current location. Existing employee trips to/from the site have already been captured in the traffic counts and no new employee trips are expected.

To be conservative, for Pit 3 expansion trucking operations, the calculated subject site truck traffic volumes are utilized in this TIS report's future total traffic analysis. The existing site traffic activity was not subtracted from the future total traffic analysis and kept as-is due to the minimal volumes observed.

6.5 Trip Distribution and Assignment

PCQI staff have indicated that during the early phases of the Pit 3 Expansion, until the Highway 3 access is constructed, all truck traffic will enter and exit the site from the existing Ramey Road access and head north or south via Highway 140.

Once the Highway 3 access is constructed but while Pit 1 is not fully backfilled, truck traffic will enter the site via the Ramey Road access to dump a load of clean fill in Pit 1, then traverse the site internally to the Pit 3 Expansion to pick up a load of new material, then exit via the Highway 3 access.

Once Pit 1 is fully backfilled, it is expected that all truck traffic will enter and exit via the Highway 3 access.

The truck trip distribution was determined based on discussions with PCQI staff.

Given the timing for the opening of the Highway 3 access and the projected time required to backfill Pit 1, a separate trip distribution has been assumed for each analysis year:

2031:

- 100% inbound and outbound trips via Ramey Road access:
    - 50% to/from the North via Highway 140
    - 50% to/from the West via Highway 3

2036:

- 100% inbound trips via Ramey Road access and 100% of outbound trips via Highway 3 access:
    - 45% to/from the North via Highway 140
    - 45% to/from the West via Highway 3
    - 10% to/from the East via Highway 3

2041:

- 100% inbound and outbound trips via Highway 3 access:
    - 45% to/from the North via Highway 140
    - 45% to/from the West via Highway 3
    - 10% to/from the East via Highway 3

Using the above distributions, the estimated 2031, 2036 and, 2041 site-generated peak hour traffic volumes were assigned to the adjacent road network along logical routes, as shown in **Exhibits 6-6 to 6-8**, respectively.

Given the seasonal reduced load restrictions and the rural residential nature of Second Concession Road and Miller Road, the distribution of site-generated traffic did not assign additional traffic to these roadways nor have these roadways been identified as planned trucking routes by PCQI staff.

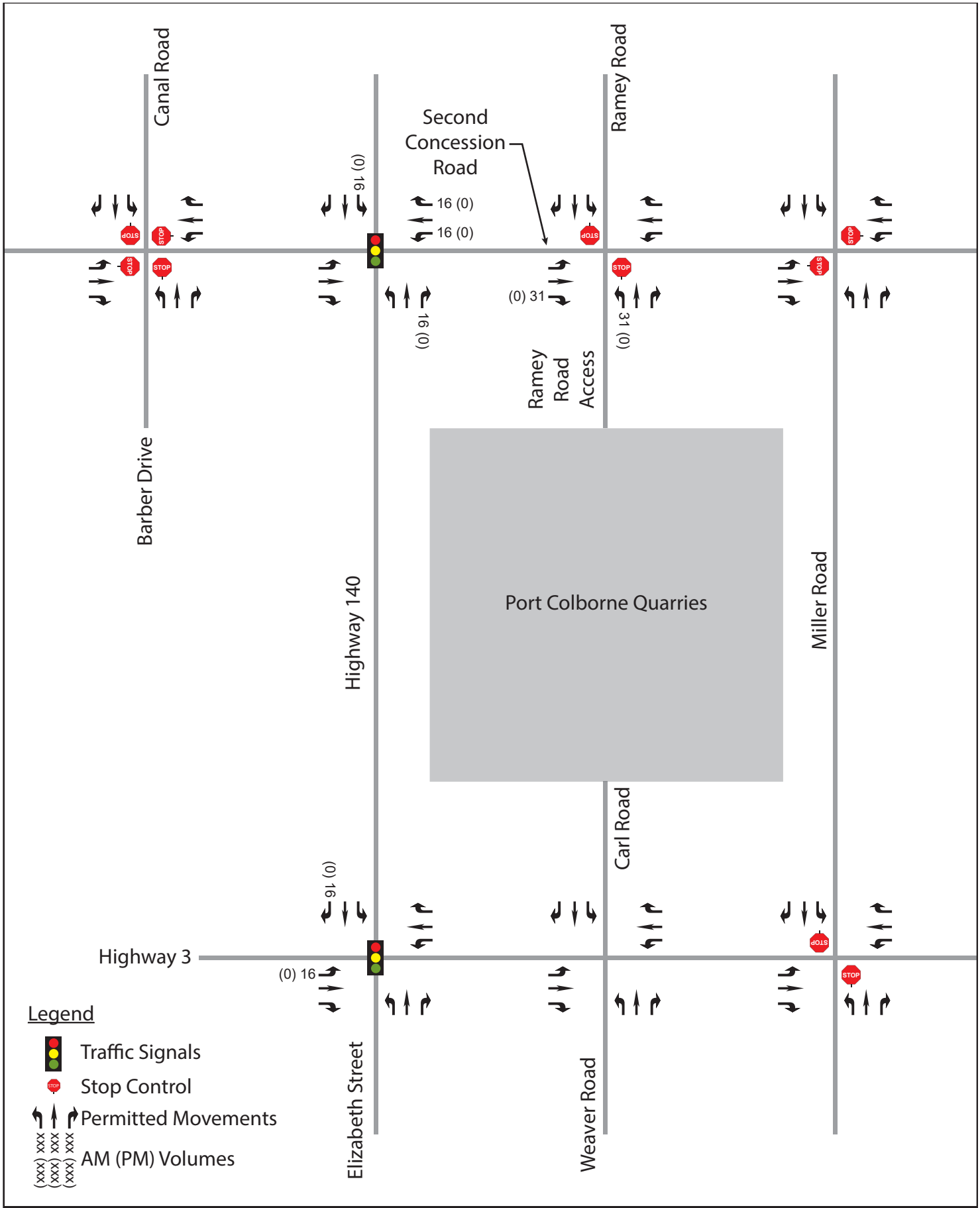

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Exhibit 6-6:
2031 Site-Generated Traffic

PROJECT No. 115774
DATE: October 2020
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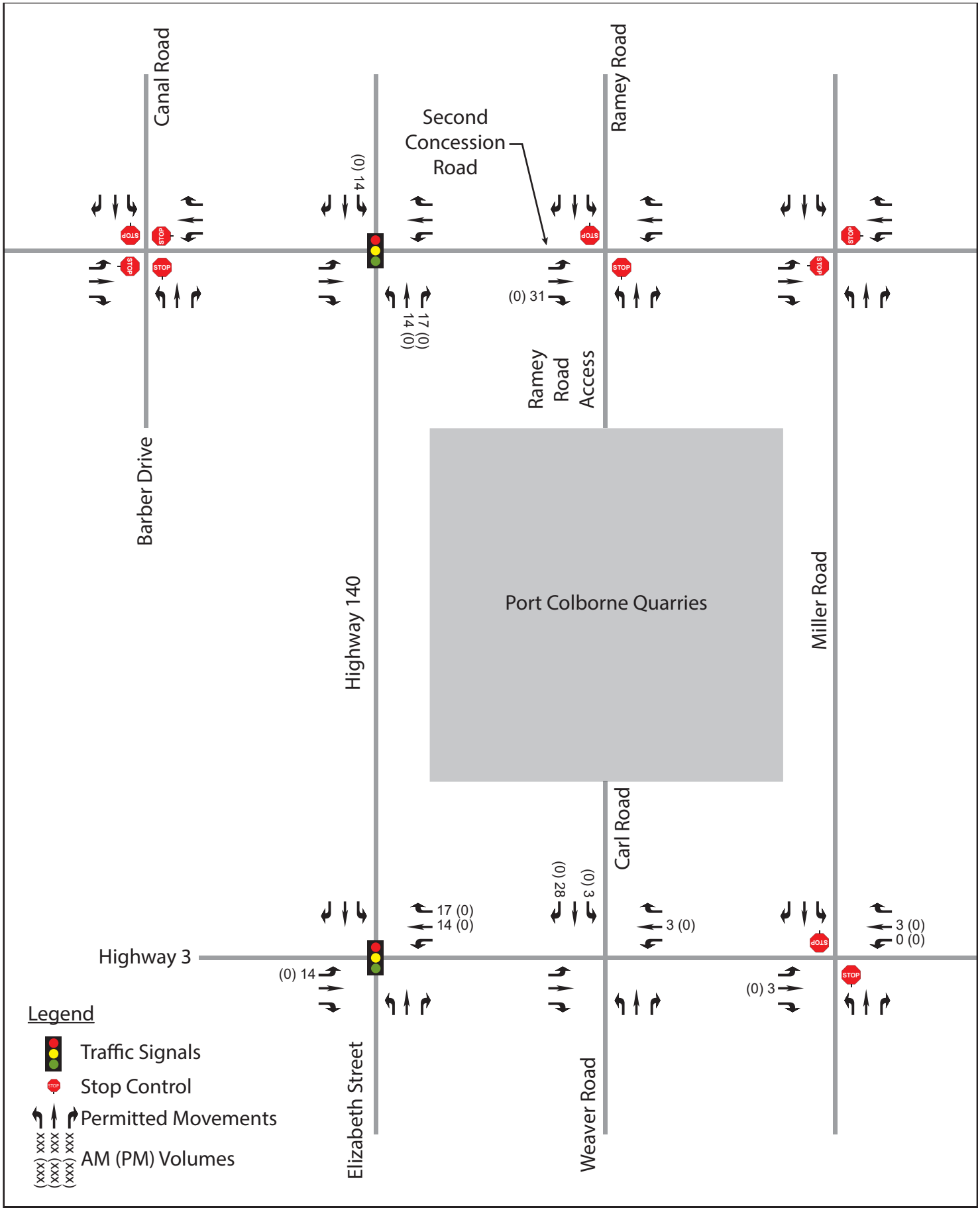

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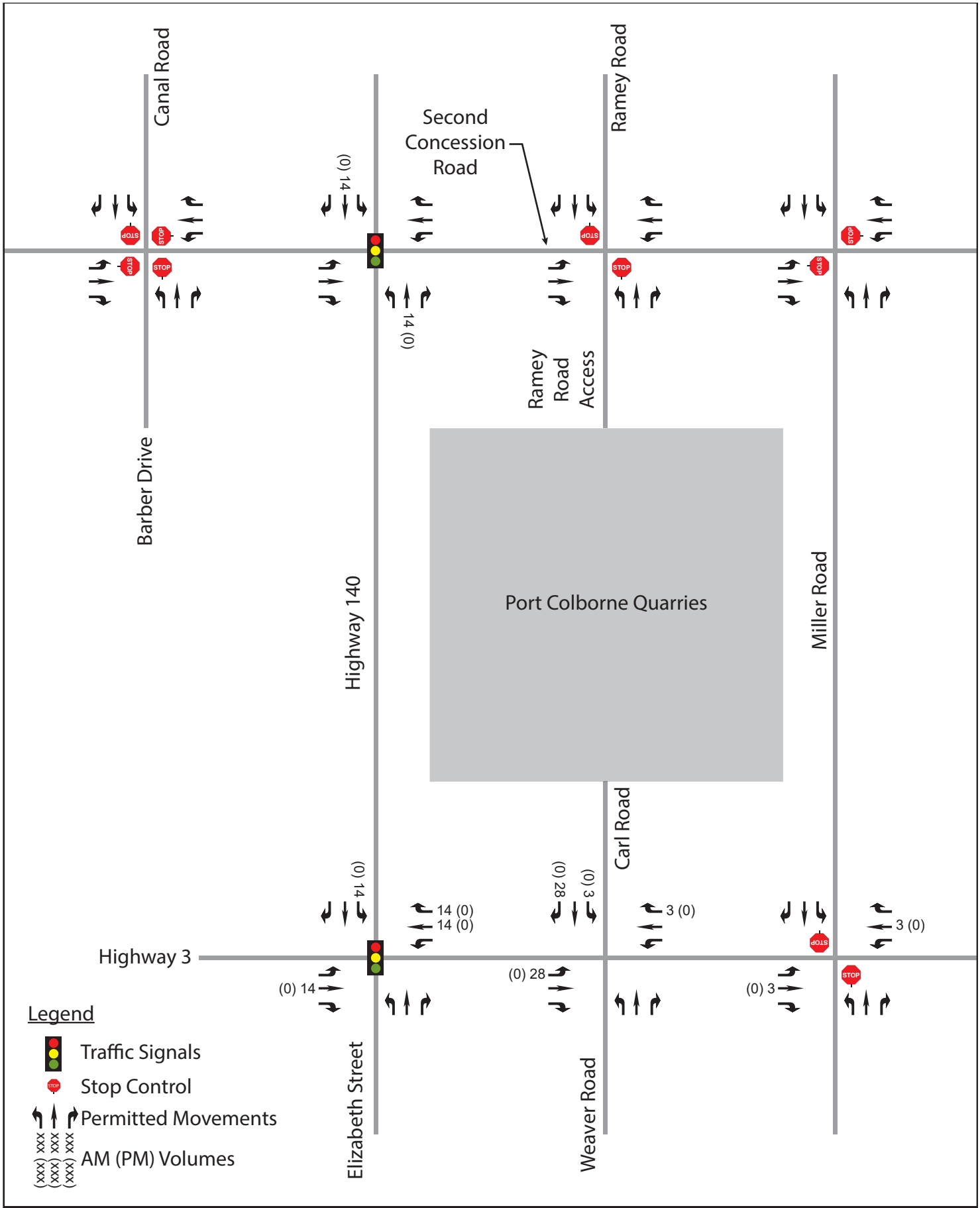
Exhibit 6-7:
2036 Site-Generated Traffic

PROJECT No. 115774
DATE: October 2020
SCALE: N.T.S.



Port Colborne Quarries
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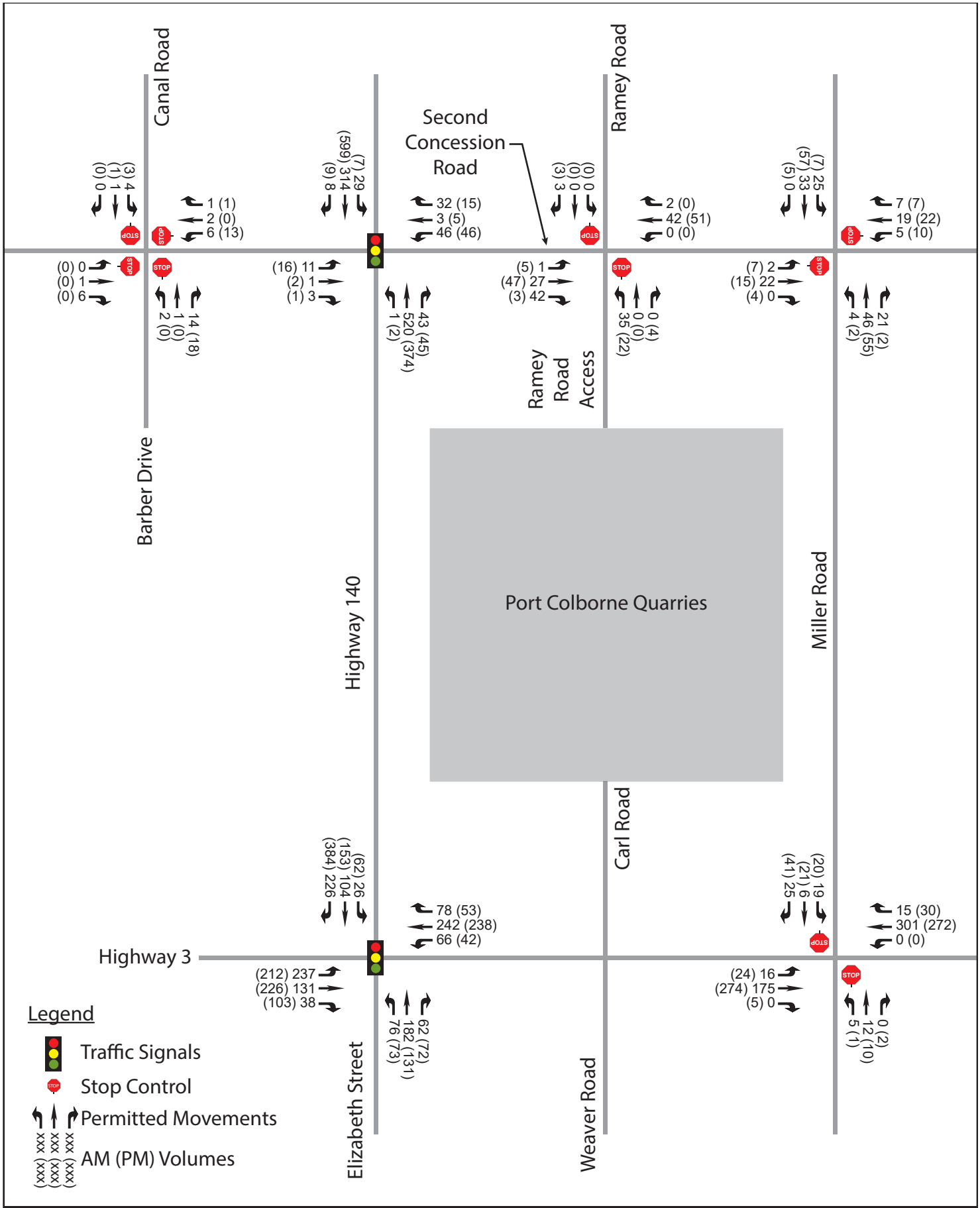
Exhibit 6-8:
2041 Site-Generated
Traffic

PROJECT No. 115774
DATE: October 2020
SCALE: N.T.S.

6.6 Future Total Traffic Volumes

The estimated site-generated peak hour traffic volumes were added to background traffic volumes to establish the 2031, 2036, and 2041 future total traffic volumes, as shown in **Exhibits 6-9 to 6-11,** respectively.



Port Colborne Quarries
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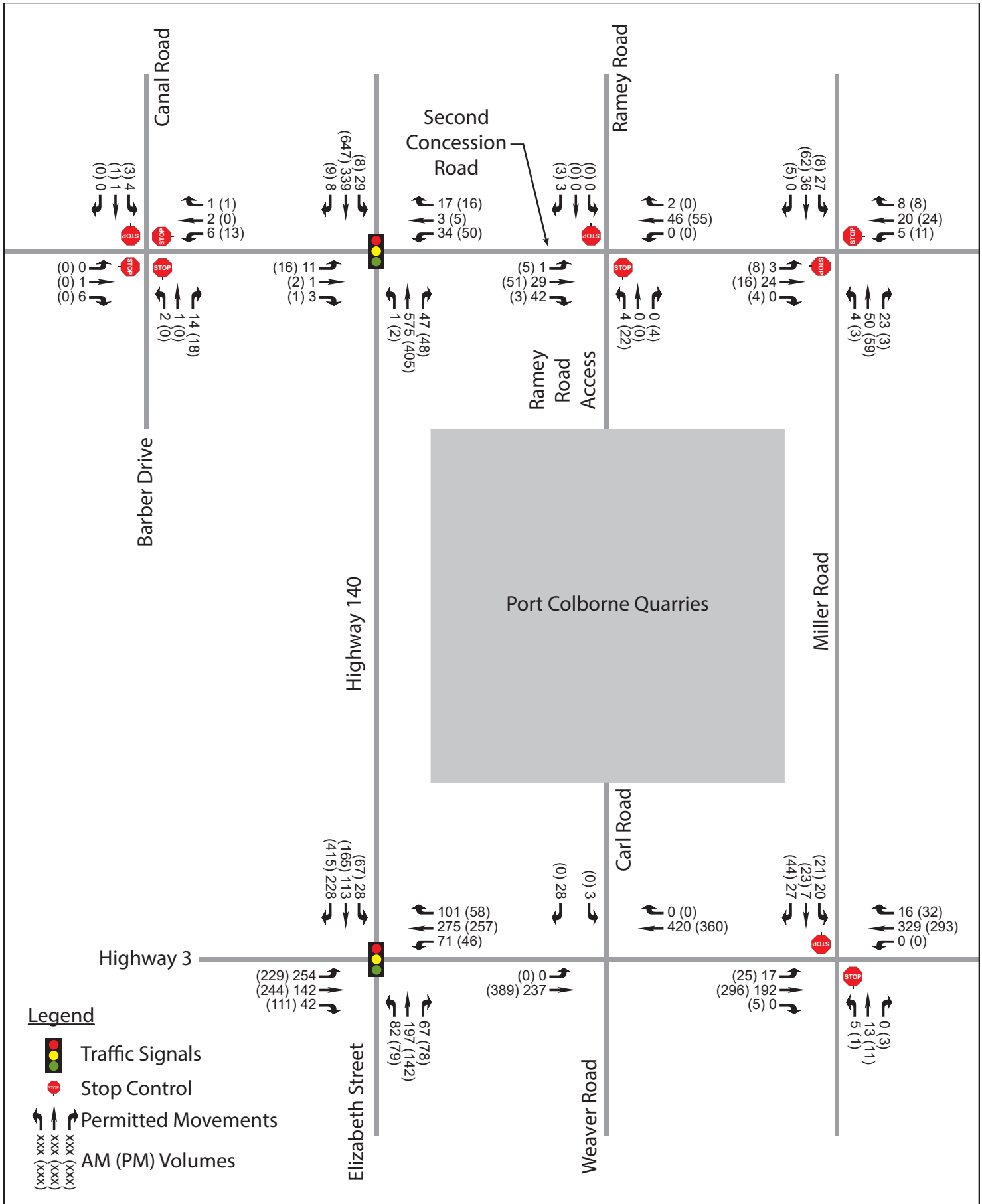
Exhibit 6-9:
2031 Future
Total Traffic

PROJECT No. 115774
DATE: October 2020
SCALE: N.T.S.



Port Colborne Quarries
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Exhibit 6-10:
2036 Future
Total Traffic

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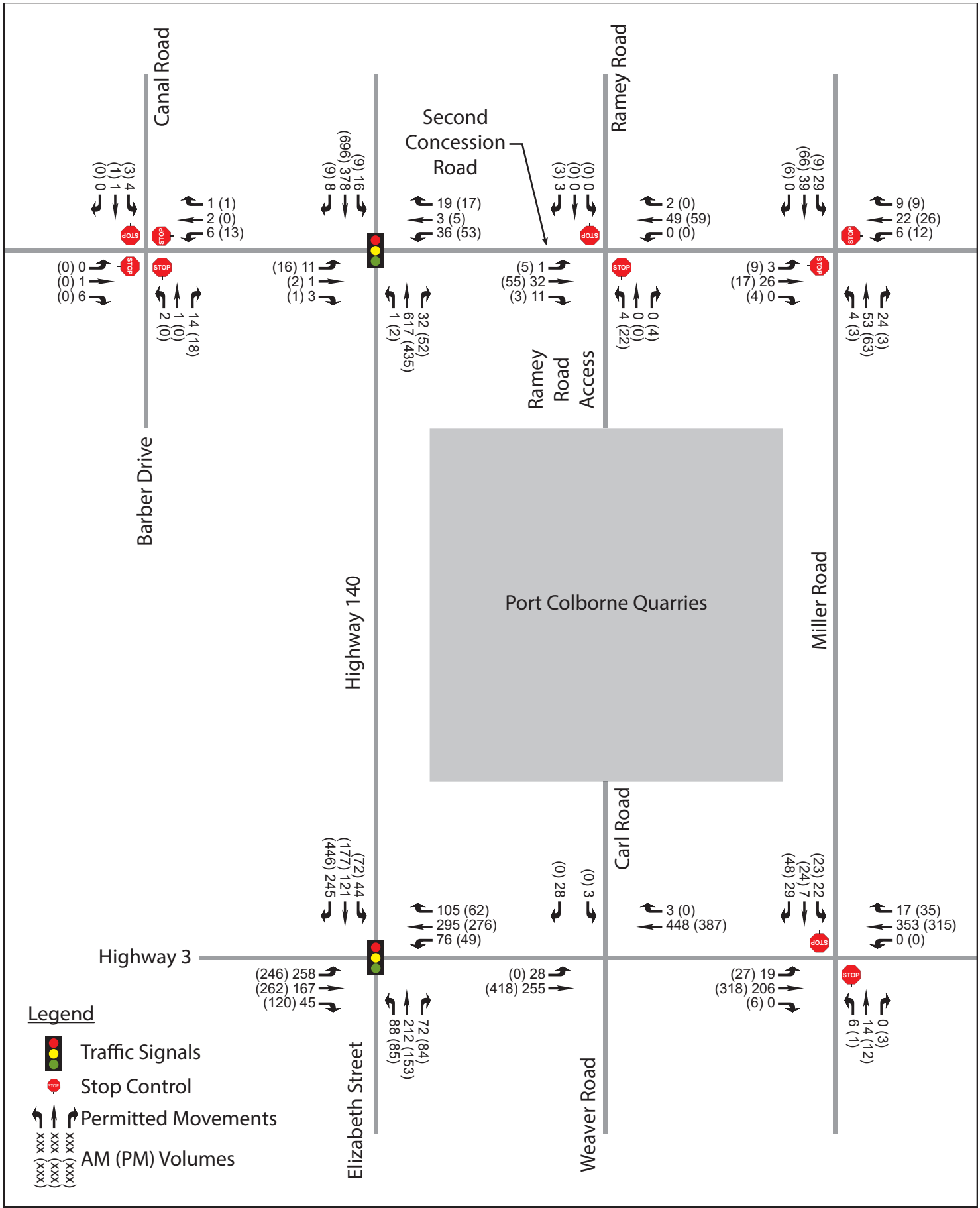
DATE: October 2020
SCALE: N.T.S.



Port Colborne Quarries
Pit 3 Expansion
Traffic Impact Study

Exhibit 6-11:
2041 Future
Total Traffic

PROJECT No. 115774
DATE: October 2020
SCALE: N.T.S.

7 Traffic Analysis

Intersection capacity analyses were undertaken at all intersections within the study area using Synchro v10, under the following traffic scenarios:

- Existing (2019) Traffic;
- Future (2031, 2036 & 2041) Background Traffic; and
- Future (2031, 2036 & 2041) Total Traffic.

The traffic analysis model was developed using available information on the existing and future transportation network from field investigations, planning documents, and discussions with staff from City of Port Colborne, Niagara Region, and MTO.

7.1 Base Road Network

The existing intersection configuration is shown in **Exhibit 4-1**. Existing signal timing plans for the two signalized intersections in the study area were provided by MTO.

It was assumed that the Highway 3 access would be constructed by the 2036 analysis year and would maintain the existing two-way stop-control configuration at the Highway 3 & Carl Road / Weaver Road intersection. In the analysis of future traffic conditions, any intersection modification requirements identified in a preceding analysis year were carried forward as the base intersection configuration for the following analysis year.

The intersection capacity analysis is used primarily as a tool to evaluate delay, levels of service (LOS), and capacity restrictions. Geometric requirements based on MTO standards may also trigger additional modifications not identified in this analysis. Any additional geometric requirements were evaluated and presented in Section 9 of this report.

7.2 Operational Criteria

7.2.1 Signalized Intersections

The intersection capacity of a traffic signal-controlled intersection is commonly expressed by the manner in which an intersection functions in terms of its volume to capacity ratio (v/c ratio) and the ‘Level of Service’ (LOS) it provides.

The v/c ratio is the relationship between the observed or estimated traffic demand and available capacity. This value can be evaluated for a single lane, an approach, or an intersection. A v/c ratio of less than 1.0 means there is sufficient capacity to accommodate traffic demand. A v/c ratio of 1.0 or more means the available capacity has been met and is insufficient to accommodate traffic demand.

The LOS definition generally describes these conditions in terms of delay, in seconds, during a single cycle at a traffic signal. LOS is given letter designations from ‘A’ to ‘F’. LOS ‘A’ represents the best operating conditions and Level of Service ‘F’ indicates very poor operating conditions. The time delay thresholds for each Level of Service grade are summarized in **Exhibit 7-1.**

Exhibit 7-1 - Level of Service Criteria – Signalized Intersections

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (S)
A	<10
B	>10 and <20
C	>20 and <35
D	>45 and <55
E	>55 and <80
F	>80

The MTO Traffic Impact Study guidelines set the minimum v/c ratio for traffic movements to be used in this analysis at 0.85. Therefore, movements and/or intersections with a v/c ratio of 0.85 or more must be identified and considered for improvements.

7.2.2 Unsignalized Intersections

For an unsignalized intersection, the LOS is defined in terms of the critical or worst-performing movement delays at the intersection. The Highway Capacity Manual 2010 (HCM), prepared by the Transportation Research Board, includes the following LOS criteria for unsignalized intersections, related to movement delays at the intersection, as shown in **Exhibit 7-2.**

Exhibit 7-2 - Level of Service Criteria – Unsignalized Intersections

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (S)
A	<10
B	>10 and <15
C	>15 and <25
D	>25 and <35
E	>35 and <50
F	>50

The MTO Traffic Impact Study guidelines do not provide a minimum Level of Service (LOS) for unsignalized intersections. For the purpose of this analysis a minimum LOS of ‘D’ has been used as the operational threshold for evaluating unsignalized intersections. This generally represents the industry standard for the minimum acceptable LOS for an unsignalized intersection. Any unsignalized intersection with a LOS of ‘E’ or worse is therefore identified and potential mitigation measures are recommended.

7.2.3 Traffic Signal Warrants

Traffic signal warrants were evaluated for all unsignalized intersections using the established methodology outlined in the Ontario Traffic Manual (OTM) Book 12, Section 4.10: Justification 7 – Projected Volumes. This methodology specifically focused on traffic signal warrants in future conditions.

The OTM notes “where the intersection or road may not exist, eight-hour volumes may be difficult to obtain or predict with necessary accuracy. If eight-hour volumes are unavailable or not considered to be of sufficient accuracy, Peak Hour Volumes (PHV) may be estimated as part of transportation studies and reduced to Average Hourly Volumes (AHV) for comparison with traffic signal justifications for projected volumes.”

This method for converting estimated future traffic volumes into an Average Hourly Volumes for a typical day is based on the following formulae:

$$1)\ AHV = \frac{PHV}{2} \quad \textbf{or} \quad 2)\ AHV = \frac{amPHV + pmPHV}{4}$$

For this analysis, equation #2 was used since both morning and afternoon peak hour traffic volume projections have been established.

The results from the traffic warrant analysis indicate that none of the unsignalized intersections meet the traffic signal warrant under 2041 total traffic conditions. It is therefore assumed that all intersections would remain unsignalized unless the operational analysis demonstrated that signalization would be required to meet operational requirements.

The traffic signal warrant sheets have been provided in **Appendix B**.

7.3 Operational Results

All intersection capacity analysis output for the existing and future analysis years have been provided in **Appendix C.**

7.3.1 Existing Conditions Analysis

The existing intersection capacity analyses was completed using existing (2019) weekday morning and afternoon peak hour traffic volumes shown in **Exhibit 6-1**. The results of the intersection capacity analyses under existing traffic conditions have been presented in **Exhibit 7-3** and **Exhibit 7-4**.

Exhibit 7-3 – Existing Conditions Signalized Analysis Summary

Intersection	Intersection			Critical Movement						
	LOS	Delay	V/C Ratio	Mvmt	LOS	Delay (s)	V/C Ratio	50th %tile Queue (m)	95th %tile Queue (m)	Storage Capacity (m)
Weekday AM Peak Hour										
Highway 140 & Second Concession Road	A	5.7	0.43	EBT	B	15.2	0.11	0.2	4.3	-
				WBT	B	16.1	0.26	0.5	7.8	-
				NBL	A	3.6	0.00	0.0	0.5	113
				NBT	A	5.4	0.45	0.0	39.4	-
				NBR	A	3.7	0.02	0.0	1.8	180
				SBL	A	3.7	0.03	0.0	2.2	50
				SBT	A	4.5	0.28	0.0	22.5	-
				SBR	A	3.6	0.01	0.0	0.3	15
Elizabeth Street/Highway 140 & Highway 3	B	11.2	0.44	EBL	B	11.2	0.45	9.7	26.0	160
				EBT	A	8.9	0.17	5.0	14.0	-
				EBR	A	8.3	0.02	0.0	2.2	120
				WBL	A	8.7	0.12	2.5	8.5	150
				WBT	A	9.7	0.31	9.8	24.1	-
				WBR	A	8.3	0.04	0.0	5.2	115
				NBL	B	12.8	0.19	3.6	12.1	110
				NBT	B	13.9	0.42	11.0	29.1	-
				SBL	B	12.3	0.08	1.2	5.8	145
				SBT	B	12.7	0.19	4.9	15.0	-
				SBR	B	12.4	0.12	0.0	11.0	85
Weekday PM Peak Hour										
Highway 140 & Second Concession Road	A	5.9	0.47	EBT	B	15.7	0.13	0.4	5.3	-
				WBT	B	16.9	0.33	0.9	10.1	-
				NBL	A	3.5	0.01	0.0	0.7	113
				NBT	A	4.5	0.31	0.0	26.3	-
				NBR	A	3.6	0.03	0.0	2.9	180
				SBL	A	3.5	0.01	0.0	1.5	50
				SBT	A	5.5	0.50	0.0	45.9	-
				SBR	A	3.5	0.01	0.0	0.4	15

Intersection	Intersection			Critical Movement						
	LOS	Delay	V/C Ratio	Mvmt	LOS	Delay (s)	V/C Ratio	50th %tile Queue (m)	95th %tile Queue (m)	Storage Capacity (m)
Elizabeth Street/Highway 140 & Highway 3	B	11.2	0.38	EBL	B	10.5	0.41	9.1	23.2	160
				EBT	A	9.2	0.27	9.0	21.2	-
				EBR	A	8.2	0.06	0.0	5.7	120
				WBL	A	8.3	0.08	1.6	5.8	150
				WBT	A	9.3	0.28	9.6	22.3	-
				WBR	A	8.1	0.03	0.0	3.4	115
				NBL	B	12.9	0.20	3.5	12.0	110
				NBT	B	13.5	0.33	7.7	22.8	-
				SBL	B	12.8	0.18	2.9	10.7	145
				SBT	B	13.2	0.28	7.4	20.6	-
				SBR	B	12.9	0.21	0.0	14.7	85

Exhibit 7-4 – Existing Conditions Unsignalized Analysis Summary

Intersection	Intersection Delay (s)	Lane	LOS	Delay (s)	V/C Ratio	Synchro Queue Length 95th (m)	Lane Storage (m)
Weekday AM Peak Hour							
Barber Drive/Canal Road & Second Concession Road	7.3	EB 1	A	7.2	-	-	-
		WB 1	A	7.7	-	-	-
		NB 1	A	6.7	-	-	-
		SB 1	A	8.9	-	-	-
Ramey Road & Second Concession Road	0.9	EB 1	A	0.2	0.00	0.0	-
		NB 1	B	10.0	0.01	0.1	-
		SB 1	A	8.8	0.00	0.1	-
Miller Road & Second Concession Road	4.2	EB 1	B	10.0	0.03	0.7	-
		WB 1	A	9.8	0.04	0.8	-
		NB 1	A	0.4	0.00	0.0	-
		SB 1	A	3.3	0.01	0.3	-
Miller Road & Highway 3	1.6	EB 1	A	0.8	-	0.8	0.01
		NB 1	B	12.5	B	12.5	0.03
		SB 1	B	11.5	B	11.5	0.07
Weekday PM Peak Hour							

Intersection	Intersection Delay (s)	Lane	LOS	Delay (s)	V/C Ratio	Synchro Queue Length 95th (m)	Lane Storage (m)
Barber Drive/Canal Road & Second Concession Road	6.8	EB 1	A	7.0	-	-	-
		WB 1	A	7.2	-	-	-
		NB 1	A	6.4	-	-	-
		SB 1	A	7.1	-	-	-
Ramey Road & Second Concession Road	2.6	EB 1	A	0.8	0.00	0.1	-
		NB 1	A	9.3	0.03	0.8	-
		SB 1	A	8.5	0.00	0.1	-
Miller Road & Second Concession Road	3.7	EB 1	A	9.6	0.03	0.7	-
		WB 1	A	9.6	0.04	1.1	-
		NB 1	A	0.3	0.00	0.0	-
		SB 1	A	0.9	0.00	0.1	-
Miller Road & Highway 3	2.0	EB 1	A	0.8	-	0.8	0.02
		NB 1	B	12.8	B	12.8	0.03
		SB 1	B	12.2	B	12.2	0.12

7.3.2 2031 Future Background Conditions Analysis

The results of the intersection capacity analyses under 2031 future background conditions have been presented in **Exhibit 7-5** and **Exhibit 7-6**.

Exhibit 7-5 – 2031 Future Background Conditions Signalized Analysis Summary

Intersection	Intersection			Critical Movement						
	LOS	Delay	V/C Ratio	Mvmt	LOS	Delay (s)	V/C Ratio	50th %tile Queue (m)	95th %tile Queue (m)	Storage Capacity (m)
Weekday AM Peak Hour										
Highway 140 & Second Concession Road	A	5.9	0.51	EBT	B	16.7	0.12	0.3	4.8	-
				WBT	B	18.4	0.35	0.9	10.2	-
				NBL	A	3.3	0.00	0.0	0.5	113
				NBT	A	5.6	0.53	0.0	51.5	-
				NBR	A	3.4	0.02	0.0	2.0	180
				SBL	A	3.5	0.04	0.0	2.5	50
				SBT	A	4.4	0.33	0.0	27.6	-
				SBR	A	3.4	0.01	0.0	0.2	15
Elizabeth Street/Highway 140 & Highway 3	B	12.3	0.53	EBL	B	13.2	0.56	13.9	38.3	160
				EBT	A	9.4	0.20	6.9	19.0	-
				EBR	A	8.5	0.03	0.0	3.0	120
				WBL	A	9.2	0.14	3.4	11.4	150
				WBT	B	10.5	0.37	13.8	34.3	-
				WBR	A	8.7	0.05	0.0	6.1	115
				NBL	B	13.9	0.24	5.0	17.1	110
				NBT	B	15.4	0.50	15.6	42.7	-
				SBL	B	13.2	0.10	1.6	7.7	145
				SBT	B	13.7	0.23	6.8	21.0	-
				SBR	B	13.4	0.15	0.0	13.3	85
Weekday PM Peak Hour										
Highway 140 & Second Concession Road	A	7.1	0.55	EBT	B	16.9	0.11	1.2	6.4	-
				WBT	B	18.4	0.34	3.5	14.3	-
				NBL	A	3.9	0.01	0.1	0.7	113
				NBT	A	5.3	0.38	18.7	34.0	-
				NBR	A	3.9	0.03	0.0	3.1	180
				SBL	A	3.9	0.02	0.3	1.6	50
				SBT	A	7.0	0.60	35.5	63.6	-
				SBR	A	3.9	0.01	0.0	0.3	15

Intersection	Intersection			Critical Movement						
	LOS	Delay	V/C Ratio	Mvmt	LOS	Delay (s)	V/C Ratio	50th %tile Queue (m)	95th %tile Queue (m)	Storage Capacity (m)
Elizabeth Street/Highway 140 & Highway 3	B	12.1	0.47	EBL	B	11.6	0.50	12.0	32.5	160
				EBT	A	9.6	0.32	11.7	28.6	-
				EBR	A	8.3	0.07	0.0	6.6	120
				WBL	A	8.5	0.10	2.0	7.4	150
				WBT	A	9.7	0.33	12.4	30.1	-
				WBR	A	8.2	0.04	0.0	4.7	115
				NBL	B	14.1	0.24	4.6	16.4	110
				NBT	B	14.9	0.41	11.0	33.3	-
				SBL	B	14.0	0.23	3.9	14.6	145
				SBT	B	14.4	0.34	9.9	28.7	-
				SBR	B	14.0	0.26	0.0	17.6	85

Exhibit 7-6 – 2031 Future Background Conditions Unsignalized Analysis Summary

Intersection	Intersection Delay (s)	Lane	LOS	Delay (s)	V/C Ratio	Synchro Queue Length 95th (m)	Lane Storage (m)
Weekday AM Peak Hour							
Barber Drive/Canal Road & Second Concession Road	7.3	EB 1	A	7.2	-	-	-
		WB 1	A	7.7	-	-	-
		NB 1	A	6.7	-	-	-
		SB 1	A	8.9	-	-	-
Ramey Road & Second Concession Road	0.8	EB 1	A	0.2	0.00	0.0	-
		NB 1	B	10.1	0.01	0.1	-
		SB 1	A	8.8	0.00	0.1	-
Miller Road & Second Concession Road	4.3	EB 1	B	10.3	0.04	0.9	-
		WB 1	B	10.2	0.05	1.1	-
		NB 1	A	0.4	0.00	0.1	-
		SB 1	A	3.3	0.02	0.4	-
Miller Road & Highway 3	1.8	EB 1	A	0.8	-	0.8	0.02
		NB 1	B	13.9	B	13.9	0.04
		SB 1	B	12.8	B	12.8	0.11
Weekday PM Peak Hour							

Intersection	Intersection Delay (s)	Lane	LOS	Delay (s)	V/C Ratio	Synchro Queue Length 95th (m)	Lane Storage (m)
Barber Drive/Canal Road & Second Concession Road	6.8	EB 1	A	7.0	-	-	-
		WB 1	A	7.2	-	-	-
		NB 1	A	6.4	-	-	-
		SB 1	A	7.1	-	-	-
Ramey Road & Second Concession Road	2.3	EB 1	A	0.6	0.00	0.1	-
		NB 1	A	9.4	0.03	0.8	-
		SB 1	A	8.5	0.00	0.1	-
Miller Road & Second Concession Road	3.7	EB 1	A	9.8	0.04	0.9	-
		WB 1	A	9.9	0.05	1.3	-
		NB 1	A	0.2	0.00	0.0	-
		SB 1	A	0.8	0.01	0.1	-
Miller Road & Highway 3	2.3	EB 1	A	0.8	-	0.8	0.02
		NB 1	B	14.5	B	14.5	0.04
		SB 1	B	14.0	B	14.0	0.18

7.3.3 2036 Future Background Conditions Analysis

The results of the intersection capacity analyses under 2036 future background conditions have been presented in **Exhibit 7-7** and **Exhibit 7-8**.

Exhibit 7-7 – 2036 Future Background Conditions Signalized Analysis Summary

Intersection	Intersection			Critical Movement						
	LOS	Delay	V/C Ratio	Mvmt	LOS	Delay (s)	V/C Ratio	50th %tile Queue (m)	95th %tile Queue (m)	Storage Capacity (m)
Weekday AM Peak Hour										
Highway 140 & Second Concession Road	A	6.9	0.54	EBT	B	16.4	0.10	0.8	5.2	-
				WBT	B	17.7	0.31	2.5	11.6	-
				NBL	A	3.9	0.00	0.0	0.5	113
				NBT	A	7.0	0.59	32.8	58.6	-
				NBR	A	4.0	0.02	0.0	2.2	180
				SBL	A	4.1	0.05	0.6	2.6	50
				SBT	A	5.3	0.36	16.6	30.6	-
				SBR	A	3.9	0.01	0.0	0.2	15
Elizabeth Street/Highway 140 & Highway 3	B	12.9	0.57	EBL	B	14.2	0.60	16.2	43.6	160
				EBT	A	9.5	0.21	7.8	21.0	-
				EBR	A	8.6	0.03	0.0	3.7	120
				WBL	A	9.2	0.15	3.8	12.3	150
				WBT	B	10.7	0.39	15.8	38.0	-
				WBR	A	8.7	0.06	0.0	6.4	115
				NBL	B	14.6	0.25	5.7	19.3	110
				NBT	B	16.7	0.54	18.4	50.3	-
				SBL	B	13.8	0.11	1.9	8.7	145
				SBT	B	14.5	0.25	7.9	24.3	-
				SBR	B	14.0	0.16	0.0	14.5	85
Weekday PM Peak Hour										
Highway 140 & Second Concession Road	A	7.1	0.58	EBT	B	18.2	0.12	1.3	6.8	-
				WBT	C	20.1	0.39	4.2	16.1	-
				NBL	A	3.7	0.01	0.1	0.7	113
				NBT	A	5.1	0.39	20.7	37.5	-
				NBR	A	3.7	0.03	0.0	3.1	180
				SBL	A	3.7	0.02	0.3	1.7	50
				SBT	A	7.1	0.62	40.0	71.6	-
				SBR	A	3.6	0.01	0.0	0.3	15

Intersection	Intersection			Critical Movement						
	LOS	Delay	V/C Ratio	Mvmt	LOS	Delay (s)	V/C Ratio	50th %tile Queue (m)	95th %tile Queue (m)	Storage Capacity (m)
Elizabeth Street/Highway 140 & Highway 3	B	12.5	0.5	EBL	B	12.3	0.54	13.7	36.7	160
				EBT	A	9.7	0.33	13.0	31.5	-
				EBR	A	8.3	0.07	0.0	6.8	120
				WBL	A	8.6	0.11	2.2	8.1	150
				WBT	A	9.9	0.35	13.9	33.2	-
				WBR	A	8.2	0.04	0.0	4.9	115
				NBL	B	14.7	0.27	5.3	18.7	110
				NBT	B	15.7	0.45	12.9	38.5	-
				SBL	B	14.6	0.25	4.5	16.5	145
				SBT	B	15.1	0.36	11.4	32.9	-
				SBR	B	14.7	0.28	0.0	18.8	85

Exhibit 7-8 – 2036 Future Background Conditions Unsignalized Analysis Summary

Intersection	Intersection Delay (s)	Lane	LOS	Delay (s)	V/C Ratio	Synchro Queue Length 95th (m)	Lane Storage (m)
Weekday AM Peak Hour							
Barber Drive/Canal Road & Second Concession Road	7.3	EB 1	A	7.2	-	-	-
		WB 1	A	7.7	-	-	-
		NB 1	A	6.7	-	-	-
		SB 1	A	8.9	-	-	-
Ramey Road & Second Concession Road	0.7	EB 1	A	0.2	0.00	0.0	-
		NB 1	B	10.2	0.01	0.1	-
		SB 1	A	8.9	0.00	0.1	-
Miller Road & Second Concession Road	4.3	EB 1	B	10.4	0.04	1.0	-
		WB 1	B	10.2	0.05	1.2	-
		NB 1	A	0.4	0.00	0.1	-
		SB 1	A	3.3	0.02	0.4	-
Miller Road & Highway 3	1.9	EB 1	A	0.8	-	0.8	0.02
		NB 1	B	14.6	B	14.6	0.05
		SB 1	B	13.4	B	13.4	0.12
Weekday PM Peak Hour							

Intersection	Intersection Delay (s)	Lane	LOS	Delay (s)	V/C Ratio	Synchro Queue Length 95th (m)	Lane Storage (m)
Barber Drive/Canal Road & Second Concession Road	6.8	EB 1	A	7.0	-	-	-
		WB 1	A	7.2	-	-	-
		NB 1	A	6.4	-	-	-
		SB 1	A	7.1	-	-	-
Ramey Road & Second Concession Road	2.1	EB 1	A	0.6	0.00	0.1	-
		NB 1	A	9.5	0.03	0.8	-
		SB 1	A	8.6	0.00	0.1	-
Miller Road & Second Concession Road	3.8	EB 1	A	10.0	0.04	0.9	-
		WB 1	A	10.0	0.06	1.5	-
		NB 1	A	0.3	0.00	0.0	-
		SB 1	A	0.9	0.01	0.1	-
Miller Road & Highway 3	2.4	EB 1	A	0.8	-	0.8	0.02
		NB 1	B	15.0	B	15.0	0.04
		SB 1	B	14.8	B	14.8	0.21

7.3.4 2041 Future Background Conditions Analysis

The results of the intersection capacity analyses under 2041 future background conditions have been presented in **Exhibit 7-9** and **Exhibit 7-10**.

Exhibit 7-9 – 2041 Future Background Conditions Signalized Analysis Summary

Intersection	Intersection			Critical Movement						
	LOS	Delay	V/C Ratio	Mvmt	LOS	Delay (s)	V/C Ratio	50th %tile Queue (m)	95th %tile Queue (m)	Storage Capacity (m)
Weekday AM Peak Hour										
Highway 140 & Second Concession Road	A	7.1	0.57	EBT	B	17.2	0.11	0.9	5.5	-
				WBT	B	18.8	0.33	2.9	12.9	-
				NBL	A	3.8	0.00	0.0	0.5	113
				NBT	A	7.2	0.61	36.6	65.8	-
				NBR	A	3.8	0.03	0.0	2.5	180
				SBL	A	4.0	0.05	0.6	2.7	50
				SBT	A	5.2	0.38	18.3	33.6	-
				SBR	A	3.8	0.01	0.0	0.2	15
Elizabeth Street/Highway 140 & Highway 3	B	13.7	0.61	EBL	B	16.0	0.64	18.9	50.2	160
				EBT	A	9.9	0.22	9.0	23.3	-
				EBR	A	8.9	0.03	0.0	4.0	120
				WBL	A	9.6	0.16	4.4	13.6	150
				WBT	B	11.2	0.41	18.1	42.5	-
				WBR	A	9.0	0.06	0.0	6.9	115
				NBL	B	15.1	0.27	6.7	20.7	110
				NBT	B	17.6	0.56	21.7	54.1	-
				SBL	B	14.3	0.12	2.2	9.2	145
				SBT	B	14.9	0.26	9.2	25.6	-
				SBR	B	14.5	0.18	0.0	14.8	85
Weekday PM Peak Hour										
Highway 140 & Second Concession Road	A	7.3	0.62	EBT	B	19.4	0.13	1.4	7.3	-
				WBT	C	21.7	0.44	4.7	18.2	-
				NBL	A	3.5	0.01	0.1	0.7	113
				NBT	A	5.0	0.41	22.7	40.7	-
				NBR	A	3.6	0.04	0.0	3.2	180
				SBL	A	3.5	0.02	0.4	1.8	50
				SBT	A	7.3	0.65	45.3	80.8	-
				SBR	A	3.5	0.01	0.0	0.2	15

Intersection	Intersection			Critical Movement						
	LOS	Delay	V/C Ratio	Mvmt	LOS	Delay (s)	V/C Ratio	50th %tile Queue (m)	95th %tile Queue (m)	Storage Capacity (m)
Elizabeth Street/Highway 140 & Highway 3	B	13.2	0.54	EBL	B	13.3	0.58	15.8	44.2	160
				EBT	B	10.0	0.35	14.9	37.2	-
				EBR	A	8.5	0.08	0.0	7.5	120
				WBL	A	8.7	0.11	2.5	9.3	150
				WBT	B	10.2	0.37	15.9	39.2	-
				WBR	A	8.3	0.04	0.0	5.5	115
				NBL	B	15.3	0.28	6.3	20.1	110
				NBT	B	16.4	0.48	15.7	42.6	-
				SBL	B	15.2	0.27	5.3	17.9	145
				SBT	B	15.7	0.38	13.5	35.7	-
				SBR	B	15.6	0.36	2.3	25.1	85

Exhibit 7-10 – 2041 Future Background Conditions Unsignalized Analysis Summary

Intersection	Intersection Delay (s)	Lane	LOS	Delay (s)	V/C Ratio	Synchro Queue Length 95th (m)	Lane Storage (m)
Weekday AM Peak Hour							
Barber Drive/Canal Road & Second Concession Road	7.3	EB 1	A	7.2	-	-	-
		WB 1	A	7.7	-	-	-
		NB 1	A	6.7	-	-	-
		SB 1	A	8.9	-	-	-
Ramey Road & Second Concession Road	0.7	EB 1	A	0.2	0.00	0.0	-
		NB 1	B	10.2	0.01	0.1	-
		SB 1	A	8.9	0.00	0.1	-
Miller Road & Second Concession Road	4.4	EB 1	B	10.6	0.05	1.1	-
		WB 1	B	10.4	0.06	1.4	-
		NB 1	A	0.4	0.00	0.1	-
		SB 1	A	3.3	0.02	0.5	-
Miller Road & Highway 3	2.0	EB 1	A	0.9	-	0.9	0.02
		NB 1	C	15.5	C	15.5	0.06
		SB 1	B	14.1	B	14.1	0.14
Weekday PM Peak Hour							

Intersection	Intersection Delay (s)	Lane	LOS	Delay (s)	V/C Ratio	Synchro Queue Length 95th (m)	Lane Storage (m)
Barber Drive/Canal Road & Second Concession Road	6.8	EB 1	A	7.0	-	-	-
		WB 1	A	7.2	-	-	-
		NB 1	A	6.4	-	-	-
		SB 1	A	7.1	-	-	-
Ramey Road & Second Concession Road	2.0	EB 1	A	0.6	0.00	0.1	-
		NB 1	A	9.5	0.03	0.8	-
		SB 1	A	8.6	0.00	0.1	-
Miller Road & Second Concession Road	3.8	EB 1	B	10.1	0.04	1.0	-
		WB 1	B	10.1	0.07	1.6	-
		NB 1	A	0.3	0.00	0.0	-
		SB 1	A	0.9	0.01	0.1	-
Miller Road & Highway 3	2.5	EB 1	A	0.9	-	0.9	0.02
		NB 1	C	15.9	C	15.9	0.05
		SB 1	C	15.8	C	15.8	0.24

7.3.5 2031 Future Total Conditions Analysis

The results of the intersection capacity analyses under 2031 future total conditions have been presented in **Exhibit 7-11** and **Exhibit 7-12**.

Exhibit 7-11 – 2031 Future Total Conditions Signalized Analysis Summary

Intersection	Intersection			Critical Movement						
	LOS	Delay	V/C Ratio	Mvmt	LOS	Delay (s)	V/C Ratio	50th %tile Queue (m)	95th %tile Queue (m)	Storage Capacity (m)
Weekday AM Peak Hour										
Highway 140 & Second Concession Road	A	7.1	0.52	EBT	B	16.0	0.10	0.8	5.0	-
				WBT	B	18.0	0.39	3.2	14.4	-
				NBL	A	4.0	0.00	0.0	0.6	113
				NBT	A	6.8	0.55	29.3	56.6	-
				NBR	A	4.1	0.04	0.0	3.3	180
				SBL	A	4.4	0.09	1.2	4.6	50
				SBT	A	5.3	0.34	15.1	30.3	-
				SBR	A	4.1	0.01	0.0	0.2	15
Elizabeth Street/Highway 140 & Highway 3	B	12.6	0.55	EBL	B	13.7	0.58	15.3	41.4	160
				EBT	A	9.3	0.19	6.9	19.0	-
				EBR	A	8.5	0.03	0.0	2.9	120
				WBL	A	9.1	0.14	3.4	11.3	150
				WBT	B	10.4	0.36	13.9	34.0	-
				WBR	A	8.6	0.05	0.0	6.1	115
				NBL	B	14.3	0.24	5.2	17.7	110
				NBT	B	15.9	0.50	16.1	44.3	-
				SBL	B	13.5	0.10	1.7	8.0	145
				SBT	B	14.1	0.23	7.0	21.7	-
				SBR	B	13.8	0.16	0.0	14.2	85
Weekday PM Peak Hour										
Highway 140 & Second Concession Road	A	7.1	0.55	EBT	B	16.9	0.11	1.2	6.4	-
				WBT	B	18.4	0.34	3.5	14.3	-
				NBL	A	3.9	0.01	0.1	0.7	113
				NBT	A	5.3	0.38	18.7	34.0	-
				NBR	A	3.9	0.03	0.0	3.1	180
				SBL	A	3.9	0.02	0.3	1.6	50
				SBT	A	7.0	0.60	35.5	63.6	-
				SBR	A	3.9	0.01	0.0	0.3	15

Intersection	Intersection			Critical Movement						
	LOS	Delay	V/C Ratio	Mvmt	LOS	Delay (s)	V/C Ratio	50th %tile Queue (m)	95th %tile Queue (m)	Storage Capacity (m)
Elizabeth Street/Highway 140 & Highway 3	B	12.1	0.47	EBL	B	11.6	0.50	12.0	32.5	160
				EBT	A	9.6	0.32	11.7	28.6	-
				EBR	A	8.3	0.07	0.0	6.6	120
				WBL	A	8.5	0.10	2.0	7.4	150
				WBT	A	9.7	0.33	12.4	30.1	-
				WBR	A	8.2	0.04	0.0	4.7	115
				NBL	B	14.1	0.24	4.6	16.4	110
				NBT	B	14.9	0.41	11.0	33.3	-
				SBL	B	14.0	0.23	3.9	14.6	145
				SBT	B	14.4	0.34	9.9	28.7	-
				SBR	B	14.0	0.26	0.0	17.6	85

Exhibit 7-12 – 2031 Future Total Conditions Unsignalized Analysis Summary

Intersection	Intersection Delay (s)	Lane	LOS	Delay (s)	V/C Ratio	Synchro Queue Length 95th (m)	Lane Storage (m)
Weekday AM Peak Hour							
Barber Drive/Canal Road & Second Concession Road	7.3	EB 1	A	7.2	-	-	-
		WB 1	A	7.7	-	-	-
		NB 1	A	6.7	-	-	-
		SB 1	A	8.9	-	-	-
Ramey Road & Second Concession Road	2.6	EB 1	A	0.1	0.00	0.0	-
		NB 1	B	10.5	0.06	1.3	-
		SB 1	A	8.8	0.00	0.1	-
Miller Road & Second Concession Road	4.3	EB 1	B	10.3	0.04	0.9	-
		WB 1	B	10.2	0.05	1.1	-
		NB 1	A	0.4	0.00	0.1	-
		SB 1	A	3.3	0.02	0.4	-
Miller Road & Highway 3	1.8	EB 1	A	0.8	-	0.8	0.02
		NB 1	B	13.9	B	13.9	0.04
		SB 1	B	12.8	B	12.8	0.11
Weaver Road/Carl Road & Highway 3	0.1	NB 1	B	14.5	B	14.5	0.01
		SB 1	A	0.0	A	0.0	0.06

Intersection	Intersection Delay (s)	Lane	LOS	Delay (s)	V/C Ratio	Synchro Queue Length 95th (m)	Lane Storage (m)
Weekday PM Peak Hour							
Barber Drive/Canal Road & Second Concession Road	6.8	EB 1	A	7.0	-	-	-
		WB 1	A	7.2	-	-	-
		NB 1	A	6.4	-	-	-
		SB 1	A	7.1	-	-	-
Ramey Road & Second Concession Road	2.3	EB 1	A	0.6	0.00	0.1	-
		NB 1	A	9.4	0.03	0.8	-
		SB 1	A	8.5	0.00	0.1	-
Miller Road & Second Concession Road	3.7	EB 1	A	9.8	0.04	0.9	-
		WB 1	A	9.9	0.05	1.3	-
		NB 1	A	0.2	0.00	0.0	-
		SB 1	A	0.8	0.01	0.1	-
Miller Road & Highway 3	2.3	EB 1	A	0.8	-	0.8	0.02
		NB 1	B	14.5	B	14.5	0.04
		SB 1	B	14.0	B	14.0	0.18
Weaver Road/Carl Road & Highway 3	0.0	NB 1	B	12.2	B	12.2	0.01
		SB 1	A	0.0	A	0.0	0.06

7.3.6 2036 Future Total Conditions Analysis

The results of the intersection capacity analyses under 2036 future total conditions have been presented in **Exhibit 7-13** and **Exhibit 7-14**.

Exhibit 7-13 – 2036 Future Total Conditions Signalized Analysis Summary

Intersection	Intersection			Critical Movement						
	LOS	Delay	V/C Ratio	Mvmt	LOS	Delay (s)	V/C Ratio	50th %tile Queue (m)	95th %tile Queue (m)	Storage Capacity (m)
Weekday AM Peak Hour										
Highway 140 & Second Concession Road	A	6.9	0.55	EBT	B	16.5	0.10	0.8	5.3	-
				WBT	B	17.9	0.31	2.6	11.9	-
				NBL	A	3.9	0.00	0.0	0.5	113
				NBT	A	7.1	0.60	34.0	60.9	-
				NBR	A	4.0	0.04	0.0	3.2	180
				SBL	A	4.3	0.10	1.2	4.4	50
				SBT	A	5.2	0.36	16.6	30.6	-
				SBR	A	3.9	0.01	0.0	0.2	15
Elizabeth Street/Highway 140 & Highway 3	B	13.2	0.59	EBL	B	15.2	0.63	17.9	47.5	160
				EBT	A	9.5	0.20	8.0	21.0	-
				EBR	A	8.6	0.03	0.0	3.7	120
				WBL	A	9.2	0.15	3.9	12.3	150
				WBT	B	10.8	0.40	17.1	40.1	-
				WBR	A	8.8	0.07	0.0	7.0	115
				NBL	B	14.9	0.25	6.0	19.3	110
				NBT	B	17.1	0.54	19.3	50.3	-
				SBL	B	14.1	0.11	2.0	8.7	145
				SBT	B	14.8	0.25	8.3	24.3	-
				SBR	B	14.3	0.16	0.0	14.5	85
Weekday PM Peak Hour										
Highway 140 & Second Concession Road	A	7.1	0.58	EBT	B	18.2	0.12	1.3	6.8	-
				WBT	C	20.1	0.39	4.2	16.1	-
				NBL	A	3.7	0.01	0.1	0.7	113
				NBT	A	5.1	0.39	20.7	37.5	-
				NBR	A	3.7	0.03	0.0	3.1	180
				SBL	A	3.7	0.02	0.3	1.7	50
				SBT	A	7.1	0.62	40.0	71.6	-
				SBR	A	3.6	0.01	0.0	0.3	15

Intersection	Intersection			Critical Movement						
	LOS	Delay	V/C Ratio	Mvmt	LOS	Delay (s)	V/C Ratio	50th %tile Queue (m)	95th %tile Queue (m)	Storage Capacity (m)
Elizabeth Street/Highway 140 & Highway 3	B	12.5	0.5	EBL	B	12.3	0.54	13.7	36.7	160
				EBT	A	9.7	0.33	13.0	31.5	-
				EBR	A	8.3	0.07	0.0	6.8	120
				WBL	A	8.6	0.11	2.2	8.1	150
				WBT	A	9.9	0.35	13.9	33.2	-
				WBR	A	8.2	0.04	0.0	4.9	115
				NBL	B	14.7	0.27	5.3	18.7	110
				NBT	B	15.7	0.45	12.9	38.5	-
				SBL	B	14.6	0.25	4.5	16.5	145
				SBT	B	15.1	0.36	11.4	32.9	-
				SBR	B	14.7	0.28	0.0	18.8	85

Exhibit 7-14 – 2036 Future Total Conditions Unsignalized Analysis Summary

Intersection	Intersection Delay (s)	Lane	LOS	Delay (s)	V/C Ratio	Synchro Queue Length 95th (m)	Lane Storage (m)
Weekday AM Peak Hour							
Barber Drive/Canal Road & Second Concession Road	7.3	EB 1	A	7.2	-	-	-
		WB 1	A	7.7	-	-	-
		NB 1	A	6.7	-	-	-
		SB 1	A	8.9	-	-	-
Ramey Road & Second Concession Road	0.5	EB 1	A	0.1	0.00	0.0	-
		NB 1	B	10.3	0.01	0.1	-
		SB 1	A	8.9	0.00	0.1	-
Miller Road & Second Concession Road	4.3	EB 1	B	10.4	0.04	1.0	-
		WB 1	B	10.2	0.05	1.2	-
		NB 1	A	0.4	0.00	0.1	-
		SB 1	A	3.3	0.02	0.4	-
Miller Road & Highway 3	1.9	EB 1	A	0.8	-	0.8	0.02
		NB 1	B	14.7	B	14.7	0.05
		SB 1	B	13.5	B	13.5	0.12
Weaver Road/Carl Road & Highway 3	0.6	NB 1	C	16.4	C	16.4	0.02
		SB 1	B	11.6	B	11.6	0.06

Intersection	Intersection Delay (s)	Lane	LOS	Delay (s)	V/C Ratio	Synchro Queue Length 95th (m)	Lane Storage (m)
Weekday PM Peak Hour							
Barber Drive/Canal Road & Second Concession Road	6.8	EB 1	A	7.0	-	-	-
		WB 1	A	7.2	-	-	-
		NB 1	A	6.4	-	-	-
		SB 1	A	7.1	-	-	-
Ramey Road & Second Concession Road	2.1	EB 1	A	0.6	0.00	0.1	-
		NB 1	A	9.5	0.03	0.8	-
		SB 1	A	8.6	0.00	0.1	-
Miller Road & Second Concession Road	3.8	EB 1	A	10.0	0.04	0.9	-
		WB 1	A	10.0	0.06	1.5	-
		NB 1	A	0.3	0.00	0.0	-
		SB 1	A	0.9	0.01	0.1	-
Miller Road & Highway 3	2.4	EB 1	A	0.8	-	0.8	0.02
		NB 1	B	15.0	B	15.0	0.04
		SB 1	B	14.8	B	14.8	0.21
Weaver Road/Carl Road & Highway 3	0.0	NB 1	B	12.7	B	12.7	0.01
		SB 1	A	0.0	A	0.0	0.06

7.3.7 2041 Future Total Conditions Analysis

The results of the intersection capacity analyses under 2041 future total conditions have been presented in **Exhibit 7-15** and **Exhibit 7-16**.

Exhibit 7-15 – 2041 Future Total Conditions Signalized Analysis Summary

Intersection	Intersection			Critical Movement						
	LOS	Delay	V/C Ratio	Mvmt	LOS	Delay (s)	V/C Ratio	50th %tile Queue (m)	95th %tile Queue (m)	Storage Capacity (m)
Weekday AM Peak Hour										
Highway 140 & Second Concession Road	A	7.1	0.58	EBT	B	17.5	0.11	0.9	5.6	-
				WBT	B	19.1	0.34	2.9	13.3	-
				NBL	A	3.7	0.00	0.0	0.5	113
				NBT	A	7.2	0.62	37.9	67.6	-
				NBR	A	3.8	0.03	0.0	2.4	180
				SBL	A	4.0	0.05	0.6	2.7	50
				SBT	A	5.2	0.39	19.1	34.8	-
				SBR	A	3.7	0.01	0.0	0.1	15
Elizabeth Street/Highway 140 & Highway 3	B	13.7	0.61	EBL	B	16.0	0.64	19.2	50.8	160
				EBT	A	9.9	0.24	10.0	25.2	-
				EBR	A	8.8	0.03	0.0	4.0	120
				WBL	A	9.5	0.16	4.4	13.6	150
				WBT	B	11.3	0.43	19.5	45.0	-
				WBR	A	9.0	0.07	0.0	7.3	115
				NBL	B	15.3	0.27	6.9	20.7	110
				NBT	B	17.9	0.57	22.4	54.1	-
				SBL	B	14.9	0.18	3.4	12.3	145
				SBT	B	15.2	0.26	9.4	25.6	-
				SBR	B	14.7	0.18	0.0	14.8	85
Weekday PM Peak Hour										
Highway 140 & Second Concession Road	A	7.3	0.62	EBT	B	19.4	0.13	1.4	7.3	-
				WBT	C	21.7	0.44	4.7	18.2	-
				NBL	A	3.5	0.01	0.1	0.7	113
				NBT	A	5.0	0.41	22.7	40.7	-
				NBR	A	3.6	0.04	0.0	3.2	180
				SBL	A	3.5	0.02	0.4	1.8	50
				SBT	A	7.3	0.65	45.3	80.8	-
				SBR	A	3.5	0.01	0.0	0.2	15

Intersection	Intersection			Critical Movement						
	LOS	Delay	V/C Ratio	Mvmt	LOS	Delay (s)	V/C Ratio	50th %tile Queue (m)	95th %tile Queue (m)	Storage Capacity (m)
Elizabeth Street/Highway 140 & Highway 3	B	13.2	0.54	EBL	B	13.3	0.58	15.8	44.2	160
				EBT	B	10.0	0.35	14.9	37.2	-
				EBR	A	8.5	0.08	0.0	7.5	120
				WBL	A	8.7	0.11	2.5	9.3	150
				WBT	B	10.2	0.37	15.9	39.2	-
				WBR	A	8.3	0.04	0.0	5.5	115
				NBL	B	15.3	0.28	6.3	20.1	110
				NBT	B	16.4	0.48	15.7	42.6	-
				SBL	B	15.2	0.27	5.3	17.9	145
				SBT	B	15.7	0.38	13.5	35.7	-
				SBR	B	15.6	0.36	2.3	25.1	85

Exhibit 7-16 – 2041 Future Total Conditions Unsignalized Analysis Summary

Intersection	Intersection Delay (s)	Lane	LOS	Delay (s)	V/C Ratio	Synchro Queue Length 95th (m)	Lane Storage (m)
Weekday AM Peak Hour							
Barber Drive/Canal Road & Second Concession Road	7.3	EB 1	A	7.2	-	-	-
		WB 1	A	7.7	-	-	-
		NB 1	A	6.7	-	-	-
		SB 1	A	8.9	-	-	-
Ramey Road & Second Concession Road	0.7	EB 1	A	0.2	0.00	0.0	-
		NB 1	B	10.2	0.01	0.1	-
		SB 1	A	8.9	0.00	0.1	-
Miller Road & Second Concession Road	4.4	EB 1	B	10.6	0.05	1.1	-
		WB 1	B	10.4	0.06	1.4	-
		NB 1	A	0.4	0.00	0.1	-
		SB 1	A	3.3	0.02	0.5	-
Miller Road & Highway 3	2.0	EB 1	A	0.9	-	0.9	0.02
		NB 1	C	15.6	C	15.6	0.06
		SB 1	B	14.2	B	14.2	0.14
Weaver Road/Carl Road & Highway 3	1.0	EB 1	A	1.1	-	1.1	0.03
		NB 1	C	18.9	C	18.9	0.02
		SB 1	B	12.1	B	12.1	0.06

Intersection	Intersection Delay (s)	Lane	LOS	Delay (s)	V/C Ratio	Synchro Queue Length 95th (m)	Lane Storage (m)
Weekday PM Peak Hour							
Barber Drive/Canal Road & Second Concession Road	6.8	EB 1	A	7.0	-	-	-
		WB 1	A	7.2	-	-	-
		NB 1	A	6.4	-	-	-
		SB 1	A	7.1	-	-	-
Ramey Road & Second Concession Road	2.0	EB 1	A	0.6	0.00	0.1	-
		NB 1	A	9.5	0.03	0.8	-
		SB 1	A	8.6	0.00	0.1	-
Miller Road & Second Concession Road	3.8	EB 1	B	10.1	0.04	1.0	-
		WB 1	B	10.1	0.07	1.6	-
		NB 1	A	0.3	0.00	0.0	-
		SB 1	A	0.9	0.01	0.1	-
Miller Road & Highway 3	2.5	EB 1	A	0.9	-	0.9	0.02
		NB 1	C	15.9	C	15.9	0.05
		SB 1	C	15.8	C	15.8	0.24
Weaver Road/Carl Road & Highway 3	0.0	NB 1	B	13.3	B	13.3	0.01
		SB 1	A	0.0	A	0.0	0.06

7.3.8 Summary of Intersection Capacity Analysis

The results of the intersection capacity analyses indicate that all of the study area intersections are expected to operate at an acceptable Level of Service (LOS 'D' or better and v/c < 0.85) within the 2041 horizon year of this study.

8 Scenario 2 Traffic Analysis (Welland Canal Dock)

Based on discussions with Port Colborne Quarries Inc. (PCQI) staff, several times a year, Port Colborne Quarries will send approximately 50 truck loads per day over a 3-day period to the dock on Welland Canal at the western terminus of Second Concession Road. This represents a substantial change in trip distribution and therefore a secondary analysis has been conducted to evaluate this non-typical situation. This secondary analysis is limited to evaluating the operational performance of the study area intersections under 2041 future total traffic conditions.

8.1 Trip Distribution and Assignment

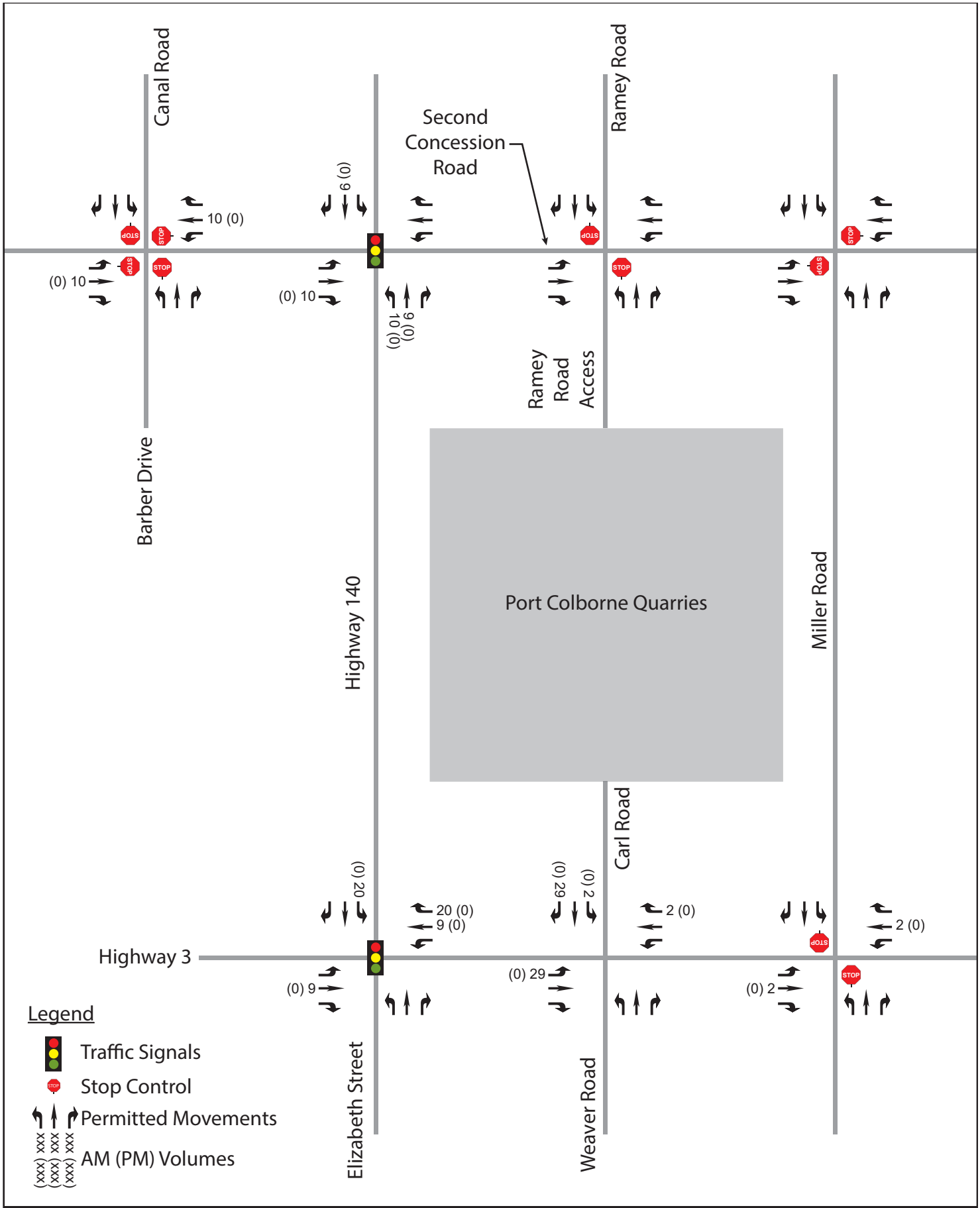
Based on the figures provided in Section 6.4, it has been calculated that an average of approximately 154 truck trips are generated by the subject site per day. As such, only a third of all daily truck trips would be diverted to the dock at the western terminus of Second Concession Road with the remaining two thirds assumed to be following the same quarry related trip distribution as described before in Section 6.5. It is assumed that the arrival and departure of these 50 trucks are

evenly distributed throughout the workday. Based on the above assumptions, the following trip distribution has been assumed for the 2041 analysis year:

- 100% inbound and outbound trips via Highway 3 access:
    - 100% to/from the West via Second Concession Road.

The above trip distribution applies only for the portion of truck trips that are diverted to the Welland Canal dock at the western terminus of Second Concession Road.

Using the above distribution and the distribution from Section 6.5, the estimated 2041 site-generated peak hour traffic volumes were assigned to the adjacent road network, as shown in **Exhibit 8-1**.



Port Colborne Quarries
Pit 3 Expansion
Traffic Impact Study

Exhibit 8-1:
2041 Scenario 2
Site-Generated
Traffic

PROJECT No. 115774
DATE: October 2020
SCALE: N.T.S.

8.2 2041 Future Total Scenario 2 Conditions Analysis

The estimated 2041 Scenario 2 site-generated peak hour traffic volumes were added to the 2041 future background traffic volumes to establish the 2041 future total Scenario 2 traffic volumes, as shown in **Exhibit 8-4** below.

Using the operational criteria from **Section 7.2**, the intersection capacity analysis was completed using the weekday morning and afternoon peak hour traffic volumes shown in **Exhibit 8-4**. The results of the intersection capacity analysis under 2041 future total Scenario 2 conditions have been presented in **Exhibit 8-2** and **Exhibit 8-3**.

Exhibit 8-2 – 2041 Future Total Scenario 2 Conditions Signalized Analysis Summary

Intersection	Intersection			Critical Movement						
	LOS	Delay	V/C Ratio	Mvmt	LOS	Delay (s)	V/C Ratio	50th %tile Queue (m)	95th %tile Queue (m)	Storage Capacity (m)
Weekday AM Peak Hour										
Highway 140 & Second Concession Road	A	7.2	0.57	EBT	B	17.4	0.11	0.9	6.9	-
				WBT	B	19.0	0.34	2.9	13.2	-
				NBL	A	3.8	0.02	0.4	2.1	113
				NBT	A	7.2	0.62	37.5	67.2	-
				NBR	A	3.8	0.03	0.0	2.4	180
				SBL	A	4.0	0.05	0.6	2.7	50
				SBT	A	5.2	0.39	18.9	34.5	-
				SBR	A	3.7	0.01	0.0	0.2	15
Elizabeth Street/Highway 140 & Highway 3	B	13.7	0.61	EBL	B	16.1	0.65	19.1	50.7	160
				EBT	A	9.9	0.23	9.6	24.5	-
				EBR	A	8.9	0.03	0.0	4.0	120
				WBL	A	9.6	0.16	4.4	13.6	150
				WBT	B	11.3	0.42	18.9	44.0	-
				WBR	A	9.1	0.08	0.0	7.5	115
				NBL	B	15.2	0.27	6.8	20.7	110
				NBT	B	17.7	0.56	22.0	54.1	-
				SBL	B	14.9	0.20	3.7	13.4	145
				SBT	B	15.0	0.26	9.3	25.6	-
				SBR	B	14.6	0.18	0.0	14.8	85

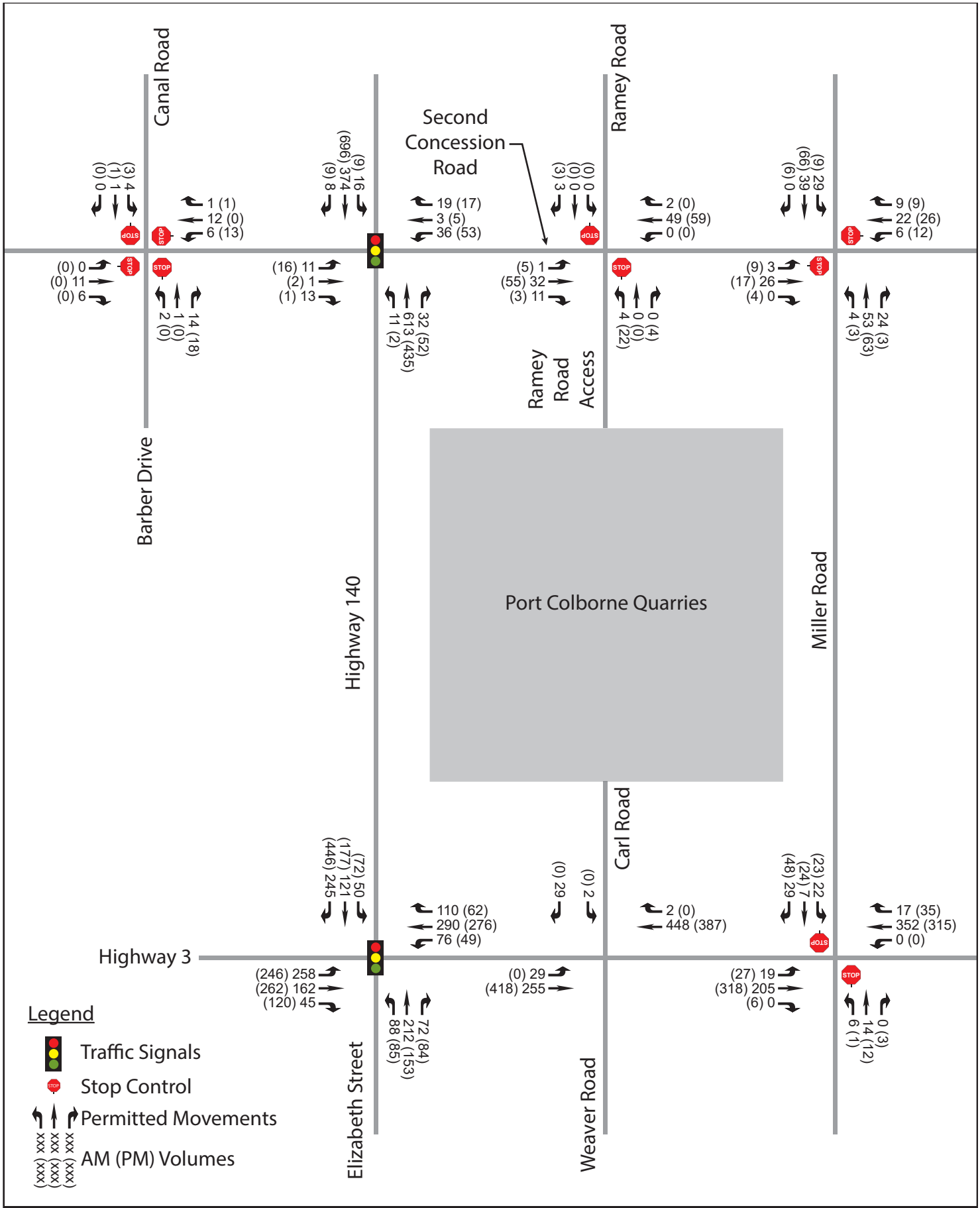
Intersection	Intersection			Critical Movement						
	LOS	Delay	V/C Ratio	Mvmt	LOS	Delay (s)	V/C Ratio	50th %tile Queue (m)	95th %tile Queue (m)	Storage Capacity (m)
Weekday PM Peak Hour										
Highway 140 & Second Concession Road	A	7.3	0.62	EBT	B	19.4	0.13	1.4	7.3	-
				WBT	C	21.7	0.44	4.7	18.2	-
				NBL	A	3.5	0.01	0.1	0.7	113
				NBT	A	5.0	0.41	22.7	40.7	-
				NBR	A	3.6	0.04	0.0	3.2	180
				SBL	A	3.5	0.02	0.4	1.8	50
				SBT	A	7.3	0.65	45.3	80.8	-
				SBR	A	3.5	0.01	0.0	0.2	15
Elizabeth Street/Highway 140 & Highway 3	B	13.2	0.54	EBL	B	13.3	0.58	15.8	44.2	160
				EBT	B	10.0	0.35	14.9	37.2	-
				EBR	A	8.5	0.08	0.0	7.5	120
				WBL	A	8.7	0.11	2.5	9.3	150
				WBT	B	10.2	0.37	15.9	39.2	-
				WBR	A	8.3	0.04	0.0	5.5	115
				NBL	B	15.3	0.28	6.3	20.1	110
				NBT	B	16.4	0.48	15.7	42.6	-
				SBL	B	15.2	0.27	5.3	17.9	145
				SBT	B	15.7	0.38	13.5	35.7	-
				SBR	B	15.6	0.36	2.3	25.1	85

Exhibit 8-3 – 2041 Future Total Scenario 2 Conditions Unsignalized Analysis Summary

Intersection	Intersection Delay (s)	Lane	LOS	Delay (s)	V/C Ratio	Synchro Queue Length 95th (m)	Lane Storage (m)
Weekday AM Peak Hour							
Barber Drive/Canal Road & Second Concession Road	7.6	EB 1	A	8.2	-	-	-
		WB 1	A	7.4	-	-	-
		NB 1	A	6.8	-	-	-
		SB 1	A	8.9	-	-	-
Ramey Road & Second Concession Road	0.7	EB 1	A	0.2	0.00	0.0	-
		NB 1	B	10.2	0.01	0.1	-
		SB 1	A	8.9	0.00	0.1	-

Intersection	Intersection Delay (s)	Lane	LOS	Delay (s)	V/C Ratio	Synchro Queue Length 95th (m)	Lane Storage (m)
Miller Road & Second Concession Road	4.4	EB 1	B	10.6	0.05	1.1	-
		WB 1	B	10.4	0.06	1.4	-
		NB 1	A	0.4	0.00	0.1	-
		SB 1	A	3.3	0.02	0.5	-
Miller Road & Highway 3	2.0	EB 1	A	0.9	-	0.9	0.02
		NB 1	C	15.6	C	15.6	0.06
		SB 1	B	14.2	B	14.2	0.14
Weaver Road/Carl Road & Highway 3	1.0	EB 1	A	1.1	-	1.1	0.03
		NB 1	C	19.1	C	19.1	0.02
		SB 1	B	11.9	B	11.9	0.06
Weekday PM Peak Hour							
Barber Drive/Canal Road & Second Concession Road	6.8	EB 1	A	7.0	-	-	-
		WB 1	A	7.2	-	-	-
		NB 1	A	6.4	-	-	-
		SB 1	A	7.1	-	-	-
Ramey Road & Second Concession Road	2.0	EB 1	A	0.6	0.00	0.1	-
		NB 1	A	9.5	0.03	0.8	-
		SB 1	A	8.6	0.00	0.1	-
Miller Road & Second Concession Road	3.8	EB 1	B	10.1	0.04	1.0	-
		WB 1	B	10.1	0.07	1.6	-
		NB 1	A	0.3	0.00	0.0	-
		SB 1	A	0.9	0.01	0.1	-
Miller Road & Highway 3	2.5	EB 1	A	0.9	-	0.9	0.02
		NB 1	C	15.9	C	15.9	0.05
		SB 1	C	15.8	C	15.8	0.24
Weaver Road/Carl Road & Highway 3	0.0	NB 1	B	13.3	B	13.3	0.01
		SB 1	A	0.0	A	0.0	0.06

The results in the table above indicate that all study area intersections are expected to operate within acceptable Level of Service and delay thresholds under 2041 future total Scenario 2 traffic conditions.



Port Colborne Quarries
Pit 3 Expansion
Traffic Impact Study

Exhibit 8-4:
2041 Future Total
Scenario 2 Traffic

PROJECT No. 115774
DATE: October 2020
SCALE: N.T.S.

9 Geometric Analyses

9.1 Sight Distance

Horizontal or vertical curves in a road may obstruct the line of sight of a vehicle turning from a side street, which increases the risk of a collision. As a result, the proposed access on Highway 3 was assessed for appropriate sight distances. Based on a preliminary desktop review using Google Streetview imagery, there are no apparent horizontal or vertical curves on Highway 3 that would impact vehicle line of sight and, therefore, there are no concerns with the proposed site access location. Based on an assumed operating speed of 90 km/h on Highway 3, a minimum stopping sight distance of 190m will be required for a truck to safely make a left turn out of the site. Proper care should be taken to ensure no obstructions are placed in the line-of-sight in the vicinity of the proposed access. Site distance should be confirmed in the field prior to construction.

9.2 Auxiliary Lane Analyses

9.2.1 Left-Turn Lanes

9.2.1.1 Signalized Intersections

According to the results of the intersection capacity analysis presented, all signalized intersections within the study area are projected to operate at acceptable Levels of Service within the horizon year of this study with no need for additional left-turn auxiliary lanes.

Based on the Synchro analysis results under 2041 future total conditions, the anticipated ultimate left-turn auxiliary lane requirements at signalized intersections are shown below in **Exhibit 9-1**. The longest 95th percentile queue for either the morning or afternoon peak period was recorded and combined with the required deceleration length from TAC's Geometric Design Guide for Canadian Roads and compared with existing or expected future auxiliary lane lengths. Any required intersection modifications resulting from the intersection capacity analysis were included in this analysis. Any deficiencies were identified with additional auxiliary lane length recommendations noted. The results do not include taper length requirements.

The TAC design guide indicates that for 90 km/h and 70 km/h design speeds, a deceleration length of 106.2 m and 62.2 m are required, respectively. Typically, 2/3 of the taper area can be used for deceleration with the remaining deceleration (if any) occurring in the auxiliary lane. The auxiliary lane length must be equal to or greater than the storage length and the deceleration length combined.

Exhibit 9-1 - Auxiliary Left-Turn Auxiliary Lane Requirements at Signalized Intersections

INTERSECTION	APPROACH	EXISTING AUXILIARY LENGTH (m)	REQUIRED STORAGE LENGTH[1] (m)	DECELE-RATION LENGTH[2] (m)	LANE DEFICIENCY (m)
Highway 140 / Second Concession Road	NB	115	0	70	-
	SB	50	5	45	-
Highway 140 / Highway 3	NB	110	20	0	-
	SB	145	20	0	-
	EB	150	50	10	-
	WB	160	15	0	-

Notes:
1- At signalized intersections, left-turn lane requirements are based on the 95th percentile queue length from the intersection capacity analysis.
2- Assumes 2/3 of the existing taper is used for deceleration.

The results from the left-turn auxiliary lane analysis indicate that the existing left-turn lanes at both signalized intersections are sufficiently long to accommodate the projected storage and deceleration requirements.

9.2.1.2 Unsignalized Intersections

The MTO left-turn warrant procedure for 2-lane highways was completed for all two-way stop-controlled intersections within the study area. The left-turn lane warrant analyses have been provided in **Appendix D**. Based on the auxiliary lane analysis, a left-turn lane with a minimum 15m of storage is warranted in the eastbound direction at the Highway 3 access under 2041 future total conditions. Per the MTO Design Supplement to the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads, an additional 15m of storage is recommended due to the volume of trucks expected to make this left-turn movement. For a design speed of 90 km/h, trucks require a minimum of 106.2m of deceleration/braking distance on a relatively flat grade. Assuming a taper of 150m which is within an appropriate range for the design speed of this road, and that 2/3 of deceleration is likely to occur over this region, the resulting minimum length (storage plus deceleration) for a left-turn auxiliary lane on Highway 3 at the proposed site access should be at least 35 metres, plus taper.

Note that the warrant for the eastbound left-turn lane is only triggered once Pit 1 is fully decommissioned. It is expected that Pit 1 will be fully backfilled by 2039. Once Pit 1 has been fully backfilled, it is expected that all inbound trucks will enter the site using the Highway 3 access which triggers the warrant for the left-turn lane at this time.

9.2.2 Right-Turn Lanes

9.2.2.1 Signalized Intersections

The Transportation Association of Canada's (TAC) Geometric Design Guide for Canadian Roads indicates that, at signalized intersections, a right-turn lane should be considered when the volume of right-turning traffic is 10% to 20% of the total approaching volume and exceeds 60 vehicles per hour. Based on the above, a right-turn lane may be considered for the northbound movement at the Highway 140 / Highway 3 intersection, although since it is not required in terms of intersection capacity it is not recommended.

The auxiliary lane length must be equal to or greater than the storage length and the deceleration length combined. **Exhibit 9-2** summarizes the right-turn auxiliary lane length requirements for signalized intersections within the study area and is limited to the right-turn movements for which a right-turn lane is recommended or currently exists. The results do not include taper length requirements.

Exhibit 9-2 - Auxiliary Right-Turn Auxiliary Lane Requirements at Signalized Intersections

INTERSECTION	APPROACH	EXISTING AUXILIARY LENGTH (m)	REQUIRED STORAGE LENGTH[1] (m)	DECELE-RATION LENGTH[2] (m)	LANE DEFICIENCY (m)
Highway 140 / Second Concession Road	NB	180	15	70	-
	SB	0	5	50	55
Highway 140 / Highway 3	SB[3]	85	25	0	-
	EB[3]	120	10	20	-
	WB	115	35	0	-

Notes:

1- At signalized intersections, right-turn lane requirements are based on the higher value as determined by the 95th percentile queue length from the intersection capacity analysis or the following equation:

$$S = \frac{N \cdot L}{C} \cdot 1.5^{*}$$

Where:
N = projected hourly volume of vehicles
L = 7m average vehicle queue allotment
C = number of signal cycles per hour
** note: A factor of safety of 2.0 is used for operating speeds over 60 km/h.*

2- Assumes 2/3 of the existing taper is used for deceleration.

3- Movement is channelized. 95th percentile queue length reported and rounded to nearest 5m increment

At the Highway 140 & Second Concession Road intersection, the southbound right-turn has a taper only and is not sufficiently long enough for vehicles to decelerate. As such, it is recommended that the taper be lengthened to address this deficiency. It should be noted however that this deficiency is an existing condition and the activities of Port Colborne Quarries are not expected to contribute additional traffic to this movement.

9.2.2.2 Unsignalized Intersections

For unsignalized intersections, the TAC design guide indicates that when the volume of right-turning traffic relative to the volume of through traffic causes undue hazard a right-turn lane should be considered. With consideration of the posted speed limit and projected traffic volumes under 2041 future total conditions, none of the unsignalized intersections are likely to require the addition of a right-turn auxiliary lane. In particular, the volume of right-turning traffic at the Highway 3 access is expected to be low during the weekday peak hours, therefore, a right-turn lane or taper is not recommended at this location.

10 Conclusions and Recommendations

Based on an annual extraction rate of 1,000,000 tonnes per year, it is estimated that Port Colborne Quarries will generate approximately 154 trucks per day and 15.4 trucks during the morning peak hour. Intersection capacity analysis was conducted for all study area intersections under existing (2019) traffic conditions and future (2031, 2036 & 2041) background and total traffic conditions. All study area intersections were shown to operate at an acceptable Level of Service in all scenarios (LOS 'D' or better and v/c < 0.85). Auxiliary left- and right-turn lane analyses were completed, with all lane deficiencies were noted. No geometric modifications or traffic signalization will be required at any of the study area intersections, except for at the Highway 3 access, where an auxiliary left-turn lane will be required to accommodate the proposed Pit 3 expansion, and at the Highway 140 & Second Concession Road intersection where the existing southbound right-turn taper was found to be insufficiently long to provide the recommended deceleration lenth.

The overall conclusion of this Traffic Impact Study is that the traffic generated by the proposed Port Colborne Quarries Pit 3 expansion can be safely accommodated on the adjacent road network with consideration of the recommendations made.

The following table outlines the recommended modifications for each intersection.

Exhibit 10-1 - Summary of Recommended Actions / Modifications

RECOMMENDED ACTIONS / MODIFICATIONS
Highway 3 Access Intersection: • Construct a minimum 35m long eastbound left-turn lane by 2039 (or upon completion of Pit 1 backfilling) to accommodate quarry-related traffic reassigned to the proposed Highway 3 access. **Highway 140 & Second Concession Road Intersection:** • Increase the length of the southbound right-turn taper to provide sufficient space for deceleration. It should be noted that this deficiency is an existing condition that will not be impacted by traffic associated with the proposed development. *Note: the above recommendation does not include the taper length and shall be confirmed at detailed design.*

11 Professional Authorization

Prepared By:

Eric McLaren, EIT
Engineering Intern - Transportation

Reviewed By:

David Hook, P.Eng.
Project Manager - Transportation

Appendix A – Traffic Data

Ontario Traffic Inc.

Morning Peak Diagram

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

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

Municipality: Port Colborne
Site #: 1904000001
Intersection: Second Concession Rd & Barber D
TFR File #: 1
Count date: 28-Feb-19

Weather conditions:

Person(s) who counted:

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

Major Road: Second Concession Rd runs W/E

North Leg Total:	7
North Entering:	5
North Peds:	0
Peds Cross:	⋈

Heavys	0	0	0	0
Trucks	0	1	4	5
Cars	0	0	0	0
Totals	0	1	4	

Heavys	0
Trucks	2
Cars	0
Totals	2

East Leg Total:	28
East Entering:	9
East Peds:	0
Peds Cross:	⧖

Canal Rd

Heavys	Trucks	Cars	Totals
0	1	3	4

Cars	Trucks	Heavys	Totals
0	1	0	1
2	0	0	2
4	2	0	6
6	3	0	

Private Lot

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	0	0
0	1	0	1
0	2	4	6
0	3	4	

Second Concession Rd

Cars	Trucks	Heavys	Totals
14	5	0	19

Barber Dr

Peds Cross:	⧖
West Peds:	0
West Entering:	7
West Leg Total:	11

Cars	8			
Trucks	5			
Heavys	0			
Totals	13			

Cars	1	0	14	15
Trucks	1	1	0	2
Heavys	0	0	0	0
Totals	2	1	14	

Peds Cross:	⋈
South Peds:	0
South Entering:	17
South Leg Total:	30

Comments

Ontario Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:00:00

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

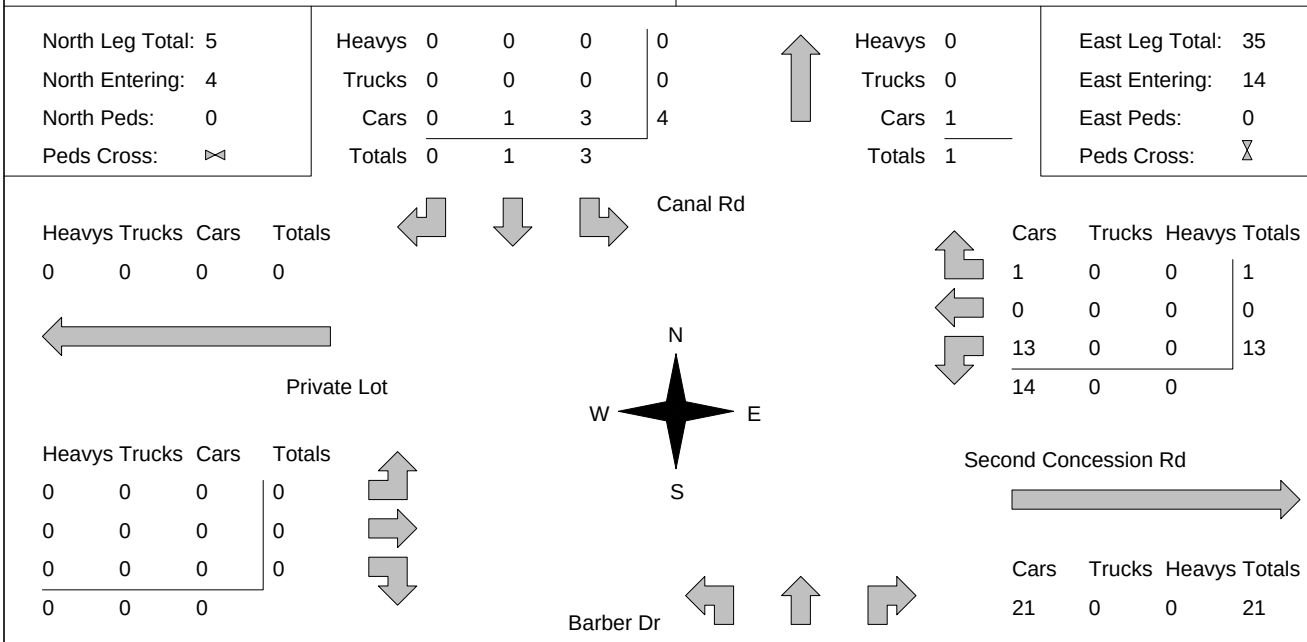
Municipality: Port Colborne
Site #: 1904000001
Intersection: Second Concession Rd & Barber D
TFR File #: 1
Count date: 28-Feb-19

Weather conditions:

Person(s) who counted:

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

Major Road: Second Concession Rd runs W/E



Comments

Ontario Traffic Inc.

Morning Peak Diagram

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

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

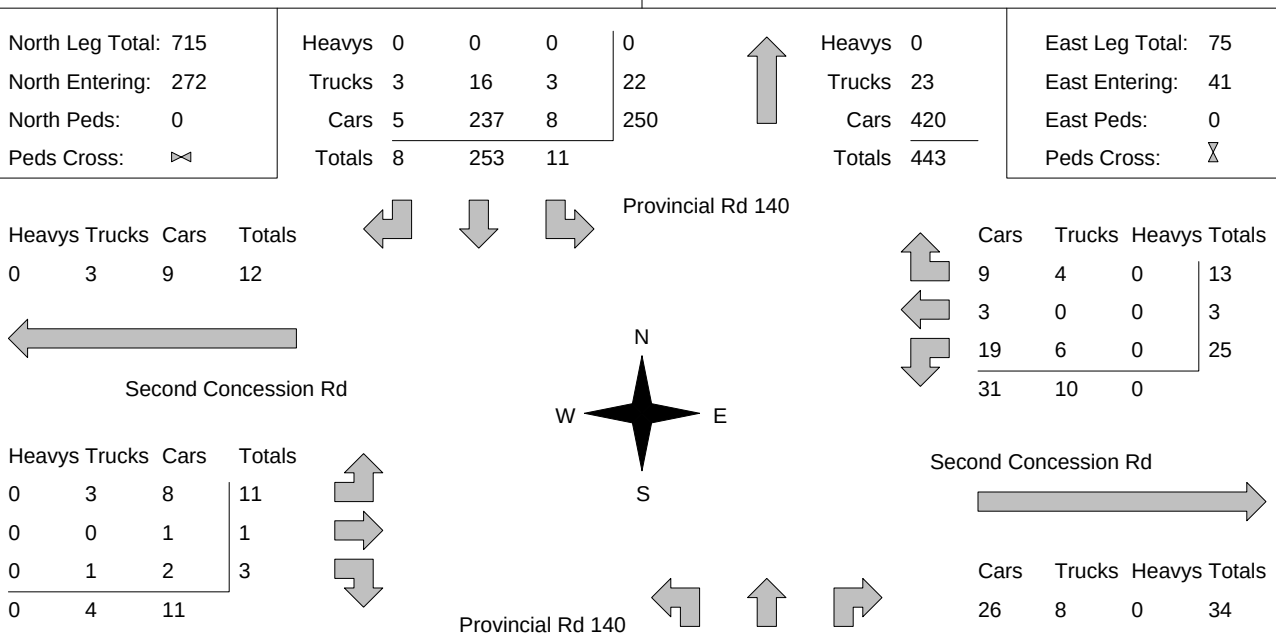
Municipality: Port Colborne
Site #: 1904000002
Intersection: Provincial Rd 140 & Second Conce
TFR File #: 1
Count date: 28-Feb-19

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Provincial Rd 140 runs N/S



Comments

Ontario Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:00:00

One Hour Peak
From: 16:15:00
To: 17:15:00

Municipality: Port Colborne
Site #: 1904000002
Intersection: Provincial Rd 140 & Second Conce
TFR File #: 1
Count date: 28-Feb-19

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Provincial Rd 140 runs N/S

North Leg Total:	828
North Entering:	498
North Peds:	0
Peds Cross:	⋈

Heavys	0	0	0	0
Trucks	1	7	1	9
Cars	8	476	5	489
Totals	9	483	6	

Heavys	0
Trucks	8
Cars	322
Totals	330

East Leg Total:	98
East Entering:	54
East Peds:	0
Peds Cross:	⧖

Provincial Rd 140

Heavys	Trucks	Cars	Totals
0	2	14	16

Second Concession Rd

Cars	Trucks	Heavys	Totals
10	2	0	12
5	0	0	5
37	0	0	37
52	2	0	

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	16	16
0	0	2	2
0	0	1	1
0	0	19	

Second Concession Rd

Cars	Trucks	Heavys	Totals
41	3	0	44

Provincial Rd 140

Peds Cross:	⧖
West Peds:	0
West Entering:	19
West Leg Total:	35

Cars	514
Trucks	7
Heavys	0
Totals	521

Cars	1	296	34	331
Trucks	1	6	2	9
Heavys	0	0	0	0
Totals	2	302	36	

Peds Cross:	⋈
South Peds:	0
South Entering:	340
South Leg Total:	861

Comments

Ontario Traffic Inc.

Morning Peak Diagram

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

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

Municipality: Port Colborne
Site #: 1904000003
Intersection: Second Concession & Ramey Rd (
TFR File #: 1
Count date: 28-Feb-19

Weather conditions:

Person(s) who counted:

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

Major Road: Second Concession runs W/E

North Leg Total: 6
North Entering: 3
North Peds: 0
Peds Cross: ⋈

Heavys	0	0	0	0
Trucks	1	0	0	1
Cars	2	0	0	2
Totals	3	0	0	

Heavys	0
Trucks	1
Cars	2
Totals	3

East Leg Total: 58
East Entering: 36
East Peds: 0
Peds Cross: ⧖

Heavys	Trucks	Cars	Totals
0	10	31	41

Ramey Rd

Cars	Trucks	Heavys	Totals
1	1	0	2
29	5	0	34
0	0	0	0
30	6	0	

Second Concession

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	1	1
0	3	19	22
0	5	6	11
0	8	26	

Second Concession

Cars	Trucks	Heavys	Totals
19	3	0	22

Ramey Rd (Current PCQ access)

Peds Cross: ⧖
West Peds: 0
West Entering: 34
West Leg Total: 75

Cars	6			
Trucks	5			
Heavys	0			
Totals	11			

Cars	0	0	0	0
Trucks	4	0	0	4
Heavys	0	0	0	0
Totals	4	0	0	

Peds Cross: ⋈
South Peds: 0
South Entering: 4
South Leg Total: 15

Comments

Ontario Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:00:00

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

Municipality: Port Colborne
Site #: 1904000003
Intersection: Second Concession & Ramey Rd (
TFR File #: 1
Count date: 28-Feb-19

Weather conditions:

Person(s) who counted:

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

Major Road: Second Concession runs W/E

North Leg Total:	8			
North Entering:	3			
North Peds:	0			
Peds Cross:	⋈			
Heavys	0	0	0	0
Trucks	0	0	0	0
Cars	3	0	0	3
Totals	3	0	0	
Heavys	0			
Trucks	0			
Cars	5			
Totals	5			
East Leg Total:	83			
East Entering:	41			
East Peds:	0			
Peds Cross:	⧖			

Ramey Rd

Heavys	Trucks	Cars	Totals
0	4	62	66

	Cars	Trucks	Heavys	Totals
	0	0	0	0
	40	1	0	41
	0	0	0	0
	40	1	0	

Second Concession

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	5	5
0	1	37	38
0	3	0	3
0	4	42	

Second Concession

Cars	Trucks	Heavys	Totals
41	1	0	42

Ramey Rd (Current PCQ access)

Peds Cross:	⧖			
West Peds:	0			
West Entering:	46			
West Leg Total:	112			
Cars	0			
Trucks	3			
Heavys	0			
Totals	3			
Cars	19	0	4	23
Trucks	3	0	0	3
Heavys	0	0	0	0
Totals	22	0	4	
Peds Cross:	⋈			
South Peds:	0			
South Entering:	26			
South Leg Total:	29			

Comments

Ontario Traffic Inc.

Morning Peak Diagram

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

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

Municipality: Port Colborne
Site #: 1904000004
Intersection: Miller Rd & Second Concession Rd
TFR File #: 1
Count date: 28-Feb-19

Weather conditions:

Person(s) who counted:

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

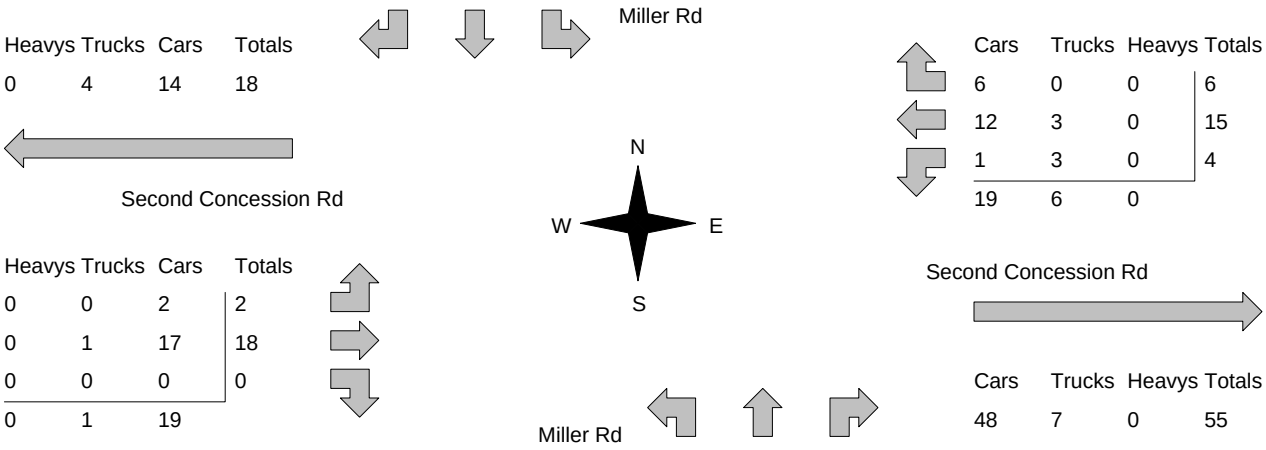
Major Road: Miller Rd runs N/S

North Leg Total:	92
North Entering:	47
North Peds:	0
Peds Cross:	⋈

Heavys	0	0	0	0
Trucks	0	3	1	4
Cars	0	24	19	43
Totals	0	27	20	

Heavys	0
Trucks	2
Cars	43
Totals	45

East Leg Total:	80
East Entering:	25
East Peds:	0
Peds Cross:	⧖



Peds Cross:	⧖
West Peds:	0
West Entering:	20
West Leg Total:	38

Cars	25			
Trucks	6			
Heavys	0			
Totals	31			

Cars	2	35	12	49
Trucks	1	2	5	8
Heavys	0	0	0	0
Totals	3	37	17	

Peds Cross:	⋈
South Peds:	0
South Entering:	57
South Leg Total:	88

Comments

Ontario Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:00:00

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

Municipality: Port Colborne
Site #: 1904000004
Intersection: Miller Rd & Second Concession Rd
TFR File #: 1
Count date: 28-Feb-19

Weather conditions:

Person(s) who counted:

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

Major Road: Miller Rd runs N/S

North Leg Total:	113			
North Entering:	57			
North Peds:	0			
Peds Cross:	⋈			
Heavys	0	0	0	0
Trucks	0	1	0	1
Cars	4	46	6	56
Totals	4	47	6	
Heavys	0			
Trucks	2			
Cars	54			
Totals	56			
East Leg Total:	52			
East Entering:	32			
East Peds:	0			
Peds Cross:	⧖			

Miller Rd

Heavys	Trucks	Cars	Totals
0	0	24	24

Second Concession Rd

Cars	Trucks	Heavys	Totals
5	1	0	6
18	0	0	18
7	1	0	8
30	2	0	

N
W E
S

Heavys	Trucks	Cars	Totals
0	0	6	6
0	1	11	12
0	0	3	3
0	1	20	

Second Concession Rd

Cars	Trucks	Heavys	Totals
19	1	0	20

Miller Rd

Peds Cross:	⧖			
West Peds:	0			
West Entering:	21			
West Leg Total:	45			
Cars	56			
Trucks	2			
Heavys	0			
Totals	58			
Cars	2	43	2	47
Trucks	0	1	0	1
Heavys	0	0	0	0
Totals	2	44	2	
Peds Cross:	⋈			
South Peds:	0			
South Entering:	48			
South Leg Total:	106			

Comments

Ontario Traffic Inc.

Morning Peak Diagram

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

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

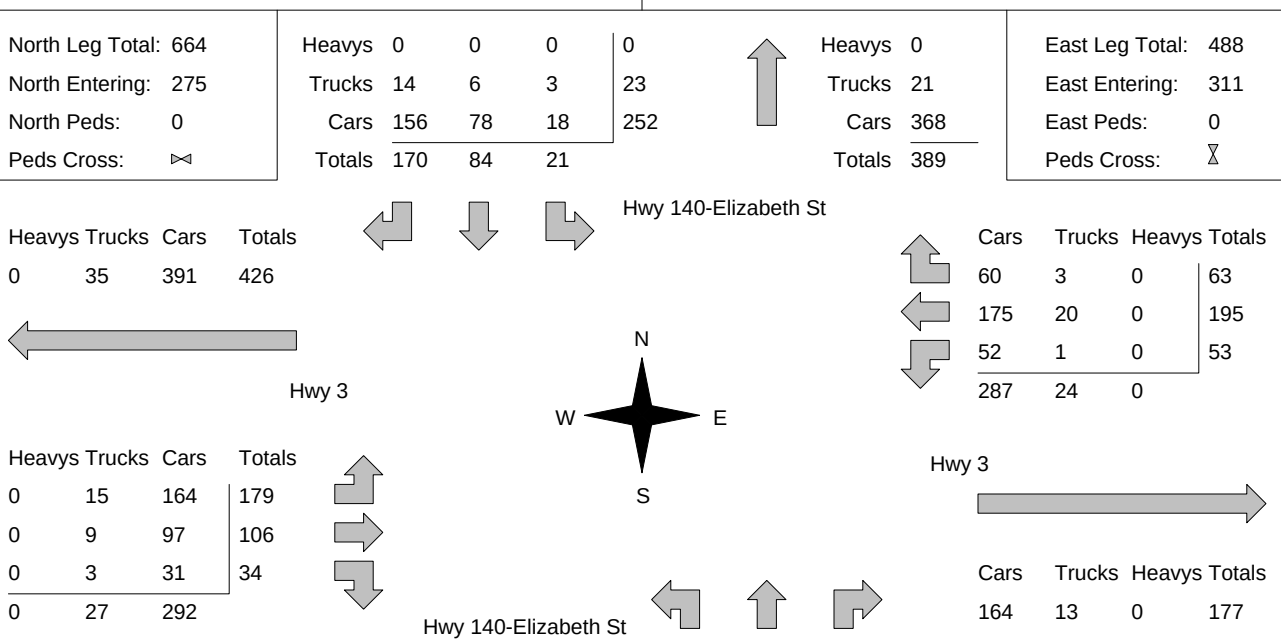
Municipality: Port Colborne
Site #: 1904000005
Intersection: Hwy 3 & Hwy 140-Elizabeth St
TFR File #: 1
Count date: 28-Feb-19

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Hwy 3 runs W/E



Comments

Ontario Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:00:00

One Hour Peak
From: 16:15:00
To: 17:15:00

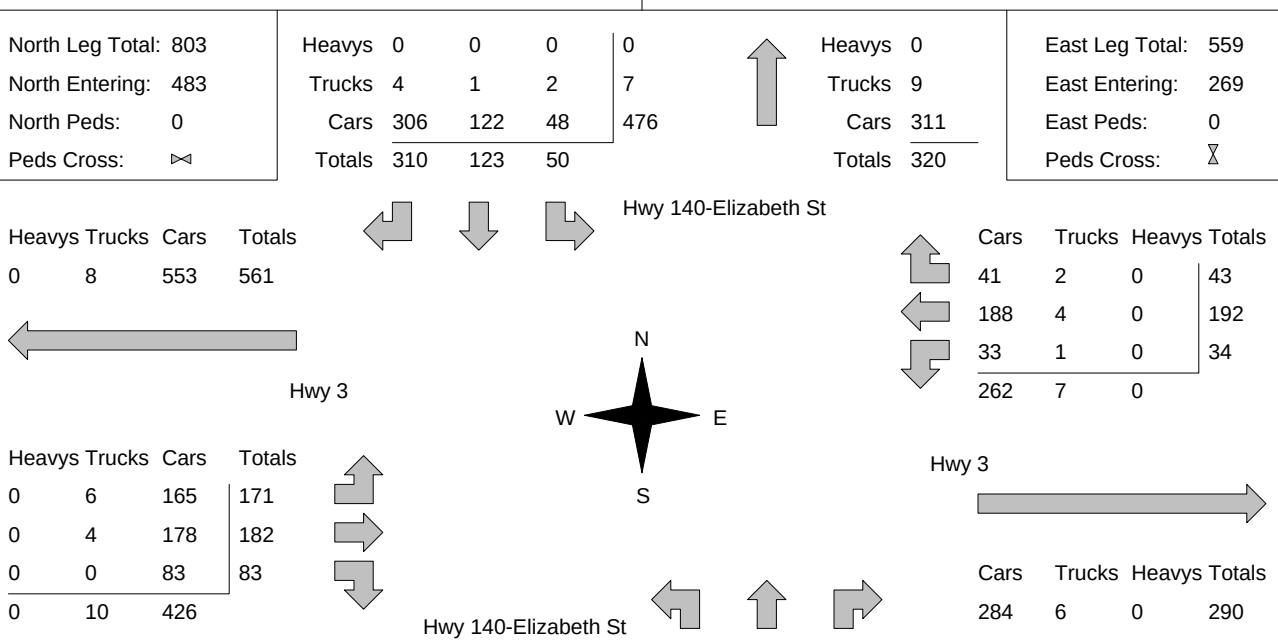
Municipality: Port Colborne
Site #: 1904000005
Intersection: Hwy 3 & Hwy 140-Elizabeth St
TFR File #: 1
Count date: 28-Feb-19

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Hwy 3 runs W/E



Comments

Ontario Traffic Inc.

Morning Peak Diagram

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

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

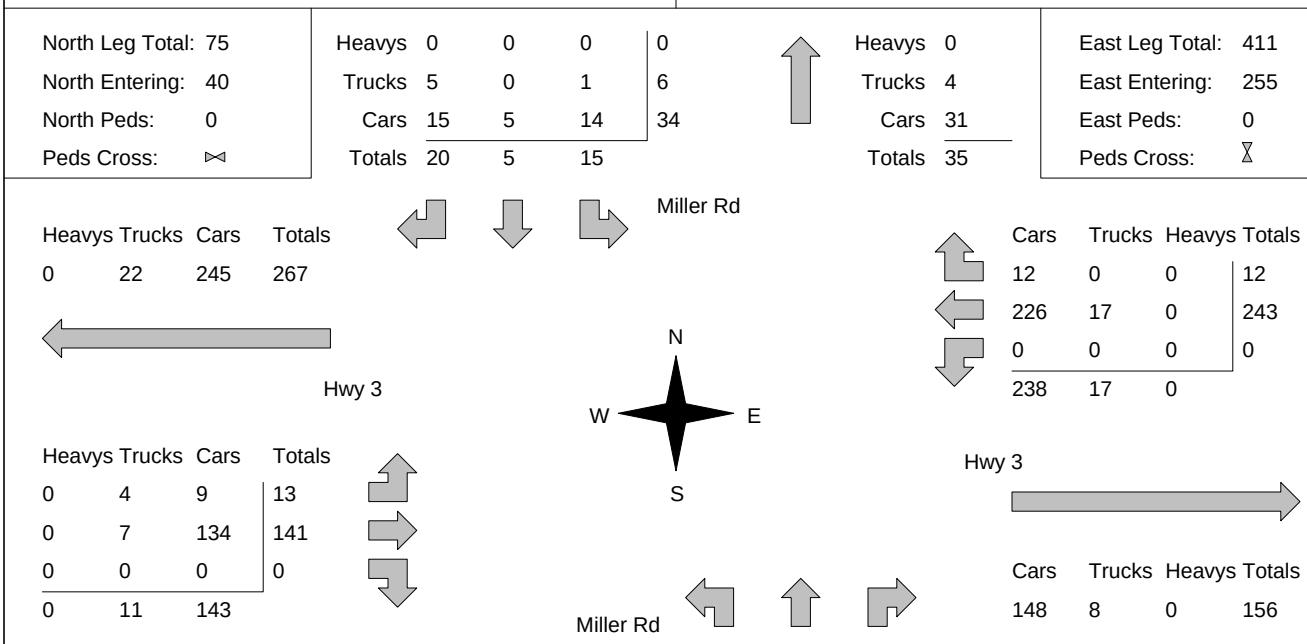
Municipality: Port Colborne
Site #: 1904000006
Intersection: Hwy 3 & Miller Rd
TFR File #: 1
Count date: 28-Feb-19

Weather conditions:

Person(s) who counted:

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

Major Road: Hwy 3 runs W/E



Comments

Ontario Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:00:00

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

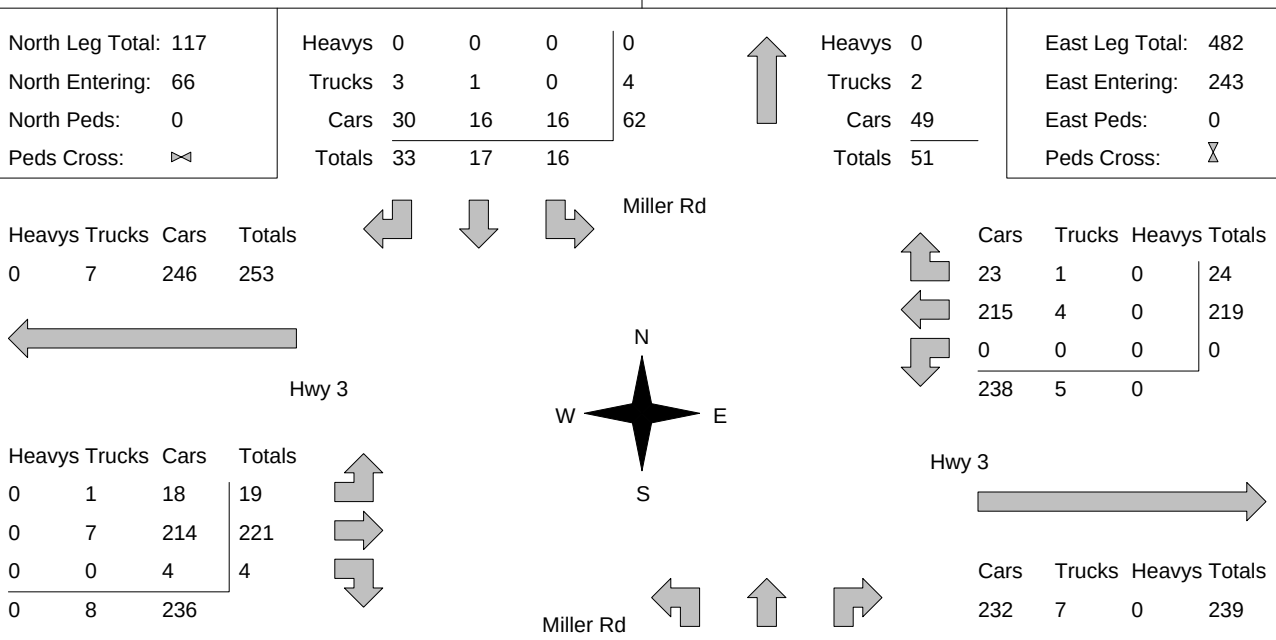
Municipality: Port Colborne
Site #: 1904000006
Intersection: Hwy 3 & Miller Rd
TFR File #: 1
Count date: 28-Feb-19

Weather conditions:

Person(s) who counted:

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

Major Road: Hwy 3 runs W/E



Comments

Appendix B – Intersection Control Warrants

OTM BOOK 12* - JUSTIFICATION 7

Project: Port Colborne Quarries Pit 3 Expansion **Date:** October 14, 2020

Project #: 115774

Location: Second Concession Road (*Major Roadway*) at Barber Road / Canal Road (*Minor Roadway*)

Orientation: East/West North/South

Municipality: City of Port Colborne **Scenario:** Future (2041) Total Traffic

WARRANT	DESCRIPTION	MINIMUM REQUIREMENT FOR 2 LANE HIGHWAYS				COMPLIANCE		
		FREE FLOW	RESTRICTED FLOW	ADJUSTED FREE FLOW	ADJUSTED RESTRICTED FLOW	SECTIONAL Number	SECTIONAL %	ENTIRE %
1. MINIMUM VEHICULAR VOLUME	A. Vehicle volumes, all approaches (Average Hour)	480	720	576	864	19	3%	3%
	B. Vehicle volume along minor roads (Average Hour)	120	170	144	204	11	8%	
2. DELAY TO CROSS TRAFFIC	A. Vehicle volumes, along artery (Average Hour)	480	720	576	864	8	1%	1%
	B. Combined vehicle and pedestrian volume crossing artery from minor roads (Average Hour)	50	75	60	90	4	7%	

Projected Traffic Volumes:

Average Hourly Volume (AHV) Equation: AHV = (amPHV + pmPHV)/4

AM Peak Hour Volumes

			↖	1	
0	1	4	←	2	
↙	↓	↘	↙	6	
	0	↗	↖	↑	↗
	1	→	2	1	14
	6	↘			

PM Peak Hour Volumes

			↖	1	
0	1	3	←	0	
↙	↓	↘	↙	13	
	0	↗	↖	↑	↗
	0	→	0	0	18
	0	↘			

Average Hourly Volumes (AHV)

			↖	1	
0	1	2	←	1	
↙	↓	↘	↙	5	
	0	↗	↖	↑	↗
	0	→	1	0	8
	2	↘			

Notes:

1. Vehicle volume warrant (1A) and (2A) for intersections of roadways having two or more moving lanes in one direction should be 25% higher than the values given above. — 1 Lane per Direction

2. Warrant values for free flow apply when the 85th percentile speed of artery traffic equals or exceeds 70 km/h or when the intersection lies within the built-up area of an isolated community having a population of less than 10,000. Warrant values for restricted flow apply to large urban communities when the 85th percentile speed of artery traffic does not exceed 70 km/h. — Free Flow

3. The lowest sectional percentage governs the entire warrant.

4. For "T" intersections the warrant values for the minor road should be increased by 50% (Warrant 1B only). — 4-legged Intersection

5. All flow values for Warrant 1 and Warrant 2 are to be increased by 20% for existing intersections and by 50% in the case of new intersections. — Existing Intersection

6. The crossing volumes are defined as the sum of:

(a) Left-turns from both minor road approaches. — 1, 2

(b) The heaviest through volume from the minor road. — 1

(c) 50% of the heavier left turn movement from major road when both of the following are met: — 5

(i) the left-turn volume >120 vph — No

(ii) the left-turn volume plus the opposing volume >720 vph — No

(d) Pedestrians crossing the main road. — 0

CONCLUSION: The intersection does NOT meet the minimum warrants for traffic control signals.

* "Ontario Traffic Manual, Book 12 (March 2012)", Ontario Ministry of Transportation.

OTM BOOK 12* - JUSTIFICATION 7

Project: Port Colborne Quarries Pit 3 Expansion **Date:** October 14, 2020

Project #: 115774

Location: Second Concession Road (*Major Roadway*) at Ramey Road (*Minor Roadway*)

Orientation: East/West North/South

Municipality: City of Port Colborne **Scenario:** Future (2041) Total Traffic

WARRANT	DESCRIPTION	MINIMUM REQUIREMENT FOR 2 LANE HIGHWAYS				COMPLIANCE		
		FREE FLOW	RESTRICTED FLOW	ADJUSTED FREE FLOW	ADJUSTED RESTRICTED FLOW	SECTIONAL Number	SECTIONAL %	ENTIRE %
1. MINIMUM VEHICULAR VOLUME	A. Vehicle volumes, all approaches (Average Hour)	480	720	576	864	65	11%	7%
	B. Vehicle volume along minor roads (Average Hour)	120	170	144	204	10	7%	
2. DELAY TO CROSS TRAFFIC	A. Vehicle volumes, along artery (Average Hour)	480	720	576	864	55	10%	10%
	B. Combined vehicle and pedestrian volume crossing artery from minor roads (Average Hour)	50	75	60	90	7	12%	

Projected Traffic Volumes:

Average Hourly Volume (AHV) Equation: AHV = (amPHV + pmPHV)/4

AM Peak Hour Volumes

			↖	2	
3	0	0	←	49	
↙	↓	↘	↙	0	
	1	↗	↖	↑	↗
	32	→	4	0	0
	11	↘			

PM Peak Hour Volumes

			↖	0	
3	0	0	←	59	
↙	↓	↘	↙	0	
	5	↗	↖	↑	↗
	55	→	22	0	4
	3	↘			

Average Hourly Volumes (AHV)

			↖	1	
2	0	0	←	27	
↙	↓	↘	↙	0	
	2	↗	↖	↑	↗
	22	→	7	0	1
	4	↘			

Notes:

1. Vehicle volume warrant (1A) and (2A) for intersections of roadways having two or more moving lanes in one direction should be 25% higher than the values given above. — 1 Lane per Direction

2. Warrant values for free flow apply when the 85th percentile speed of artery traffic equals or exceeds 70 km/h or when the intersection lies within the built-up area of an isolated community having a population of less than 10,000. Warrant values for restricted flow apply to large urban communities when the 85th percentile speed of artery traffic does not exceed 70 km/h. — Free Flow

3. The lowest sectional percentage governs the entire warrant.

4. For "T" intersections the warrant values for the minor road should be increased by 50% (Warrant 1B only). — 4-legged Intersection

5. All flow values for Warrant 1 and Warrant 2 are to be increased by 20% for existing intersections and by 50% in the case of new intersections. — Existing Intersection

6. The crossing volumes are defined as the sum of:

(a) Left-turns from both minor road approaches. — 7 / 0

(b) The heaviest through volume from the minor road. — 0

(c) 50% of the heavier left turn movement from major road when both of the following are met: — 2

(i) the left-turn volume >120 vph — No

(ii) the left-turn volume plus the opposing volume >720 vph — No

(d) Pedestrians crossing the main road. — 0

CONCLUSION: The intersection does NOT meet the minimum warrants for traffic control signals.

* "Ontario Traffic Manual, Book 12 (March 2012)", Ontario Ministry of Transportation.

OTM BOOK 12* - JUSTIFICATION 7

Project: Port Colborne Quarries Pit 3 Expansion **Date:** October 14, 2020

Project #: 115774

Location: Second Concession Road (*Major Roadway*) at Miller Road (*Minor Roadway*)

Orientation: North/South East/West

Municipality: City of Port Colborne **Scenario:** Future (2041) Total Traffic

WARRANT	DESCRIPTION	MINIMUM REQUIREMENT FOR 2 LANE HIGHWAYS				COMPLIANCE		
		FREE FLOW	RESTRICTED FLOW	ADJUSTED FREE FLOW	ADJUSTED RESTRICTED FLOW	SECTIONAL Number	SECTIONAL %	ENTIRE %
1. MINIMUM VEHICULAR VOLUME	A. Vehicle volumes, all approaches (Average Hour)	480	720	576	864	111	19%	19%
	B. Vehicle volume along minor roads (Average Hour)	120	170	144	204	36	25%	
2. DELAY TO CROSS TRAFFIC	A. Vehicle volumes, along artery (Average Hour)	480	720	576	864	75	13%	13%
	B. Combined vehicle and pedestrian volume crossing artery from minor roads (Average Hour)	50	75	60	90	19	32%	

Projected Traffic Volumes:

Average Hourly Volume (AHV) Equation: AHV = (amPHV + pmPHV)/4

AM Peak Hour Volumes

			↖	←	9
0	↓	29	↙	←	22
↙		↘	↙	↓	6
	3	↗	↖	↑	↗
	26	→	4	53	24
	0	↘			

PM Peak Hour Volumes

			↖	←	9
6	↓	9	↙	←	26
↙		↘	↙	↓	12
	9	↗	↖	↑	↗
	17	→	3	63	3
	4	↘			

Average Hourly Volumes (AHV)

			↖	←	4
1	↓	9	↙	←	12
↙		↘	↙	↓	4
	3	↗	↖	↑	↗
	11	→	2	29	7
	1	↘			

Notes:

1. Vehicle volume warrant (1A) and (2A) for intersections of roadways having two or more moving lanes in one direction should be 25% higher than the values given above. — 1 Lane per Direction

2. Warrant values for free flow apply when the 85th percentile speed of artery traffic equals or exceeds 70 km/h or when the intersection lies within the built-up area of an isolated community having a population of less than 10,000. Warrant values for restricted flow apply to large urban communities when the 85th percentile speed of artery traffic does not exceed 70 km/h. — Free Flow

3. The lowest sectional percentage governs the entire warrant.

4. For "T" intersections the warrant values for the minor road should be increased by 50% (Warrant 1B only). — 4-legged Intersection

5. All flow values for Warrant 1 and Warrant 2 are to be increased by 20% for existing intersections and by 50% in the case of new intersections. — Existing Intersection

6. The crossing volumes are defined as the sum of:

(a) Left-turns from both minor road approaches. — 4 / 3

(b) The heaviest through volume from the minor road. — 12

(c) 50% of the heavier left turn movement from major road when both of the following are met: — 9

(i) the left-turn volume >120 vph — No

(ii) the left-turn volume plus the opposing volume >720 vph — No

(d) Pedestrians crossing the main road. — 0

CONCLUSION: The intersection does NOT meet the minimum warrants for traffic control signals.

* "Ontario Traffic Manual, Book 12 (March 2012)", Ontario Ministry of Transportation.

OTM BOOK 12* - JUSTIFICATION 7

Project: Port Colborne Quarries Pit 3 Expansion **Date:** October 14, 2020

Project #: 115774

Location: Highway 3 (*Major Roadway*) at Miller Road (*Minor Roadway*)

Orientation: East/West North/South

Municipality: City of Port Colborne **Scenario:** Future (2041) Total Traffic

WARRANT	DESCRIPTION	MINIMUM REQUIREMENT FOR 2 LANE HIGHWAYS				COMPLIANCE		
		FREE FLOW	RESTRICTED FLOW	ADJUSTED FREE FLOW	ADJUSTED RESTRICTED FLOW	SECTIONAL Number	SECTIONAL %	ENTIRE %
1. MINIMUM VEHICULAR VOLUME	A. Vehicle volumes, all approaches (Average Hour)	480	720	576	864	333	58%	26%
	B. Vehicle volume along minor roads (Average Hour)	120	170	144	204	37	26%	
2. DELAY TO CROSS TRAFFIC	A. Vehicle volumes, along artery (Average Hour)	480	720	576	864	296	51%	33%
	B. Combined vehicle and pedestrian volume crossing artery from minor roads (Average Hour)	50	75	60	90	20	33%	

Projected Traffic Volumes:

Average Hourly Volume (AHV) Equation: AHV = (amPHV + pmPHV)/4

AM Peak Hour Volumes

			↖	17	
22	7	20	←	353	
↙	↓	↘	↙	0	
	19	↗	↖	↑	↗
	206	→	6	14	0
	0	↘			

PM Peak Hour Volumes

			↖	17	
29	7	22	←	350	
↙	↓	↘	↙	0	
	19	↗	↖	↑	↗
	203	→	6	14	0
	0	↘			

Average Hourly Volumes (AHV)

			↖	9	
13	4	10	←	176	
↙	↓	↘	↙	0	
	9	↗	↖	↑	↗
	102	→	3	7	0
	0	↘			

Notes:

1. Vehicle volume warrant (1A) and (2A) for intersections of roadways having two or more moving lanes in one direction should be 25% higher than the values given above. — 1 Lane per Direction

2. Warrant values for free flow apply when the 85th percentile speed of artery traffic equals or exceeds 70 km/h or when the intersection lies within the built-up area of an isolated community having a population of less than 10,000. Warrant values for restricted flow apply to large urban communities when the 85th percentile speed of artery traffic does not exceed 70 km/h. — Free Flow

3. The lowest sectional percentage governs the entire warrant.

4. For "T" intersections the warrant values for the minor road should be increased by 50% (Warrant 1B only). — 4-legged Intersection

5. All flow values for Warrant 1 and Warrant 2 are to be increased by 20% for existing intersections and by 50% in the case of new intersections. — Existing Intersection

6. The crossing volumes are defined as the sum of:

(a) Left-turns from both minor road approaches. — 3 / 10

(b) The heaviest through volume from the minor road. — 7

(c) 50% of the heavier left turn movement from major road when both of the following are met: — 9

(i) the left-turn volume >120 vph — No

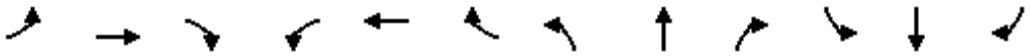
(ii) the left-turn volume plus the opposing volume >720 vph — No

(d) Pedestrians crossing the main road. — 0

CONCLUSION: The intersection does NOT meet the minimum warrants for traffic control signals.

* "Ontario Traffic Manual, Book 12 (March 2012)", Ontario Ministry of Transportation.

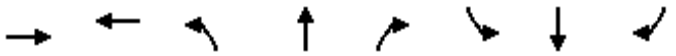
Appendix C – Intersection Capacity Analysis



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	1	6	6	2	1	2	1	14	4	1	0
Future Volume (vph)	0	1	6	6	2	1	2	1	14	4	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1	7	7	2	1	2	1	15	4	1	0

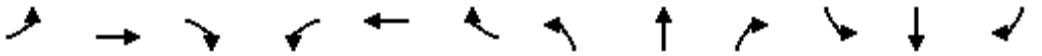
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	8	10	18	5
Volume Left (vph)	0	7	2	4
Volume Right (vph)	7	1	15	0
Hadj (s)	0.18	0.64	-0.29	1.86
Departure Headway (s)	4.1	4.6	3.7	5.8
Degree Utilization, x	0.01	0.01	0.02	0.01
Capacity (veh/h)	858	774	975	604
Control Delay (s)	7.2	7.7	6.7	8.9
Approach Delay (s)	7.2	7.7	6.7	8.9
Approach LOS	A	A	A	A

Intersection Summary				
Delay	7.3			
Level of Service	A			
Intersection Capacity Utilization	15.5%	ICU Level of Service	A	
Analysis Period (min)	15			



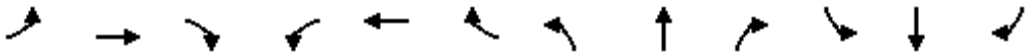
Lane Group	EBT	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	16	44	1	455	24	12	275	9
v/c Ratio	0.03	0.08	0.00	0.31	0.02	0.02	0.19	0.01
Control Delay	11.8	10.4	6.0	5.6	2.0	5.5	4.9	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.8	10.4	6.0	5.6	2.0	5.5	4.9	0.4
Queue Length 50th (m)	0.2	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Queue Length 95th (m)	4.3	7.8	0.5	39.4	1.8	2.2	22.5	0.3
Internal Link Dist (m)	330.5	47.0		782.7			84.7	
Turn Bay Length (m)			113.0		180.0	50.0		15.0
Base Capacity (vph)	1224	1222	1127	1837	1321	754	1802	1176
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	0.01	0.04	0.00	0.25	0.02	0.02	0.15	0.01

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	1	3	25	3	13	1	419	22	11	253	8
Future Volume (vph)	11	1	3	25	3	13	1	419	22	11	253	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.97			0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96			0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1427			1432		1825	1847	1328	1437	1812	1183
Flt Permitted		1.00			1.00		0.59	1.00	1.00	0.50	1.00	1.00
Satd. Flow (perm)		1481			1476		1134	1847	1328	757	1812	1183
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	1	3	27	3	14	1	455	24	12	275	9
RTOR Reduction (vph)	0	3	0	0	13	0	0	0	11	0	0	4
Lane Group Flow (vph)	0	13	0	0	31	0	1	455	13	12	275	5
Heavy Vehicles (%)	27%	0%	33%	24%	0%	31%	0%	4%	23%	27%	6%	38%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		2.8			2.8		18.8	18.8	18.8	18.8	18.8	18.8
Effective Green, g (s)		2.8			2.8		18.8	18.8	18.8	18.8	18.8	18.8
Actuated g/C Ratio		0.08			0.08		0.54	0.54	0.54	0.54	0.54	0.54
Clearance Time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Grp Cap (vph)		119			119		616	1003	721	411	984	642
v/s Ratio Prot								c0.25			0.15	
v/s Ratio Perm		0.01			c0.02		0.00		0.01	0.02		0.00
v/c Ratio		0.11			0.26		0.00	0.45	0.02	0.03	0.28	0.01
Uniform Delay, d1		14.7			14.9		3.6	4.8	3.6	3.7	4.3	3.6
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.4			1.2		0.0	0.6	0.0	0.1	0.3	0.0
Delay (s)		15.2			16.1		3.6	5.4	3.7	3.7	4.5	3.6
Level of Service		B			B		A	A	A	A	A	A
Approach Delay (s)		15.2			16.1			5.3			4.5	
Approach LOS		B			B			A			A	

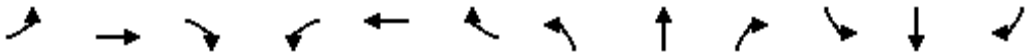
Intersection Summary			
HCM 2000 Control Delay	5.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	34.6	Sum of lost time (s)	13.0
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	22	11	0	34	2	4	0	0	0	0	3
Future Volume (Veh/h)	1	22	11	0	34	2	4	0	0	0	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	24	12	0	37	2	4	0	0	0	0	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		71										
pX, platoon unblocked												
vC, conflicting volume	39			36			73	71	30	70	76	38
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	39			36			73	71	30	70	76	38
tC, single (s)	4.1			4.1			8.1	6.5	6.2	7.1	6.5	6.5
tC, 2 stage (s)												
tF (s)	2.2			2.2			4.4	4.0	3.3	3.5	4.0	3.6
p0 queue free %	100			100			99	100	100	100	100	100
cM capacity (veh/h)	1584			1588			723	823	1050	926	818	952

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	37	39	4	3
Volume Left	1	0	4	0
Volume Right	12	2	0	3
cSH	1584	1588	723	952
Volume to Capacity	0.00	0.00	0.01	0.00
Queue Length 95th (m)	0.0	0.0	0.1	0.1
Control Delay (s)	0.2	0.0	10.0	8.8
Lane LOS	A		B	A
Approach Delay (s)	0.2	0.0	10.0	8.8
Approach LOS			B	A

Intersection Summary				
Average Delay	0.9			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A	
Analysis Period (min)	15			



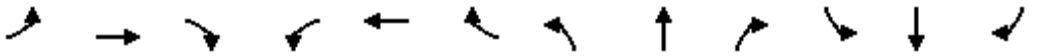
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	18	0	4	15	6	3	37	17	20	27	0
Future Volume (Veh/h)	2	18	0	4	15	6	3	37	17	20	27	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	20	0	4	16	7	3	40	18	22	29	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)												
pX, platoon unblocked												
vC, conflicting volume	143	137	29	138	128	49	29			58		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	143	137	29	138	128	49	29			58		
tC, single (s)	7.1	6.6	6.2	7.8	6.7	6.2	4.4			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	4.2	4.2	3.3	2.5			2.2		
p0 queue free %	100	97	100	99	98	99	100			99		
cM capacity (veh/h)	801	734	1052	668	718	1025	1405			1527		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	22	27	61	51
Volume Left	2	4	3	22
Volume Right	0	7	18	0
cSH	740	769	1405	1527
Volume to Capacity	0.03	0.04	0.00	0.01
Queue Length 95th (m)	0.7	0.8	0.0	0.3
Control Delay (s)	10.0	9.8	0.4	3.3
Lane LOS	B	A	A	A
Approach Delay (s)	10.0	9.8	0.4	3.3
Approach LOS	B	A		

Intersection Summary				
Average Delay	4.2			
Intersection Capacity Utilization	19.2%	ICU Level of Service	A	
Analysis Period (min)	15			

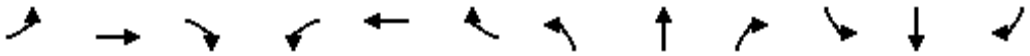
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	195	115	34	58	212	68	66	214	23	91	185
v/c Ratio	0.46	0.17	0.06	0.12	0.32	0.11	0.19	0.44	0.08	0.20	0.35
Control Delay	14.4	9.8	1.9	9.6	11.1	3.5	14.9	15.6	14.0	14.4	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.4	9.8	1.9	9.6	11.1	3.5	14.9	15.6	14.0	14.4	5.1
Queue Length 50th (m)	9.7	5.0	0.0	2.5	9.8	0.0	3.6	11.0	1.2	4.9	0.0
Queue Length 95th (m)	26.0	14.0	2.2	8.5	24.1	5.2	12.1	29.1	5.8	15.0	11.0
Internal Link Dist (m)		197.3			831.7			297.4		206.2	
Turn Bay Length (m)	160.0		120.0	150.0		115.0	110.0		145.0		85.0
Base Capacity (vph)	903	1446	1217	1045	1419	1277	916	1270	733	1251	1109
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	0.22	0.08	0.03	0.06	0.15	0.05	0.07	0.17	0.03	0.07	0.17

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	179	106	31	53	195	63	61	147	50	21	84	170
Future Volume (vph)	179	106	31	53	195	63	61	147	50	21	84	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
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)	1690	1779	1484	1789	1746	1555	1789	1812		1601	1795	1512
Flt Permitted	0.63	1.00	1.00	0.68	1.00	1.00	0.70	1.00		0.62	1.00	1.00
Satd. Flow (perm)	1112	1779	1484	1286	1746	1555	1315	1812		1052	1795	1512
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	195	115	34	58	212	68	66	160	54	23	91	185
RTOR Reduction (vph)	0	0	21	0	0	42	0	18	0	0	0	137
Lane Group Flow (vph)	195	115	13	58	212	26	66	196	0	23	91	48
Heavy Vehicles (%)	8%	8%	10%	2%	10%	5%	2%	2%	2%	14%	7%	8%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	16.8	16.8	16.8	16.8	16.8	16.8	11.3	11.3		11.3	11.3	11.3
Effective Green, g (s)	16.8	16.8	16.8	16.8	16.8	16.8	11.3	11.3		11.3	11.3	11.3
Actuated g/C Ratio	0.39	0.39	0.39	0.39	0.39	0.39	0.26	0.26		0.26	0.26	0.26
Clearance Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	430	688	574	497	675	601	342	471		273	467	393
v/s Ratio Prot		0.06			0.12			c0.11			0.05	
v/s Ratio Perm	c0.18		0.01	0.05		0.02	0.05			0.02		0.03
v/c Ratio	0.45	0.17	0.02	0.12	0.31	0.04	0.19	0.42		0.08	0.19	0.12
Uniform Delay, d1	9.9	8.7	8.2	8.5	9.3	8.3	12.5	13.3		12.1	12.5	12.3
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	1.3	0.2	0.0	0.2	0.5	0.1	0.3	0.6		0.1	0.2	0.1
Delay (s)	11.2	8.9	8.3	8.7	9.7	8.3	12.8	13.9		12.3	12.7	12.4
Level of Service	B	A	A	A	A	A	B	B		B	B	B
Approach Delay (s)		10.1			9.3			13.6			12.5	
Approach LOS		B			A			B			B	

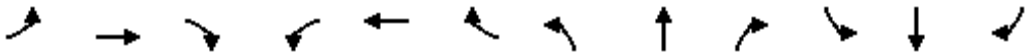
Intersection Summary			
HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	43.4	Sum of lost time (s)	15.3
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	141	0	0	243	12	4	10	0	15	5	20
Future Volume (Veh/h)	13	141	0	0	243	12	4	10	0	15	5	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	153	0	0	264	13	4	11	0	16	5	22
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	277			153			470	458	153	450	445	264
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	277			153			470	458	153	450	445	264
tC, single (s)	4.4			4.1			7.1	6.5	6.2	7.2	6.5	6.5
tC, 2 stage (s)												
tF (s)	2.5			2.2			3.5	4.0	3.3	3.6	4.0	3.5
p0 queue free %	99			100			99	98	100	97	99	97
cM capacity (veh/h)	1136			1440			484	496	898	497	505	722

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	167	0	264	13	15	43
Volume Left	14	0	0	0	4	16
Volume Right	0	0	0	13	0	22
cSH	1136	1700	1440	1700	493	593
Volume to Capacity	0.01	0.00	0.00	0.01	0.03	0.07
Queue Length 95th (m)	0.3	0.0	0.0	0.0	0.7	1.8
Control Delay (s)	0.8	0.0	0.0	0.0	12.5	11.5
Lane LOS	A				B	B
Approach Delay (s)	0.8		0.0		12.5	11.5
Approach LOS					B	B

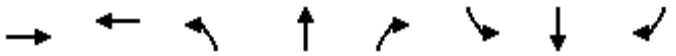
Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	28.3%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	0	0	13	0	1	0	0	18	3	1	0
Future Volume (vph)	0	0	0	13	0	1	0	0	18	3	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	14	0	1	0	0	20	3	1	0

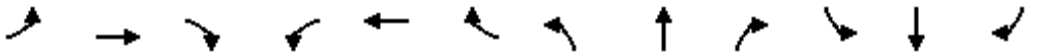
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	0	15	20	4
Volume Left (vph)	0	14	0	3
Volume Right (vph)	0	1	20	0
Hadj (s)	0.00	0.15	-0.60	0.15
Departure Headway (s)	4.0	4.1	3.3	4.1
Degree Utilization, x	0.00	0.02	0.02	0.00
Capacity (veh/h)	900	870	1070	869
Control Delay (s)	7.0	7.2	6.4	7.1
Approach Delay (s)	0.0	7.2	6.4	7.1
Approach LOS	A	A	A	A

Intersection Summary				
Delay	6.8			
Level of Service	A			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A	
Analysis Period (min)	15			



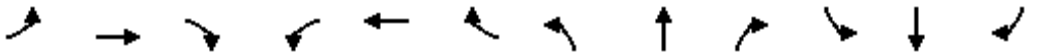
Lane Group	EBT	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	20	58	2	328	39	7	525	10
v/c Ratio	0.03	0.09	0.00	0.22	0.03	0.01	0.34	0.01
Control Delay	13.1	11.3	5.5	4.8	2.6	5.2	5.6	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.1	11.3	5.5	4.8	2.6	5.2	5.6	0.4
Queue Length 50th (m)	0.4	0.9	0.0	0.0	0.0	0.0	0.0	0.0
Queue Length 95th (m)	5.3	10.1	0.7	26.3	2.9	1.5	45.9	0.4
Internal Link Dist (m)	330.5	47.0		782.7			84.7	
Turn Bay Length (m)			113.0		180.0	50.0		15.0
Base Capacity (vph)	1559	1469	592	1855	1519	909	1874	1450
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	0.01	0.04	0.00	0.18	0.03	0.01	0.28	0.01

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	2	1	37	5	12	2	302	36	6	483	9
Future Volume (vph)	16	2	1	37	5	12	2	302	36	6	483	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.99			0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96			0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1830			1735		1217	1883	1541	1560	1902	1471
Flt Permitted		1.00			1.00		0.47	1.00	1.00	0.56	1.00	1.00
Satd. Flow (perm)		1908			1795		601	1883	1541	924	1902	1471
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	2	1	40	5	13	2	328	39	7	525	10
RTOR Reduction (vph)	0	1	0	0	12	0	0	0	17	0	0	4
Lane Group Flow (vph)	0	19	0	0	46	0	2	328	22	7	525	6
Heavy Vehicles (%)	0%	0%	0%	0%	0%	17%	50%	2%	6%	17%	1%	11%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		2.8			2.8		19.9	19.9	19.9	19.9	19.9	19.9
Effective Green, g (s)		2.8			2.8		19.9	19.9	19.9	19.9	19.9	19.9
Actuated g/C Ratio		0.08			0.08		0.56	0.56	0.56	0.56	0.56	0.56
Clearance Time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Grp Cap (vph)		149			140		335	1049	858	515	1060	819
v/s Ratio Prot								0.17			c0.28	
v/s Ratio Perm		0.01			c0.03		0.00		0.01	0.01		0.00
v/c Ratio		0.13			0.33		0.01	0.31	0.03	0.01	0.50	0.01
Uniform Delay, d1		15.3			15.6		3.5	4.2	3.5	3.5	4.8	3.5
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.4			1.4		0.0	0.3	0.0	0.0	0.6	0.0
Delay (s)		15.7			16.9		3.5	4.5	3.6	3.5	5.5	3.5
Level of Service		B			B		A	A	A	A	A	A
Approach Delay (s)		15.7			16.9			4.4			5.4	
Approach LOS		B			B			A			A	

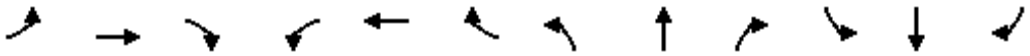
Intersection Summary			
HCM 2000 Control Delay	5.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	35.7	Sum of lost time (s)	13.0
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	38	3	0	41	0	22	0	4	0	0	3
Future Volume (Veh/h)	5	38	3	0	41	0	22	0	4	0	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	41	3	0	45	0	24	0	4	0	0	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		71										
pX, platoon unblocked												
vC, conflicting volume	45			44			100	98	42	102	99	45
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	45			44			100	98	42	102	99	45
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			97	100	100	100	100	100
cM capacity (veh/h)	1576			1577			848	794	1034	879	792	1031

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	49	45	28	3
Volume Left	5	0	24	0
Volume Right	3	0	4	3
cSH	1576	1577	871	1031
Volume to Capacity	0.00	0.00	0.03	0.00
Queue Length 95th (m)	0.1	0.0	0.8	0.1
Control Delay (s)	0.8	0.0	9.3	8.5
Lane LOS	A		A	A
Approach Delay (s)	0.8	0.0	9.3	8.5
Approach LOS			A	A

Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	21.2%	ICU Level of Service	A	
Analysis Period (min)	15			



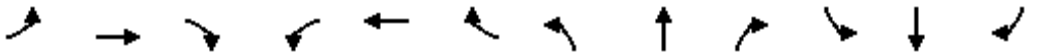
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	12	3	8	18	6	2	44	2	6	46	4
Future Volume (Veh/h)	6	12	3	8	18	6	2	44	2	6	46	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	13	3	9	20	7	2	48	2	7	50	4
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	136	120	52	128	121	49	54			50		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	136	120	52	128	121	49	54			50		
tC, single (s)	7.1	6.6	6.2	7.2	6.5	6.4	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.6	4.0	3.5	2.2			2.2		
p0 queue free %	99	98	100	99	97	99	100			100		
cM capacity (veh/h)	814	755	1021	805	769	979	1564			1570		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	23	36	52	61
Volume Left	7	9	2	7
Volume Right	3	7	2	4
cSH	800	812	1564	1570
Volume to Capacity	0.03	0.04	0.00	0.00
Queue Length 95th (m)	0.7	1.1	0.0	0.1
Control Delay (s)	9.6	9.6	0.3	0.9
Lane LOS	A	A	A	A
Approach Delay (s)	9.6	9.6	0.3	0.9
Approach LOS	A	A		

Intersection Summary				
Average Delay	3.7			
Intersection Capacity Utilization	15.1%	ICU Level of Service	A	
Analysis Period (min)	15			

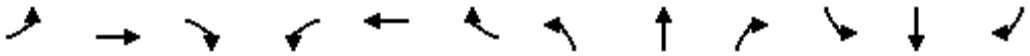
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	186	198	90	37	209	47	64	178	54	134	337
v/c Ratio	0.41	0.27	0.13	0.08	0.29	0.07	0.20	0.37	0.18	0.28	0.51
Control Delay	13.1	10.2	3.1	8.9	10.3	2.8	15.2	13.6	15.1	15.4	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.1	10.2	3.1	8.9	10.3	2.8	15.2	13.6	15.1	15.4	5.4
Queue Length 50th (m)	9.1	9.0	0.0	1.6	9.6	0.0	3.5	7.7	2.9	7.4	0.0
Queue Length 95th (m)	23.2	21.2	5.7	5.8	22.3	3.4	12.0	22.8	10.7	20.6	14.7
Internal Link Dist (m)		197.3			831.7			297.4		206.2	
Turn Bay Length (m)	160.0		120.0	150.0		115.0	110.0		145.0		85.0
Base Capacity (vph)	952	1549	1359	971	1549	1290	908	1286	839	1341	1239
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	0.20	0.13	0.07	0.04	0.13	0.04	0.07	0.14	0.06	0.10	0.27

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	171	182	83	34	192	43	59	106	58	50	123	310
Future Volume (vph)	171	182	83	34	192	43	59	106	58	50	123	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
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)	1755	1883	1633	1772	1883	1555	1825	1807		1755	1902	1617
Flt Permitted	0.63	1.00	1.00	0.63	1.00	1.00	0.67	1.00		0.64	1.00	1.00
Satd. Flow (perm)	1158	1883	1633	1181	1883	1555	1290	1807		1191	1902	1617
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	186	198	90	37	209	47	64	115	63	54	134	337
RTOR Reduction (vph)	0	0	55	0	0	29	0	29	0	0	0	252
Lane Group Flow (vph)	186	198	35	37	209	18	64	149	0	54	134	85
Heavy Vehicles (%)	4%	2%	0%	3%	2%	5%	0%	1%	0%	4%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	16.7	16.7	16.7	16.7	16.7	16.7	10.8	10.8		10.8	10.8	10.8
Effective Green, g (s)	16.7	16.7	16.7	16.7	16.7	16.7	10.8	10.8		10.8	10.8	10.8
Actuated g/C Ratio	0.39	0.39	0.39	0.39	0.39	0.39	0.25	0.25		0.25	0.25	0.25
Clearance Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	451	734	637	460	734	606	325	455		300	479	408
v/s Ratio Prot		0.11			0.11			c0.08			0.07	
v/s Ratio Perm	c0.16		0.02	0.03		0.01	0.05			0.05		0.05
v/c Ratio	0.41	0.27	0.06	0.08	0.28	0.03	0.20	0.33		0.18	0.28	0.21
Uniform Delay, d1	9.5	8.9	8.1	8.2	9.0	8.1	12.6	13.0		12.5	12.9	12.6
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	1.1	0.3	0.1	0.1	0.4	0.0	0.3	0.4		0.3	0.3	0.3
Delay (s)	10.5	9.2	8.2	8.3	9.3	8.1	12.9	13.5		12.8	13.2	12.9
Level of Service	B	A	A	A	A	A	B	B		B	B	B
Approach Delay (s)		9.6			9.0			13.3			13.0	
Approach LOS		A			A			B			B	

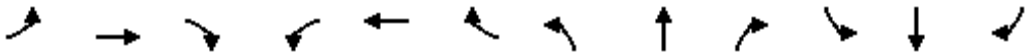
Intersection Summary			
HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	42.8	Sum of lost time (s)	15.3
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	221	4	0	219	24	1	8	2	16	17	33
Future Volume (Veh/h)	19	221	4	0	219	24	1	8	2	16	17	33
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	240	4	0	238	26	1	9	2	17	18	36
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	264			244			565	546	240	526	524	238
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	264			244			565	546	240	526	524	238
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.1	3.4
p0 queue free %	98			100			100	98	100	96	96	95
cM capacity (veh/h)	1283			1334			401	441	804	451	445	784

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	261	4	238	26	12	71
Volume Left	21	0	0	0	1	17
Volume Right	0	4	0	26	2	36
cSH	1283	1700	1334	1700	472	572
Volume to Capacity	0.02	0.00	0.00	0.02	0.03	0.12
Queue Length 95th (m)	0.4	0.0	0.0	0.0	0.6	3.2
Control Delay (s)	0.8	0.0	0.0	0.0	12.8	12.2
Lane LOS	A				B	B
Approach Delay (s)	0.8		0.0		12.8	12.2
Approach LOS					B	B

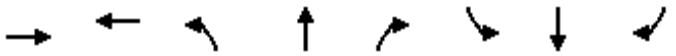
Intersection Summary				
Average Delay	2.0			
Intersection Capacity Utilization	41.6%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	1	6	6	2	1	2	1	14	4	1	0
Future Volume (vph)	0	1	6	6	2	1	2	1	14	4	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1	7	7	2	1	2	1	15	4	1	0

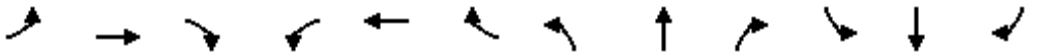
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	8	10	18	5
Volume Left (vph)	0	7	2	4
Volume Right (vph)	7	1	15	0
Hadj (s)	0.18	0.64	-0.29	1.86
Departure Headway (s)	4.1	4.6	3.7	5.8
Degree Utilization, x	0.01	0.01	0.02	0.01
Capacity (veh/h)	858	774	975	604
Control Delay (s)	7.2	7.7	6.7	8.9
Approach Delay (s)	7.2	7.7	6.7	8.9
Approach LOS	A	A	A	A

Intersection Summary				
Delay	7.3			
Level of Service	A			
Intersection Capacity Utilization	15.5%	ICU Level of Service	A	
Analysis Period (min)	15			



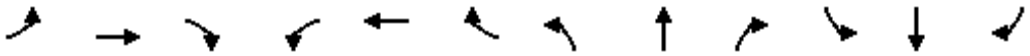
Lane Group	EBT	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	16	54	1	565	29	15	341	9
v/c Ratio	0.03	0.11	0.00	0.38	0.03	0.03	0.23	0.01
Control Delay	14.1	12.2	5.0	5.6	2.0	5.0	4.6	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.1	12.2	5.0	5.6	2.0	5.0	4.6	0.1
Queue Length 50th (m)	0.3	0.9	0.0	0.0	0.0	0.0	0.0	0.0
Queue Length 95th (m)	4.8	10.2	0.5	51.5	2.0	2.5	27.6	0.2
Internal Link Dist (m)	330.5	47.0		782.7			84.7	
Turn Bay Length (m)			113.0		180.0	50.0		15.0
Base Capacity (vph)	1164	1160	1029	1779	1280	651	1745	1141
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	0.01	0.05	0.00	0.32	0.02	0.02	0.20	0.01

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	1	3	31	3	16	1	520	27	14	314	8
Future Volume (vph)	11	1	3	31	3	16	1	520	27	14	314	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.97			0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96			0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1427			1428		1825	1847	1328	1437	1812	1183
Flt Permitted		1.00			1.00		0.56	1.00	1.00	0.45	1.00	1.00
Satd. Flow (perm)		1481			1473		1068	1847	1328	677	1812	1183
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	1	3	34	3	17	1	565	29	15	341	9
RTOR Reduction (vph)	0	3	0	0	16	0	0	0	12	0	0	4
Lane Group Flow (vph)	0	13	0	0	38	0	1	565	17	15	341	5
Heavy Vehicles (%)	27%	0%	33%	24%	0%	31%	0%	4%	23%	27%	6%	38%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		2.8			2.8		21.7	21.7	21.7	21.7	21.7	21.7
Effective Green, g (s)		2.8			2.8		21.7	21.7	21.7	21.7	21.7	21.7
Actuated g/C Ratio		0.07			0.07		0.58	0.58	0.58	0.58	0.58	0.58
Clearance Time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Grp Cap (vph)		110			109		618	1068	768	391	1048	684
v/s Ratio Prot								c0.31			0.19	
v/s Ratio Perm		0.01			c0.03		0.00		0.01	0.02		0.00
v/c Ratio		0.12			0.35		0.00	0.53	0.02	0.04	0.33	0.01
Uniform Delay, d1		16.2			16.5		3.3	4.8	3.4	3.4	4.1	3.3
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.5			2.0		0.0	0.8	0.0	0.1	0.3	0.0
Delay (s)		16.7			18.4		3.3	5.6	3.4	3.5	4.4	3.4
Level of Service		B			B		A	A	A	A	A	A
Approach Delay (s)		16.7			18.4			5.4			4.4	
Approach LOS		B			B			A			A	

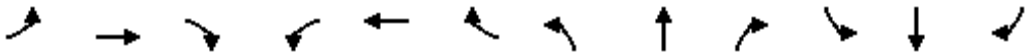
Intersection Summary			
HCM 2000 Control Delay	5.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	37.5	Sum of lost time (s)	13.0
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	27	11	0	42	2	4	0	0	0	0	3
Future Volume (Veh/h)	1	27	11	0	42	2	4	0	0	0	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	29	12	0	46	2	4	0	0	0	0	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		71										
pX, platoon unblocked												
vC, conflicting volume	48			41			87	85	35	84	90	47
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	48			41			87	85	35	84	90	47
tC, single (s)	4.1			4.1			8.1	6.5	6.2	7.1	6.5	6.5
tC, 2 stage (s)												
tF (s)	2.2			2.2			4.4	4.0	3.3	3.5	4.0	3.6
p0 queue free %	100			100			99	100	100	100	100	100
cM capacity (veh/h)	1572			1581			707	808	1044	907	803	941

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	42	48	4	3
Volume Left	1	0	4	0
Volume Right	12	2	0	3
cSH	1572	1581	707	941
Volume to Capacity	0.00	0.00	0.01	0.00
Queue Length 95th (m)	0.0	0.0	0.1	0.1
Control Delay (s)	0.2	0.0	10.1	8.8
Lane LOS	A		B	A
Approach Delay (s)	0.2	0.0	10.1	8.8
Approach LOS			B	A

Intersection Summary				
Average Delay	0.8			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	22	0	5	19	7	4	46	21	25	33	0
Future Volume (Veh/h)	2	22	0	5	19	7	4	46	21	25	33	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	24	0	5	21	8	4	50	23	27	36	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)												
pX, platoon unblocked												
vC, conflicting volume	178	171	36	172	160	62	36			73		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	178	171	36	172	160	62	36			73		
tC, single (s)	7.1	6.6	6.2	7.8	6.7	6.2	4.4			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	4.2	4.2	3.3	2.5			2.2		
p0 queue free %	100	97	100	99	97	99	100			98		
cM capacity (veh/h)	752	700	1042	627	687	1009	1397			1508		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	26	34	77	63
Volume Left	2	5	4	27
Volume Right	0	8	23	0
cSH	704	731	1397	1508
Volume to Capacity	0.04	0.05	0.00	0.02
Queue Length 95th (m)	0.9	1.1	0.1	0.4
Control Delay (s)	10.3	10.2	0.4	3.3
Lane LOS	B	B	A	A
Approach Delay (s)	10.3	10.2	0.4	3.3
Approach LOS	B	B		

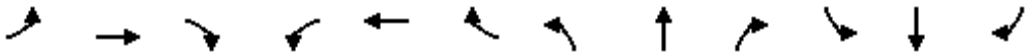
Intersection Summary				
Average Delay	4.3			
Intersection Capacity Utilization	19.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	241	142	41	72	263	85	83	265	28	113	229
v/c Ratio	0.56	0.20	0.06	0.14	0.38	0.13	0.24	0.52	0.10	0.23	0.40
Control Delay	17.7	10.6	2.4	10.5	12.3	3.4	17.0	18.6	15.9	16.3	5.2
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	17.7	10.6	2.4	10.5	12.3	3.4	17.0	18.6	15.9	16.3	5.2
Queue Length 50th (m)	13.9	6.9	0.0	3.4	13.8	0.0	5.0	15.6	1.6	6.8	0.0
Queue Length 95th (m)	38.3	19.0	3.0	11.4	34.3	6.1	17.1	42.7	7.7	21.0	13.3
Internal Link Dist (m)		197.3			831.7			297.4		206.2	
Turn Bay Length (m)	160.0		120.0	150.0		115.0	110.0		145.0		85.0
Base Capacity (vph)	795	1332	1125	939	1307	1185	826	1171	644	1152	1052
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	0.30	0.11	0.04	0.08	0.20	0.07	0.10	0.23	0.04	0.10	0.22

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	222	131	38	66	242	78	76	182	62	26	104	211
Future Volume (vph)	222	131	38	66	242	78	76	182	62	26	104	211
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
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)	1690	1779	1484	1789	1746	1555	1789	1812		1601	1795	1512
Flt Permitted	0.60	1.00	1.00	0.67	1.00	1.00	0.68	1.00		0.60	1.00	1.00
Satd. Flow (perm)	1062	1779	1484	1255	1746	1555	1289	1812		1004	1795	1512
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	241	142	41	72	263	85	83	198	67	28	113	229
RTOR Reduction (vph)	0	0	24	0	0	50	0	17	0	0	0	166
Lane Group Flow (vph)	241	142	17	72	263	35	83	248	0	28	113	63
Heavy Vehicles (%)	8%	8%	10%	2%	10%	5%	2%	2%	2%	14%	7%	8%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	19.5	19.5	19.5	19.5	19.5	19.5	13.1	13.1		13.1	13.1	13.1
Effective Green, g (s)	19.5	19.5	19.5	19.5	19.5	19.5	13.1	13.1		13.1	13.1	13.1
Actuated g/C Ratio	0.41	0.41	0.41	0.41	0.41	0.41	0.27	0.27		0.27	0.27	0.27
Clearance Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	432	724	604	510	710	633	352	495		274	490	413
v/s Ratio Prot		0.08			0.15			c0.14			0.06	
v/s Ratio Perm	c0.23		0.01	0.06		0.02	0.06			0.03		0.04
v/c Ratio	0.56	0.20	0.03	0.14	0.37	0.05	0.24	0.50		0.10	0.23	0.15
Uniform Delay, d1	10.9	9.1	8.5	8.9	9.9	8.6	13.5	14.6		13.0	13.5	13.2
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	2.3	0.2	0.0	0.2	0.6	0.1	0.3	0.8		0.2	0.2	0.2
Delay (s)	13.2	9.4	8.5	9.2	10.5	8.7	13.9	15.4		13.2	13.7	13.4
Level of Service	B	A	A	A	B	A	B	B		B	B	B
Approach Delay (s)		11.5			9.9			15.1			13.5	
Approach LOS		B			A			B			B	

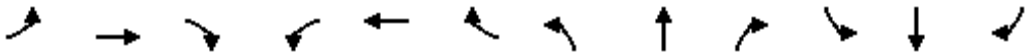
Intersection Summary			
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	47.9	Sum of lost time (s)	15.3
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	175	0	0	301	15	5	12	0	19	6	25
Future Volume (Veh/h)	16	175	0	0	301	15	5	12	0	19	6	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	190	0	0	327	16	5	13	0	21	7	27
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	343			190			582	567	190	558	551	327
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	343			190			582	567	190	558	551	327
tC, single (s)	4.4			4.1			7.1	6.5	6.2	7.2	6.5	6.5
tC, 2 stage (s)												
tF (s)	2.5			2.2			3.5	4.0	3.3	3.6	4.0	3.5
p0 queue free %	98			100			99	97	100	95	98	96
cM capacity (veh/h)	1071			1396			400	429	857	418	438	664

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	207	0	327	16	18	55
Volume Left	17	0	0	0	5	21
Volume Right	0	0	0	16	0	27
cSH	1071	1700	1396	1700	421	515
Volume to Capacity	0.02	0.00	0.00	0.01	0.04	0.11
Queue Length 95th (m)	0.4	0.0	0.0	0.0	1.0	2.7
Control Delay (s)	0.8	0.0	0.0	0.0	13.9	12.8
Lane LOS	A				B	B
Approach Delay (s)	0.8		0.0		13.9	12.8
Approach LOS					B	B

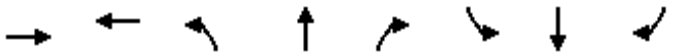
Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	33.4%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	0	0	13	0	1	0	0	18	3	1	0
Future Volume (vph)	0	0	0	13	0	1	0	0	18	3	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	14	0	1	0	0	20	3	1	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	0	15	20	4
Volume Left (vph)	0	14	0	3
Volume Right (vph)	0	1	20	0
Hadj (s)	0.00	0.15	-0.60	0.15
Departure Headway (s)	4.0	4.1	3.3	4.1
Degree Utilization, x	0.00	0.02	0.02	0.00
Capacity (veh/h)	900	870	1070	869
Control Delay (s)	7.0	7.2	6.4	7.1
Approach Delay (s)	0.0	7.2	6.4	7.1
Approach LOS	A	A	A	A

Intersection Summary				
Delay	6.8			
Level of Service	A			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A	
Analysis Period (min)	15			

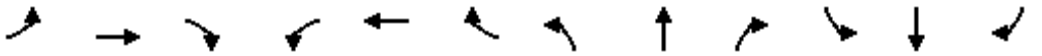


Lane Group	EBT	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	20	71	2	407	49	8	651	10
v/c Ratio	0.05	0.17	0.01	0.30	0.04	0.01	0.47	0.01
Control Delay	17.6	15.6	5.5	6.2	2.1	5.4	7.9	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.6	15.6	5.5	6.2	2.1	5.4	7.9	0.2
Queue Length 50th (m)	1.2	3.5	0.1	18.7	0.0	0.3	35.5	0.0
Queue Length 95th (m)	6.4	14.3	0.7	34.0	3.1	1.6	63.6	0.3
Internal Link Dist (m)	330.5	47.0		782.7			84.7	
Turn Bay Length (m)			113.0		180.0	50.0		15.0
Base Capacity (vph)	977	971	434	1761	1444	803	1779	1378
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	0.02	0.07	0.00	0.23	0.03	0.01	0.37	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	2	1	46	5	15	2	374	45	7	599	9
Future Volume (vph)	16	2	1	46	5	15	2	374	45	7	599	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.99			0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96			0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1830			1733		1217	1883	1541	1560	1902	1471
Flt Permitted		0.74			0.78		0.36	1.00	1.00	0.52	1.00	1.00
Satd. Flow (perm)		1412			1396		464	1883	1541	859	1902	1471
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	2	1	50	5	16	2	407	49	8	651	10
RTOR Reduction (vph)	0	1	0	0	14	0	0	0	21	0	0	4
Lane Group Flow (vph)	0	19	0	0	57	0	2	407	28	8	651	6
Heavy Vehicles (%)	0%	0%	0%	0%	0%	17%	50%	2%	6%	17%	1%	11%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		5.0			5.0		24.2	24.2	24.2	24.2	24.2	24.2
Effective Green, g (s)		5.0			5.0		24.2	24.2	24.2	24.2	24.2	24.2
Actuated g/C Ratio		0.12			0.12		0.57	0.57	0.57	0.57	0.57	0.57
Clearance Time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Grp Cap (vph)		167			165		266	1079	883	492	1090	843
v/s Ratio Prot								0.22			c0.34	
v/s Ratio Perm		0.01			c0.04		0.00		0.02	0.01		0.00
v/c Ratio		0.11			0.34		0.01	0.38	0.03	0.02	0.60	0.01
Uniform Delay, d1		16.6			17.1		3.9	4.9	3.9	3.9	5.8	3.9
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.3			1.3		0.0	0.4	0.0	0.0	1.2	0.0
Delay (s)		16.9			18.4		3.9	5.3	3.9	3.9	7.0	3.9
Level of Service		B			B		A	A	A	A	A	A
Approach Delay (s)		16.9			18.4			5.1			6.9	
Approach LOS		B			B			A			A	

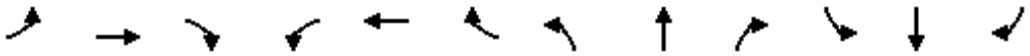
Intersection Summary			
HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	42.2	Sum of lost time (s)	13.0
Intersection Capacity Utilization	50.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	47	3	0	51	0	22	0	4	0	0	3
Future Volume (Veh/h)	5	47	3	0	51	0	22	0	4	0	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	51	3	0	55	0	24	0	4	0	0	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		71										
pX, platoon unblocked												
vC, conflicting volume	55			54			120	118	52	122	119	55
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	55			54			120	118	52	122	119	55
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			97	100	100	100	100	100
cM capacity (veh/h)	1563			1564			823	774	1021	853	773	1018

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	59	55	28	3
Volume Left	5	0	24	0
Volume Right	3	0	4	3
cSH	1563	1564	846	1018
Volume to Capacity	0.00	0.00	0.03	0.00
Queue Length 95th (m)	0.1	0.0	0.8	0.1
Control Delay (s)	0.6	0.0	9.4	8.5
Lane LOS	A		A	A
Approach Delay (s)	0.6	0.0	9.4	8.5
Approach LOS			A	A

Intersection Summary				
Average Delay	2.3			
Intersection Capacity Utilization	21.6%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	15	4	10	22	7	2	55	2	7	57	5
Future Volume (Veh/h)	7	15	4	10	22	7	2	55	2	7	57	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	16	4	11	24	8	2	60	2	8	62	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	166	146	64	158	148	61	67			62		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	166	146	64	158	148	61	67			62		
tC, single (s)	7.1	6.6	6.2	7.2	6.5	6.4	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.6	4.0	3.5	2.2			2.2		
p0 queue free %	99	98	100	99	97	99	100			99		
cM capacity (veh/h)	773	729	1005	766	742	964	1547			1554		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	28	43	64	75
Volume Left	8	11	2	8
Volume Right	4	8	2	5
cSH	772	782	1547	1554
Volume to Capacity	0.04	0.05	0.00	0.01
Queue Length 95th (m)	0.9	1.3	0.0	0.1
Control Delay (s)	9.8	9.9	0.2	0.8
Lane LOS	A	A	A	A
Approach Delay (s)	9.8	9.9	0.2	0.8
Approach LOS	A	A		

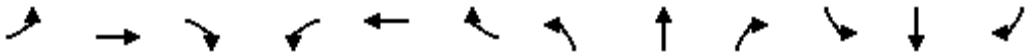
Intersection Summary				
Average Delay	3.7			
Intersection Capacity Utilization	16.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	230	246	112	46	259	58	79	220	67	166	417
v/c Ratio	0.51	0.32	0.15	0.10	0.34	0.09	0.25	0.45	0.23	0.34	0.58
Control Delay	15.2	10.8	2.9	9.4	11.0	3.3	17.6	16.2	17.6	17.7	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.2	10.8	2.9	9.4	11.0	3.3	17.6	16.2	17.6	17.7	5.9
Queue Length 50th (m)	12.0	11.7	0.0	2.0	12.4	0.0	4.6	11.0	3.9	9.9	0.0
Queue Length 95th (m)	32.5	28.6	6.6	7.4	30.1	4.7	16.4	33.3	14.6	28.7	17.6
Internal Link Dist (m)		197.3			831.7			297.4		206.2	
Turn Bay Length (m)	160.0		120.0	150.0		115.0	110.0		145.0		85.0
Base Capacity (vph)	848	1444	1278	866	1444	1206	823	1202	754	1250	1206
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	0.27	0.17	0.09	0.05	0.18	0.05	0.10	0.18	0.09	0.13	0.35

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	212	226	103	42	238	53	73	131	72	62	153	384
Future Volume (vph)	212	226	103	42	238	53	73	131	72	62	153	384
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
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)	1755	1883	1633	1772	1883	1555	1825	1807		1755	1902	1617
Flt Permitted	0.60	1.00	1.00	0.61	1.00	1.00	0.65	1.00		0.62	1.00	1.00
Satd. Flow (perm)	1107	1883	1633	1131	1883	1555	1253	1807		1147	1902	1617
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	230	246	112	46	259	58	79	142	78	67	166	417
RTOR Reduction (vph)	0	0	66	0	0	34	0	29	0	0	0	309
Lane Group Flow (vph)	230	246	46	46	259	24	79	191	0	67	166	108
Heavy Vehicles (%)	4%	2%	0%	3%	2%	5%	0%	1%	0%	4%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	19.2	19.2	19.2	19.2	19.2	19.2	12.0	12.0		12.0	12.0	12.0
Effective Green, g (s)	19.2	19.2	19.2	19.2	19.2	19.2	12.0	12.0		12.0	12.0	12.0
Actuated g/C Ratio	0.41	0.41	0.41	0.41	0.41	0.41	0.26	0.26		0.26	0.26	0.26
Clearance Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	457	777	674	466	777	642	323	466		296	490	417
v/s Ratio Prot		0.13			0.14			c0.11			0.09	
v/s Ratio Perm	c0.21		0.03	0.04		0.02	0.06			0.06		0.07
v/c Ratio	0.50	0.32	0.07	0.10	0.33	0.04	0.24	0.41		0.23	0.34	0.26
Uniform Delay, d1	10.1	9.2	8.2	8.4	9.3	8.1	13.7	14.3		13.6	14.0	13.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.5	0.4	0.1	0.2	0.4	0.0	0.4	0.6		0.4	0.4	0.3
Delay (s)	11.6	9.6	8.3	8.5	9.7	8.2	14.1	14.9		14.0	14.4	14.0
Level of Service	B	A	A	A	A	A	B	B		B	B	B
Approach Delay (s)		10.2			9.3			14.7			14.1	
Approach LOS		B			A			B			B	

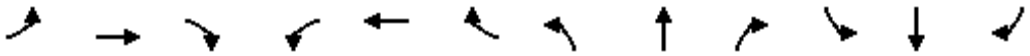
Intersection Summary			
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	46.5	Sum of lost time (s)	15.3
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	274	5	0	272	30	1	10	2	20	21	41
Future Volume (Veh/h)	24	274	5	0	272	30	1	10	2	20	21	41
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	298	5	0	296	33	1	11	2	22	23	45
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	329			303			702	679	298	654	651	296
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	329			303			702	679	298	654	651	296
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.1	3.4
p0 queue free %	98			100			100	97	100	94	94	94
cM capacity (veh/h)	1214			1269			312	368	746	367	374	727

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	324	5	296	33	14	90
Volume Left	26	0	0	0	1	22
Volume Right	0	5	0	33	2	45
cSH	1214	1700	1269	1700	391	491
Volume to Capacity	0.02	0.00	0.00	0.02	0.04	0.18
Queue Length 95th (m)	0.5	0.0	0.0	0.0	0.8	5.0
Control Delay (s)	0.8	0.0	0.0	0.0	14.5	14.0
Lane LOS	A				B	B
Approach Delay (s)	0.8		0.0		14.5	14.0
Approach LOS					B	B

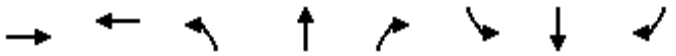
Intersection Summary				
Average Delay	2.3			
Intersection Capacity Utilization	50.2%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	1	6	6	2	1	2	1	14	4	1	0
Future Volume (vph)	0	1	6	6	2	1	2	1	14	4	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1	7	7	2	1	2	1	15	4	1	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	8	10	18	5
Volume Left (vph)	0	7	2	4
Volume Right (vph)	7	1	15	0
Hadj (s)	0.18	0.64	-0.29	1.86
Departure Headway (s)	4.1	4.6	3.7	5.8
Degree Utilization, x	0.01	0.01	0.02	0.01
Capacity (veh/h)	858	774	975	604
Control Delay (s)	7.2	7.7	6.7	8.9
Approach Delay (s)	7.2	7.7	6.7	8.9
Approach LOS	A	A	A	A

Intersection Summary				
Delay	7.3			
Level of Service	A			
Intersection Capacity Utilization	15.5%	ICU Level of Service	A	
Analysis Period (min)	15			

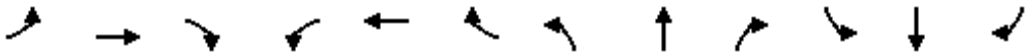


Lane Group	EBT	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	16	58	1	610	32	16	368	9
v/c Ratio	0.05	0.16	0.00	0.46	0.03	0.04	0.28	0.01
Control Delay	16.3	14.6	5.0	7.8	2.1	5.9	6.2	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.3	14.6	5.0	7.8	2.1	5.9	6.2	0.1
Queue Length 50th (m)	0.8	2.5	0.0	32.8	0.0	0.6	16.6	0.0
Queue Length 95th (m)	5.2	11.6	0.5	58.6	2.2	2.6	30.6	0.2
Internal Link Dist (m)	330.5	47.0		782.7			84.7	
Turn Bay Length (m)			113.0		180.0	50.0		15.0
Base Capacity (vph)	774	831	982	1743	1255	561	1710	1119
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	0.02	0.07	0.00	0.35	0.03	0.03	0.22	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	1	3	34	3	17	1	561	29	15	339	8
Future Volume (vph)	11	1	3	34	3	17	1	561	29	15	339	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.97			0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96			0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1427			1428		1825	1847	1328	1437	1812	1183
Flt Permitted		0.74			0.80		0.54	1.00	1.00	0.39	1.00	1.00
Satd. Flow (perm)		1099			1174		1042	1847	1328	595	1812	1183
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	1	3	37	3	18	1	610	32	16	368	9
RTOR Reduction (vph)	0	3	0	0	16	0	0	0	14	0	0	4
Lane Group Flow (vph)	0	13	0	0	42	0	1	610	18	16	368	5
Heavy Vehicles (%)	27%	0%	33%	24%	0%	31%	0%	4%	23%	27%	6%	38%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		4.8			4.8		22.9	22.9	22.9	22.9	22.9	22.9
Effective Green, g (s)		4.8			4.8		22.9	22.9	22.9	22.9	22.9	22.9
Actuated g/C Ratio		0.12			0.12		0.56	0.56	0.56	0.56	0.56	0.56
Clearance Time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Grp Cap (vph)		129			138		586	1039	747	334	1019	665
v/s Ratio Prot								c0.33			0.20	
v/s Ratio Perm		0.01			c0.04		0.00		0.01	0.03		0.00
v/c Ratio		0.10			0.31		0.00	0.59	0.02	0.05	0.36	0.01
Uniform Delay, d1		16.0			16.4		3.9	5.8	3.9	4.0	4.9	3.9
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.4			1.3		0.0	1.2	0.0	0.1	0.4	0.0
Delay (s)		16.4			17.7		3.9	7.0	4.0	4.1	5.3	3.9
Level of Service		B			B		A	A	A	A	A	A
Approach Delay (s)		16.4			17.7			6.8			5.2	
Approach LOS		B			B			A			A	

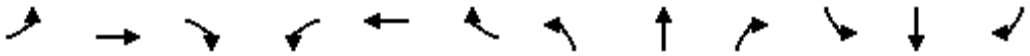
Intersection Summary			
HCM 2000 Control Delay	6.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	40.7	Sum of lost time (s)	13.0
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	29	11	0	46	2	4	0	0	0	0	3
Future Volume (Veh/h)	1	29	11	0	46	2	4	0	0	0	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	32	12	0	50	2	4	0	0	0	0	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		71										
pX, platoon unblocked												
vC, conflicting volume	52			44			94	92	38	91	97	51
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	52			44			94	92	38	91	97	51
tC, single (s)	4.1			4.1			8.1	6.5	6.2	7.1	6.5	6.5
tC, 2 stage (s)												
tF (s)	2.2			2.2			4.4	4.0	3.3	3.5	4.0	3.6
p0 queue free %	100			100			99	100	100	100	100	100
cM capacity (veh/h)	1567			1577			698	801	1040	898	796	936

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	45	52	4	3
Volume Left	1	0	4	0
Volume Right	12	2	0	3
cSH	1567	1577	698	936
Volume to Capacity	0.00	0.00	0.01	0.00
Queue Length 95th (m)	0.0	0.0	0.1	0.1
Control Delay (s)	0.2	0.0	10.2	8.9
Lane LOS	A		B	A
Approach Delay (s)	0.2	0.0	10.2	8.9
Approach LOS			B	A

Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	24	0	5	20	8	4	50	23	27	36	0
Future Volume (Veh/h)	3	24	0	5	20	8	4	50	23	27	36	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	26	0	5	22	9	4	54	25	29	39	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)												
pX, platoon unblocked												
vC, conflicting volume	192	184	39	184	172	66	39			79		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	192	184	39	184	172	66	39			79		
tC, single (s)	7.1	6.6	6.2	7.8	6.7	6.2	4.4			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	4.2	4.2	3.3	2.5			2.2		
p0 queue free %	100	96	100	99	97	99	100			98		
cM capacity (veh/h)	734	688	1038	612	675	1003	1393			1500		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	29	36	83	68
Volume Left	3	5	4	29
Volume Right	0	9	25	0
cSH	692	724	1393	1500
Volume to Capacity	0.04	0.05	0.00	0.02
Queue Length 95th (m)	1.0	1.2	0.1	0.4
Control Delay (s)	10.4	10.2	0.4	3.3
Lane LOS	B	B	A	A
Approach Delay (s)	10.4	10.2	0.4	3.3
Approach LOS	B	B		

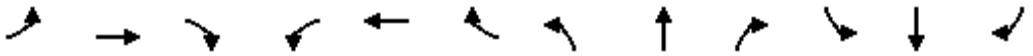
Intersection Summary				
Average Delay	4.3			
Intersection Capacity Utilization	20.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	261	154	46	77	284	91	89	287	30	123	248
v/c Ratio	0.61	0.21	0.07	0.15	0.39	0.13	0.26	0.56	0.11	0.25	0.42
Control Delay	19.0	10.7	2.7	10.5	12.5	3.2	18.5	20.6	17.3	17.6	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
Total Delay	19.0	10.7	2.7	10.5	12.5	3.2	18.5	20.6	17.3	17.6	5.4
Queue Length 50th (m)	16.2	7.8	0.0	3.8	15.8	0.0	5.7	18.4	1.9	7.9	0.0
Queue Length 95th (m)	43.6	21.0	3.7	12.3	38.0	6.4	19.3	50.3	8.7	24.3	14.5
Internal Link Dist (m)		197.3			831.7			297.4		206.2	
Turn Bay Length (m)	160.0		120.0	150.0		115.0	110.0		145.0		85.0
Base Capacity (vph)	747	1276	1081	890	1253	1141	785	1123	605	1103	1025
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	0.35	0.12	0.04	0.09	0.23	0.08	0.11	0.26	0.05	0.11	0.24

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	240	142	42	71	261	84	82	197	67	28	113	228
Future Volume (vph)	240	142	42	71	261	84	82	197	67	28	113	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
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)	1690	1779	1484	1789	1746	1555	1789	1812		1601	1795	1512
Flt Permitted	0.59	1.00	1.00	0.66	1.00	1.00	0.68	1.00		0.58	1.00	1.00
Satd. Flow (perm)	1042	1779	1484	1242	1746	1555	1277	1812		984	1795	1512
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	261	154	46	77	284	91	89	214	73	30	123	248
RTOR Reduction (vph)	0	0	27	0	0	53	0	17	0	0	0	180
Lane Group Flow (vph)	261	154	19	77	284	38	89	270	0	30	123	68
Heavy Vehicles (%)	8%	8%	10%	2%	10%	5%	2%	2%	2%	14%	7%	8%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	21.2	21.2	21.2	21.2	21.2	21.2	13.9	13.9		13.9	13.9	13.9
Effective Green, g (s)	21.2	21.2	21.2	21.2	21.2	21.2	13.9	13.9		13.9	13.9	13.9
Actuated g/C Ratio	0.42	0.42	0.42	0.42	0.42	0.42	0.28	0.28		0.28	0.28	0.28
Clearance Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	438	748	624	522	734	654	352	499		271	495	417
v/s Ratio Prot		0.09			0.16			c0.15			0.07	
v/s Ratio Perm	c0.25		0.01	0.06		0.02	0.07			0.03		0.05
v/c Ratio	0.60	0.21	0.03	0.15	0.39	0.06	0.25	0.54		0.11	0.25	0.16
Uniform Delay, d1	11.3	9.3	8.6	9.0	10.1	8.7	14.2	15.5		13.6	14.2	13.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.9	0.2	0.0	0.2	0.6	0.1	0.4	1.2		0.2	0.3	0.2
Delay (s)	14.2	9.5	8.6	9.2	10.7	8.7	14.6	16.7		13.8	14.5	14.0
Level of Service	B	A	A	A	B	A	B	B		B	B	B
Approach Delay (s)		12.1			10.1			16.2			14.1	
Approach LOS		B			B			B			B	

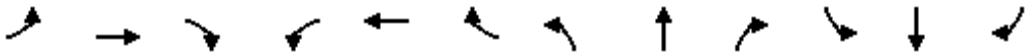
Intersection Summary			
HCM 2000 Control Delay	12.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	50.4	Sum of lost time (s)	15.3
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	189	0	0	326	16	5	13	0	20	7	27
Future Volume (Veh/h)	17	189	0	0	326	16	5	13	0	20	7	27
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	205	0	0	354	17	5	14	0	22	8	29
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	371			205			628	612	205	602	595	354
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	371			205			628	612	205	602	595	354
tC, single (s)	4.4			4.1			7.1	6.5	6.2	7.2	6.5	6.5
tC, 2 stage (s)												
tF (s)	2.5			2.2			3.5	4.0	3.3	3.6	4.0	3.5
p0 queue free %	98			100			99	97	100	94	98	95
cM capacity (veh/h)	1045			1378			370	404	841	388	413	641

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	223	0	354	17	19	59
Volume Left	18	0	0	0	5	22
Volume Right	0	0	0	17	0	29
cSH	1045	1700	1378	1700	394	487
Volume to Capacity	0.02	0.00	0.00	0.01	0.05	0.12
Queue Length 95th (m)	0.4	0.0	0.0	0.0	1.2	3.1
Control Delay (s)	0.8	0.0	0.0	0.0	14.6	13.4
Lane LOS	A				B	B
Approach Delay (s)	0.8		0.0		14.6	13.4
Approach LOS					B	B

Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	35.4%	ICU Level of Service		A
Analysis Period (min)	15			



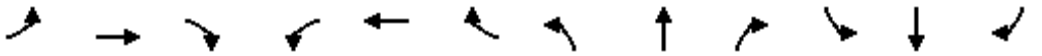
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	0	0	13	0	1	0	0	18	3	1	0
Future Volume (vph)	0	0	0	13	0	1	0	0	18	3	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	14	0	1	0	0	20	3	1	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	0	15	20	4
Volume Left (vph)	0	14	0	3
Volume Right (vph)	0	1	20	0
Hadj (s)	0.00	0.15	-0.60	0.15
Departure Headway (s)	4.0	4.1	3.3	4.1
Degree Utilization, x	0.00	0.02	0.02	0.00
Capacity (veh/h)	900	870	1070	869
Control Delay (s)	7.0	7.2	6.4	7.1
Approach Delay (s)	0.0	7.2	6.4	7.1
Approach LOS	A	A	A	A

Intersection Summary				
Delay	6.8			
Level of Service	A			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A	
Analysis Period (min)	15			

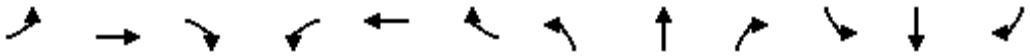
Lane Group	EBT	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	20	76	2	440	52	9	703	10
v/c Ratio	0.05	0.19	0.01	0.32	0.05	0.01	0.50	0.01
Control Delay	19.3	17.1	5.0	6.0	2.0	5.2	7.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.3	17.1	5.0	6.0	2.0	5.2	7.9	0.1
Queue Length 50th (m)	1.3	4.2	0.1	20.7	0.0	0.3	40.0	0.0
Queue Length 95th (m)	6.8	16.1	0.7	37.5	3.1	1.7	71.6	0.3
Internal Link Dist (m)	330.5	47.0		782.7			84.7	
Turn Bay Length (m)			113.0		180.0	50.0		15.0
Base Capacity (vph)	928	922	381	1698	1394	750	1715	1330
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	0.02	0.08	0.01	0.26	0.04	0.01	0.41	0.01

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	2	1	50	5	16	2	405	48	8	647	9
Future Volume (vph)	16	2	1	50	5	16	2	405	48	8	647	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.99			0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96			0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1830			1733		1217	1883	1541	1560	1902	1471
Flt Permitted		0.74			0.78		0.33	1.00	1.00	0.51	1.00	1.00
Satd. Flow (perm)		1412			1394		423	1883	1541	833	1902	1471
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	2	1	54	5	17	2	440	52	9	703	10
RTOR Reduction (vph)	0	1	0	0	15	0	0	0	21	0	0	4
Lane Group Flow (vph)	0	19	0	0	61	0	2	440	31	9	703	6
Heavy Vehicles (%)	0%	0%	0%	0%	0%	17%	50%	2%	6%	17%	1%	11%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		5.0			5.0		26.7	26.7	26.7	26.7	26.7	26.7
Effective Green, g (s)		5.0			5.0		26.7	26.7	26.7	26.7	26.7	26.7
Actuated g/C Ratio		0.11			0.11		0.60	0.60	0.60	0.60	0.60	0.60
Clearance Time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Grp Cap (vph)		157			155		252	1124	920	497	1136	878
v/s Ratio Prot								0.23			c0.37	
v/s Ratio Perm		0.01			c0.04		0.00		0.02	0.01		0.00
v/c Ratio		0.12			0.39		0.01	0.39	0.03	0.02	0.62	0.01
Uniform Delay, d1		17.9			18.4		3.6	4.7	3.7	3.7	5.7	3.6
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.3			1.6		0.0	0.4	0.0	0.0	1.3	0.0
Delay (s)		18.2			20.1		3.7	5.1	3.7	3.7	7.1	3.6
Level of Service		B			C		A	A	A	A	A	A
Approach Delay (s)		18.2			20.1			5.0			7.0	
Approach LOS		B			C			A			A	

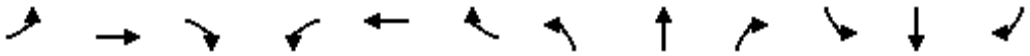
Intersection Summary			
HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	44.7	Sum of lost time (s)	13.0
Intersection Capacity Utilization	53.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	51	3	0	55	0	22	0	4	0	0	3
Future Volume (Veh/h)	5	51	3	0	55	0	22	0	4	0	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	55	3	0	60	0	24	0	4	0	0	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		71										
pX, platoon unblocked												
vC, conflicting volume	60			58			130	126	56	130	128	60
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	60			58			130	126	56	130	128	60
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			97	100	100	100	100	100
cM capacity (veh/h)	1556			1559			812	765	1016	841	764	1011

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	63	60	28	3
Volume Left	5	0	24	0
Volume Right	3	0	4	3
cSH	1556	1559	836	1011
Volume to Capacity	0.00	0.00	0.03	0.00
Queue Length 95th (m)	0.1	0.0	0.8	0.1
Control Delay (s)	0.6	0.0	9.5	8.6
Lane LOS	A		A	A
Approach Delay (s)	0.6	0.0	9.5	8.6
Approach LOS			A	A

Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	21.8%	ICU Level of Service	A	
Analysis Period (min)	15			



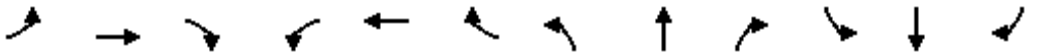
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	16	4	11	24	8	3	59	3	8	62	5
Future Volume (Veh/h)	8	16	4	11	24	8	3	59	3	8	62	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	17	4	12	26	9	3	64	3	9	67	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	181	160	70	172	162	66	72			67		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	181	160	70	172	162	66	72			67		
tC, single (s)	7.1	6.6	6.2	7.2	6.5	6.4	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.6	4.0	3.5	2.2			2.2		
p0 queue free %	99	98	100	98	96	99	100			99		
cM capacity (veh/h)	752	715	999	749	729	958	1541			1547		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	30	47	70	81
Volume Left	9	12	3	9
Volume Right	4	9	3	5
cSH	755	769	1541	1547
Volume to Capacity	0.04	0.06	0.00	0.01
Queue Length 95th (m)	0.9	1.5	0.0	0.1
Control Delay (s)	10.0	10.0	0.3	0.9
Lane LOS	A	A	A	A
Approach Delay (s)	10.0	10.0	0.3	0.9
Approach LOS	A	A		

Intersection Summary				
Average Delay	3.8			
Intersection Capacity Utilization	16.6%	ICU Level of Service	A	
Analysis Period (min)	15			

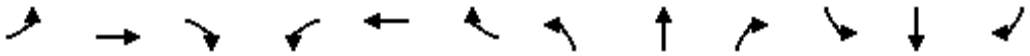
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	249	265	121	50	279	63	86	239	73	179	451
v/c Ratio	0.55	0.34	0.16	0.11	0.35	0.09	0.27	0.49	0.25	0.37	0.60
Control Delay	16.0	10.9	2.8	9.4	11.1	3.2	19.0	17.8	19.0	19.0	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.0	10.9	2.8	9.4	11.1	3.2	19.0	17.8	19.0	19.0	6.2
Queue Length 50th (m)	13.7	13.0	0.0	2.2	13.9	0.0	5.3	12.9	4.5	11.4	0.0
Queue Length 95th (m)	36.7	31.5	6.8	8.1	33.2	4.9	18.7	38.5	16.5	32.9	18.8
Internal Link Dist (m)		197.3			831.7			297.4		206.2	
Turn Bay Length (m)	160.0		120.0	150.0		115.0	110.0		145.0		85.0
Base Capacity (vph)	806	1398	1243	825	1398	1170	787	1165	717	1210	1193
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	0.31	0.19	0.10	0.06	0.20	0.05	0.11	0.21	0.10	0.15	0.38

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	229	244	111	46	257	58	79	142	78	67	165	415
Future Volume (vph)	229	244	111	46	257	58	79	142	78	67	165	415
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
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)	1755	1883	1633	1772	1883	1555	1825	1807		1755	1902	1617
Flt Permitted	0.59	1.00	1.00	0.60	1.00	1.00	0.64	1.00		0.61	1.00	1.00
Satd. Flow (perm)	1087	1883	1633	1111	1883	1555	1238	1807		1127	1902	1617
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	249	265	121	50	279	63	86	154	85	73	179	451
RTOR Reduction (vph)	0	0	70	0	0	36	0	30	0	0	0	334
Lane Group Flow (vph)	249	265	51	50	279	27	86	209	0	73	179	117
Heavy Vehicles (%)	4%	2%	0%	3%	2%	5%	0%	1%	0%	4%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	20.5	20.5	20.5	20.5	20.5	20.5	12.5	12.5		12.5	12.5	12.5
Effective Green, g (s)	20.5	20.5	20.5	20.5	20.5	20.5	12.5	12.5		12.5	12.5	12.5
Actuated g/C Ratio	0.42	0.42	0.42	0.42	0.42	0.42	0.26	0.26		0.26	0.26	0.26
Clearance Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	461	799	693	471	799	659	320	467		291	492	418
v/s Ratio Prot		0.14			0.15			c0.12			0.09	
v/s Ratio Perm	c0.23		0.03	0.04		0.02	0.07			0.06		0.07
v/c Ratio	0.54	0.33	0.07	0.11	0.35	0.04	0.27	0.45		0.25	0.36	0.28
Uniform Delay, d1	10.4	9.3	8.3	8.4	9.4	8.1	14.3	15.0		14.2	14.6	14.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.9	0.4	0.1	0.2	0.5	0.0	0.5	0.7		0.5	0.5	0.4
Delay (s)	12.3	9.7	8.3	8.6	9.9	8.2	14.7	15.7		14.6	15.1	14.7
Level of Service	B	A	A	A	A	A	B	B		B	B	B
Approach Delay (s)		10.5			9.4			15.4			14.8	
Approach LOS		B			A			B			B	

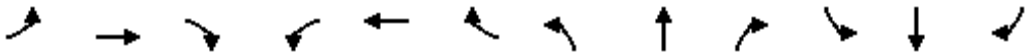
Intersection Summary			
HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	48.3	Sum of lost time (s)	15.3
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	296	5	0	293	32	1	11	3	21	23	44
Future Volume (Veh/h)	25	296	5	0	293	32	1	11	3	21	23	44
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	322	5	0	318	35	1	12	3	23	25	48
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	353			327			754	729	322	703	699	318
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	353			327			754	729	322	703	699	318
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.1	3.4
p0 queue free %	98			100			100	97	100	93	93	93
cM capacity (veh/h)	1189			1244			284	344	724	338	351	707

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	349	5	318	35	16	96
Volume Left	27	0	0	0	1	23
Volume Right	0	5	0	35	3	48
cSH	1189	1700	1244	1700	376	463
Volume to Capacity	0.02	0.00	0.00	0.02	0.04	0.21
Queue Length 95th (m)	0.5	0.0	0.0	0.0	1.0	5.9
Control Delay (s)	0.8	0.0	0.0	0.0	15.0	14.8
Lane LOS	A				B	B
Approach Delay (s)	0.8		0.0		15.0	14.8
Approach LOS					B	B

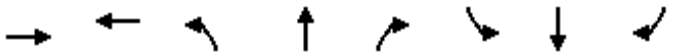
Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	53.8%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	1	6	6	2	1	2	1	14	4	1	0
Future Volume (vph)	0	1	6	6	2	1	2	1	14	4	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1	7	7	2	1	2	1	15	4	1	0

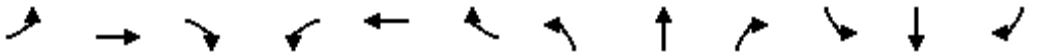
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	8	10	18	5
Volume Left (vph)	0	7	2	4
Volume Right (vph)	7	1	15	0
Hadj (s)	0.18	0.64	-0.29	1.86
Departure Headway (s)	4.1	4.6	3.7	5.8
Degree Utilization, x	0.01	0.01	0.02	0.01
Capacity (veh/h)	858	774	975	604
Control Delay (s)	7.2	7.7	6.7	8.9
Approach Delay (s)	7.2	7.7	6.7	8.9
Approach LOS	A	A	A	A

Intersection Summary				
Delay	7.3			
Level of Service	A			
Intersection Capacity Utilization	15.5%	ICU Level of Service	A	
Analysis Period (min)	15			



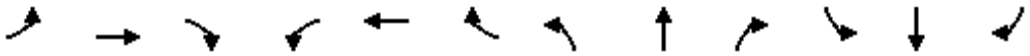
Lane Group	EBT	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	16	63	1	655	35	17	396	9
v/c Ratio	0.05	0.17	0.00	0.49	0.04	0.04	0.30	0.01
Control Delay	17.5	15.4	5.0	7.9	2.1	5.8	6.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.5	15.4	5.0	7.9	2.1	5.8	6.1	0.0
Queue Length 50th (m)	0.9	2.9	0.0	36.6	0.0	0.6	18.3	0.0
Queue Length 95th (m)	5.5	12.9	0.5	65.8	2.5	2.7	33.6	0.2
Internal Link Dist (m)	330.5	47.0		782.7			84.7	
Turn Bay Length (m)			113.0		180.0	50.0		15.0
Base Capacity (vph)	753	813	929	1693	1220	502	1661	1087
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	0.02	0.08	0.00	0.39	0.03	0.03	0.24	0.01

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	1	3	36	3	19	1	603	32	16	364	8
Future Volume (vph)	11	1	3	36	3	19	1	603	32	16	364	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.97			0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96			0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1427			1421		1825	1847	1328	1437	1812	1183
Flt Permitted		0.74			0.80		0.53	1.00	1.00	0.36	1.00	1.00
Satd. Flow (perm)		1094			1175		1015	1847	1328	547	1812	1183
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	1	3	39	3	21	1	655	35	17	396	9
RTOR Reduction (vph)	0	3	0	0	19	0	0	0	15	0	0	4
Lane Group Flow (vph)	0	13	0	0	44	0	1	655	20	17	396	5
Heavy Vehicles (%)	27%	0%	33%	24%	0%	31%	0%	4%	23%	27%	6%	38%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		4.8			4.8		24.5	24.5	24.5	24.5	24.5	24.5
Effective Green, g (s)		4.8			4.8		24.5	24.5	24.5	24.5	24.5	24.5
Actuated g/C Ratio		0.11			0.11		0.58	0.58	0.58	0.58	0.58	0.58
Clearance Time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Grp Cap (vph)		124			133		587	1069	769	316	1049	685
v/s Ratio Prot								c0.35			0.22	
v/s Ratio Perm		0.01			c0.04		0.00		0.02	0.03		0.00
v/c Ratio		0.11			0.33		0.00	0.61	0.03	0.05	0.38	0.01
Uniform Delay, d1		16.8			17.3		3.7	5.8	3.8	3.9	4.8	3.8
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.4			1.5		0.0	1.4	0.0	0.1	0.4	0.0
Delay (s)		17.2			18.8		3.8	7.2	3.8	4.0	5.2	3.8
Level of Service		B			B		A	A	A	A	A	A
Approach Delay (s)		17.2			18.8			7.0			5.1	
Approach LOS		B			B			A			A	

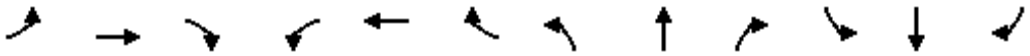
Intersection Summary			
HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	42.3	Sum of lost time (s)	13.0
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	32	11	0	49	2	4	0	0	0	0	3
Future Volume (Veh/h)	1	32	11	0	49	2	4	0	0	0	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	35	12	0	53	2	4	0	0	0	0	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		71										
pX, platoon unblocked												
vC, conflicting volume	55			47			100	98	41	97	103	54
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	55			47			100	98	41	97	103	54
tC, single (s)	4.1			4.1			8.1	6.5	6.2	7.1	6.5	6.5
tC, 2 stage (s)												
tF (s)	2.2			2.2			4.4	4.0	3.3	3.5	4.0	3.6
p0 queue free %	100			100			99	100	100	100	100	100
cM capacity (veh/h)	1563			1573			691	795	1036	890	790	932

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	48	55	4	3
Volume Left	1	0	4	0
Volume Right	12	2	0	3
cSH	1563	1573	691	932
Volume to Capacity	0.00	0.00	0.01	0.00
Queue Length 95th (m)	0.0	0.0	0.1	0.1
Control Delay (s)	0.2	0.0	10.2	8.9
Lane LOS	A		B	A
Approach Delay (s)	0.2	0.0	10.2	8.9
Approach LOS			B	A

Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	26	0	6	22	9	4	53	24	29	39	0
Future Volume (Veh/h)	3	26	0	6	22	9	4	53	24	29	39	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	28	0	7	24	10	4	58	26	32	42	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)												
pX, platoon unblocked												
vC, conflicting volume	207	198	42	199	185	71	42			84		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	207	198	42	199	185	71	42			84		
tC, single (s)	7.1	6.6	6.2	7.8	6.7	6.2	4.4			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	4.2	4.2	3.3	2.5			2.2		
p0 queue free %	100	96	100	99	96	99	100			98		
cM capacity (veh/h)	713	674	1034	595	662	997	1389			1494		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	31	41	88	74
Volume Left	3	7	4	32
Volume Right	0	10	26	0
cSH	678	706	1389	1494
Volume to Capacity	0.05	0.06	0.00	0.02
Queue Length 95th (m)	1.1	1.4	0.1	0.5
Control Delay (s)	10.6	10.4	0.4	3.3
Lane LOS	B	B	A	A
Approach Delay (s)	10.6	10.4	0.4	3.3
Approach LOS	B	B		

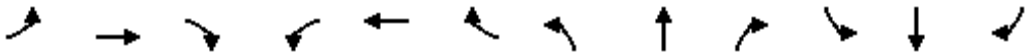
Intersection Summary				
Average Delay	4.4			
Intersection Capacity Utilization	20.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	280	166	49	83	305	99	96	308	33	132	266
v/c Ratio	0.65	0.22	0.07	0.16	0.42	0.14	0.27	0.59	0.13	0.26	0.43
Control Delay	21.4	11.3	3.0	11.1	13.3	3.2	19.0	21.5	17.8	18.1	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.4	11.3	3.0	11.1	13.3	3.2	19.0	21.5	17.8	18.1	5.3
Queue Length 50th (m)	18.9	9.0	0.0	4.4	18.1	0.0	6.7	21.7	2.2	9.2	0.0
Queue Length 95th (m)	50.2	23.3	4.0	13.6	42.5	6.9	20.7	54.1	9.2	25.6	14.8
Internal Link Dist (m)		197.3			831.7			297.4		206.2	
Turn Bay Length (m)	160.0		120.0	150.0		115.0	110.0		145.0		85.0
Base Capacity (vph)	699	1219	1036	841	1197	1097	745	1074	552	1055	998
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	0.40	0.14	0.05	0.10	0.25	0.09	0.13	0.29	0.06	0.13	0.27

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	258	153	45	76	281	91	88	212	72	30	121	245
Future Volume (vph)	258	153	45	76	281	91	88	212	72	30	121	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
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)	1690	1779	1484	1789	1746	1555	1789	1812		1601	1795	1512
Flt Permitted	0.57	1.00	1.00	0.65	1.00	1.00	0.67	1.00		0.56	1.00	1.00
Satd. Flow (perm)	1022	1779	1484	1228	1746	1555	1267	1812		938	1795	1512
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	280	166	49	83	305	99	96	230	78	33	132	266
RTOR Reduction (vph)	0	0	28	0	0	57	0	17	0	0	0	190
Lane Group Flow (vph)	280	166	21	83	305	42	96	291	0	33	132	76
Heavy Vehicles (%)	8%	8%	10%	2%	10%	5%	2%	2%	2%	14%	7%	8%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	22.6	22.6	22.6	22.6	22.6	22.6	15.1	15.1		15.1	15.1	15.1
Effective Green, g (s)	22.6	22.6	22.6	22.6	22.6	22.6	15.1	15.1		15.1	15.1	15.1
Actuated g/C Ratio	0.43	0.43	0.43	0.43	0.43	0.43	0.28	0.28		0.28	0.28	0.28
Clearance Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	435	758	632	523	744	663	360	516		267	511	430
v/s Ratio Prot		0.09			0.17			c0.16			0.07	
v/s Ratio Perm	c0.27		0.01	0.07		0.03	0.08			0.04		0.05
v/c Ratio	0.64	0.22	0.03	0.16	0.41	0.06	0.27	0.56		0.12	0.26	0.18
Uniform Delay, d1	12.0	9.6	8.8	9.4	10.6	9.0	14.7	16.1		14.0	14.6	14.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.0	0.3	0.0	0.2	0.6	0.1	0.4	1.4		0.2	0.3	0.2
Delay (s)	16.0	9.9	8.9	9.6	11.2	9.0	15.1	17.6		14.3	14.9	14.5
Level of Service	B	A	A	A	B	A	B	B		B	B	B
Approach Delay (s)		13.2			10.5			17.0			14.6	
Approach LOS		B			B			B			B	

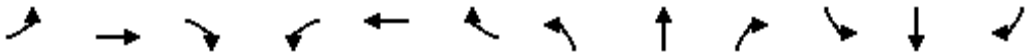
Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	53.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	203	0	0	350	17	6	14	0	22	7	29
Future Volume (Veh/h)	19	203	0	0	350	17	6	14	0	22	7	29
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	221	0	0	380	18	7	15	0	24	8	32
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	398			221			679	661	221	650	643	380
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	398			221			679	661	221	650	643	380
tC, single (s)	4.4			4.1			7.1	6.5	6.2	7.2	6.5	6.5
tC, 2 stage (s)												
tF (s)	2.5			2.2			3.5	4.0	3.3	3.6	4.0	3.5
p0 queue free %	98			100			98	96	100	93	98	95
cM capacity (veh/h)	1020			1360			338	377	824	358	386	619

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	242	0	380	18	22	64
Volume Left	21	0	0	0	7	24
Volume Right	0	0	0	18	0	32
cSH	1020	1700	1360	1700	364	459
Volume to Capacity	0.02	0.00	0.00	0.01	0.06	0.14
Queue Length 95th (m)	0.5	0.0	0.0	0.0	1.5	3.7
Control Delay (s)	0.9	0.0	0.0	0.0	15.5	14.1
Lane LOS	A				C	B
Approach Delay (s)	0.9		0.0		15.5	14.1
Approach LOS					C	B

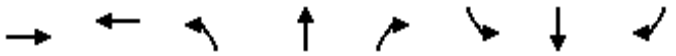
Intersection Summary				
Average Delay	2.0			
Intersection Capacity Utilization	38.0%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	0	0	13	0	1	0	0	18	3	1	0
Future Volume (vph)	0	0	0	13	0	1	0	0	18	3	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	14	0	1	0	0	20	3	1	0

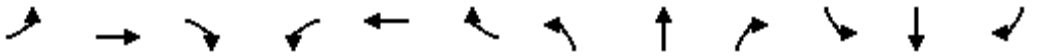
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	0	15	20	4
Volume Left (vph)	0	14	0	3
Volume Right (vph)	0	1	20	0
Hadj (s)	0.00	0.15	-0.60	0.15
Departure Headway (s)	4.0	4.1	3.3	4.1
Degree Utilization, x	0.00	0.02	0.02	0.00
Capacity (veh/h)	900	870	1070	869
Control Delay (s)	7.0	7.2	6.4	7.1
Approach Delay (s)	0.0	7.2	6.4	7.1
Approach LOS	A	A	A	A

Intersection Summary				
Delay	6.8			
Level of Service	A			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A	
Analysis Period (min)	15			



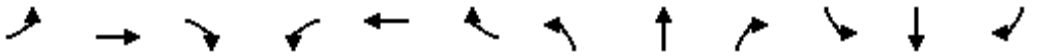
Lane Group	EBT	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	20	81	2	473	57	10	757	10
v/c Ratio	0.05	0.21	0.01	0.33	0.05	0.02	0.53	0.01
Control Delay	21.1	18.8	5.0	5.9	1.8	4.9	8.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.1	18.8	5.0	5.9	1.8	4.9	8.0	0.0
Queue Length 50th (m)	1.4	4.7	0.1	22.7	0.0	0.4	45.3	0.0
Queue Length 95th (m)	7.3	18.2	0.7	40.7	3.2	1.8	80.8	0.2
Internal Link Dist (m)	330.5	47.0		782.7			84.7	
Turn Bay Length (m)			113.0		180.0	50.0		15.0
Base Capacity (vph)	892	886	334	1645	1353	706	1661	1289
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	0.02	0.09	0.01	0.29	0.04	0.01	0.46	0.01

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	2	1	53	5	17	2	435	52	9	696	9
Future Volume (vph)	16	2	1	53	5	17	2	435	52	9	696	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.99			0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96			0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1830			1734		1217	1883	1541	1560	1902	1471
Flt Permitted		0.74			0.78		0.30	1.00	1.00	0.49	1.00	1.00
Satd. Flow (perm)		1412			1392		383	1883	1541	808	1902	1471
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	2	1	58	5	18	2	473	57	10	757	10
RTOR Reduction (vph)	0	1	0	0	16	0	0	0	22	0	0	4
Lane Group Flow (vph)	0	19	0	0	65	0	2	473	35	10	757	6
Heavy Vehicles (%)	0%	0%	0%	0%	0%	17%	50%	2%	6%	17%	1%	11%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		5.0			5.0		28.9	28.9	28.9	28.9	28.9	28.9
Effective Green, g (s)		5.0			5.0		28.9	28.9	28.9	28.9	28.9	28.9
Actuated g/C Ratio		0.11			0.11		0.62	0.62	0.62	0.62	0.62	0.62
Clearance Time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Grp Cap (vph)		150			148		236	1160	949	497	1172	906
v/s Ratio Prot								0.25			c0.40	
v/s Ratio Perm		0.01			c0.05		0.01		0.02	0.01		0.00
v/c Ratio		0.13			0.44		0.01	0.41	0.04	0.02	0.65	0.01
Uniform Delay, d1		19.0			19.6		3.5	4.6	3.5	3.5	5.7	3.5
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.4			2.1		0.0	0.4	0.0	0.0	1.5	0.0
Delay (s)		19.4			21.7		3.5	5.0	3.6	3.5	7.3	3.5
Level of Service		B			C		A	A	A	A	A	A
Approach Delay (s)		19.4			21.7			4.9			7.2	
Approach LOS		B			C			A			A	

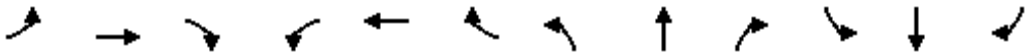
Intersection Summary			
HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	46.9	Sum of lost time (s)	13.0
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	55	3	0	59	0	22	0	4	0	0	3
Future Volume (Veh/h)	5	55	3	0	59	0	22	0	4	0	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	60	3	0	64	0	24	0	4	0	0	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		71										
pX, platoon unblocked												
vC, conflicting volume	64			63			138	136	62	140	137	64
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	64			63			138	136	62	140	137	64
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			97	100	100	100	100	100
cM capacity (veh/h)	1551			1553			801	757	1009	830	755	1006

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	68	64	28	3
Volume Left	5	0	24	0
Volume Right	3	0	4	3
cSH	1551	1553	825	1006
Volume to Capacity	0.00	0.00	0.03	0.00
Queue Length 95th (m)	0.1	0.0	0.8	0.1
Control Delay (s)	0.6	0.0	9.5	8.6
Lane LOS	A		A	A
Approach Delay (s)	0.6	0.0	9.5	8.6
Approach LOS			A	A

Intersection Summary				
Average Delay	2.0			
Intersection Capacity Utilization	22.0%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	17	4	12	26	9	3	63	3	9	66	6
Future Volume (Veh/h)	9	17	4	12	26	9	3	63	3	9	66	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	18	4	13	28	10	3	68	3	10	72	7
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	195	172	76	184	174	70	79			71		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	195	172	76	184	174	70	79			71		
tC, single (s)	7.1	6.6	6.2	7.2	6.5	6.4	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.6	4.0	3.5	2.2			2.2		
p0 queue free %	99	97	100	98	96	99	100			99		
cM capacity (veh/h)	733	704	991	733	716	953	1532			1542		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	32	51	74	89
Volume Left	10	13	3	10
Volume Right	4	10	3	7
cSH	740	758	1532	1542
Volume to Capacity	0.04	0.07	0.00	0.01
Queue Length 95th (m)	1.0	1.6	0.0	0.1
Control Delay (s)	10.1	10.1	0.3	0.9
Lane LOS	B	B	A	A
Approach Delay (s)	10.1	10.1	0.3	0.9
Approach LOS	B	B		

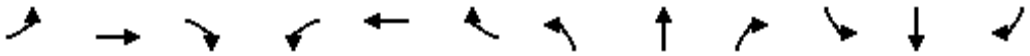
Intersection Summary				
Average Delay	3.8			
Intersection Capacity Utilization	17.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	267	285	130	53	300	67	92	257	78	192	485
v/c Ratio	0.59	0.36	0.17	0.11	0.37	0.10	0.29	0.51	0.27	0.39	0.64
Control Delay	17.7	11.5	2.9	9.9	11.7	3.3	19.7	18.9	19.7	19.6	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	17.7	11.5	2.9	9.9	11.7	3.3	19.7	18.9	19.7	19.6	7.5
Queue Length 50th (m)	15.8	14.9	0.0	2.5	15.9	0.0	6.3	15.7	5.3	13.5	2.3
Queue Length 95th (m)	44.2	37.2	7.5	9.3	39.2	5.5	20.1	42.6	17.9	35.7	25.1
Internal Link Dist (m)		197.3			831.7			297.4		206.2	
Turn Bay Length (m)	160.0		120.0	150.0		115.0	110.0		145.0		85.0
Base Capacity (vph)	761	1345	1203	779	1345	1130	749	1122	678	1164	1164
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	0.35	0.21	0.11	0.07	0.22	0.06	0.12	0.23	0.12	0.16	0.42

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	246	262	120	49	276	62	85	153	84	72	177	446
Future Volume (vph)	246	262	120	49	276	62	85	153	84	72	177	446
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
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)	1755	1883	1633	1772	1883	1555	1825	1807		1755	1902	1617
Flt Permitted	0.58	1.00	1.00	0.59	1.00	1.00	0.64	1.00		0.60	1.00	1.00
Satd. Flow (perm)	1066	1883	1633	1091	1883	1555	1223	1807		1109	1902	1617
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	267	285	130	53	300	67	92	166	91	78	192	485
RTOR Reduction (vph)	0	0	74	0	0	38	0	29	0	0	0	330
Lane Group Flow (vph)	267	285	56	53	300	29	92	228	0	78	192	155
Heavy Vehicles (%)	4%	2%	0%	3%	2%	5%	0%	1%	0%	4%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	21.9	21.9	21.9	21.9	21.9	21.9	13.4	13.4		13.4	13.4	13.4
Effective Green, g (s)	21.9	21.9	21.9	21.9	21.9	21.9	13.4	13.4		13.4	13.4	13.4
Actuated g/C Ratio	0.43	0.43	0.43	0.43	0.43	0.43	0.26	0.26		0.26	0.26	0.26
Clearance Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	461	814	706	472	814	673	323	478		293	503	428
v/s Ratio Prot		0.15			0.16			c0.13			0.10	
v/s Ratio Perm	c0.25		0.03	0.05		0.02	0.08			0.07		0.10
v/c Ratio	0.58	0.35	0.08	0.11	0.37	0.04	0.28	0.48		0.27	0.38	0.36
Uniform Delay, d1	10.9	9.6	8.4	8.6	9.7	8.3	14.8	15.7		14.7	15.2	15.1
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	2.5	0.5	0.1	0.2	0.5	0.0	0.5	0.8		0.5	0.5	0.5
Delay (s)	13.3	10.0	8.5	8.7	10.2	8.3	15.3	16.4		15.2	15.7	15.6
Level of Service	B	B	A	A	B	A	B	B		B	B	B
Approach Delay (s)		11.0			9.7			16.1			15.6	
Approach LOS		B			A			B			B	

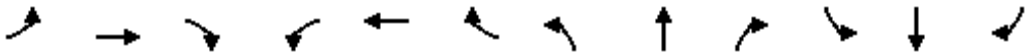
Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	50.6	Sum of lost time (s)	15.3
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	318	6	0	315	35	1	12	3	23	24	48
Future Volume (Veh/h)	27	318	6	0	315	35	1	12	3	23	24	48
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	346	7	0	342	38	1	13	3	25	26	52
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	380			353			811	784	346	756	753	342
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	380			353			811	784	346	756	753	342
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.1	3.4
p0 queue free %	98			100			100	96	100	92	92	92
cM capacity (veh/h)	1162			1217			256	319	702	310	326	685

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	375	7	342	38	17	103
Volume Left	29	0	0	0	1	25
Volume Right	0	7	0	38	3	52
cSH	1162	1700	1217	1700	348	436
Volume to Capacity	0.02	0.00	0.00	0.02	0.05	0.24
Queue Length 95th (m)	0.6	0.0	0.0	0.0	1.2	6.9
Control Delay (s)	0.9	0.0	0.0	0.0	15.9	15.8
Lane LOS	A				C	C
Approach Delay (s)	0.9		0.0		15.9	15.8
Approach LOS					C	C

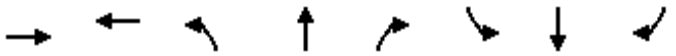
Intersection Summary				
Average Delay	2.5			
Intersection Capacity Utilization	57.0%	ICU Level of Service		B
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	1	6	6	2	1	2	1	14	4	1	0
Future Volume (vph)	0	1	6	6	2	1	2	1	14	4	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1	7	7	2	1	2	1	15	4	1	0

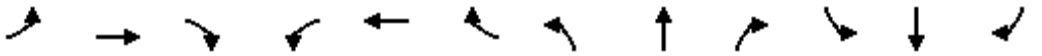
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	8	10	18	5
Volume Left (vph)	0	7	2	4
Volume Right (vph)	7	1	15	0
Hadj (s)	0.18	0.64	-0.29	1.86
Departure Headway (s)	4.1	4.6	3.7	5.8
Degree Utilization, x	0.01	0.01	0.02	0.01
Capacity (veh/h)	858	774	975	604
Control Delay (s)	7.2	7.7	6.7	8.9
Approach Delay (s)	7.2	7.7	6.7	8.9
Approach LOS	A	A	A	A

Intersection Summary				
Delay	7.3			
Level of Service	A			
Intersection Capacity Utilization	15.5%	ICU Level of Service	A	
Analysis Period (min)	15			



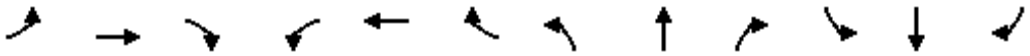
Lane Group	EBT	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	16	88	1	565	47	32	341	9
v/c Ratio	0.05	0.23	0.00	0.43	0.05	0.07	0.27	0.01
Control Delay	15.3	13.1	6.0	8.0	2.5	6.6	6.5	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.3	13.1	6.0	8.0	2.5	6.6	6.5	0.1
Queue Length 50th (m)	0.8	3.2	0.0	29.3	0.0	1.2	15.1	0.0
Queue Length 95th (m)	5.0	14.4	0.6	56.6	3.3	4.6	30.3	0.2
Internal Link Dist (m)	330.5	47.0		782.7			84.7	
Turn Bay Length (m)			113.0		180.0	50.0		15.0
Base Capacity (vph)	762	846	1016	1757	1265	613	1724	1127
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	0.02	0.10	0.00	0.32	0.04	0.05	0.20	0.01

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	1	3	46	3	32	1	520	43	29	314	8
Future Volume (vph)	11	1	3	46	3	32	1	520	43	29	314	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.97			0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96			0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1427			1403		1825	1847	1328	1437	1812	1183
Flt Permitted		0.72			0.82		0.56	1.00	1.00	0.43	1.00	1.00
Satd. Flow (perm)		1071			1177		1068	1847	1328	645	1812	1183
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	1	3	50	3	35	1	565	47	32	341	9
RTOR Reduction (vph)	0	3	0	0	31	0	0	0	21	0	0	4
Lane Group Flow (vph)	0	13	0	0	57	0	1	565	26	32	341	5
Heavy Vehicles (%)	27%	0%	33%	24%	0%	31%	0%	4%	23%	27%	6%	38%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		5.1			5.1		22.5	22.5	22.5	22.5	22.5	22.5
Effective Green, g (s)		5.1			5.1		22.5	22.5	22.5	22.5	22.5	22.5
Actuated g/C Ratio		0.13			0.13		0.55	0.55	0.55	0.55	0.55	0.55
Clearance Time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Grp Cap (vph)		134			147		591	1023	735	357	1004	655
v/s Ratio Prot								c0.31			0.19	
v/s Ratio Perm		0.01			c0.05		0.00		0.02	0.05		0.00
v/c Ratio		0.10			0.39		0.00	0.55	0.04	0.09	0.34	0.01
Uniform Delay, d1		15.7			16.3		4.0	5.8	4.1	4.2	5.0	4.1
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.3			1.7		0.0	1.0	0.0	0.2	0.3	0.0
Delay (s)		16.0			18.0		4.0	6.8	4.1	4.4	5.3	4.1
Level of Service		B			B		A	A	A	A	A	A
Approach Delay (s)		16.0			18.0			6.6			5.2	
Approach LOS		B			B			A			A	

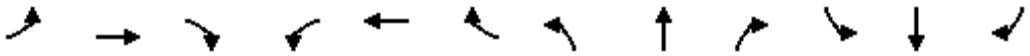
Intersection Summary			
HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	40.6	Sum of lost time (s)	13.0
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	27	42	0	42	2	35	0	0	0	0	3
Future Volume (Veh/h)	1	27	42	0	42	2	35	0	0	0	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	29	46	0	46	2	38	0	0	0	0	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		71										
pX, platoon unblocked												
vC, conflicting volume	48			75			104	102	52	101	124	47
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	48			75			104	102	52	101	124	47
tC, single (s)	4.1			4.1			8.1	6.5	6.2	7.1	6.5	6.5
tC, 2 stage (s)												
tF (s)	2.2			2.2			4.4	4.0	3.3	3.5	4.0	3.6
p0 queue free %	100			100			94	100	100	100	100	100
cM capacity (veh/h)	1572			1537			687	791	1021	884	770	941

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	76	48	38	3
Volume Left	1	0	38	0
Volume Right	46	2	0	3
cSH	1572	1537	687	941
Volume to Capacity	0.00	0.00	0.06	0.00
Queue Length 95th (m)	0.0	0.0	1.3	0.1
Control Delay (s)	0.1	0.0	10.5	8.8
Lane LOS	A		B	A
Approach Delay (s)	0.1	0.0	10.5	8.8
Approach LOS			B	A

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	20.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	22	0	5	19	7	4	46	21	25	33	0
Future Volume (Veh/h)	2	22	0	5	19	7	4	46	21	25	33	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	24	0	5	21	8	4	50	23	27	36	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)												
pX, platoon unblocked												
vC, conflicting volume	178	171	36	172	160	62	36			73		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	178	171	36	172	160	62	36			73		
tC, single (s)	7.1	6.6	6.2	7.8	6.7	6.2	4.4			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	4.2	4.2	3.3	2.5			2.2		
p0 queue free %	100	97	100	99	97	99	100			98		
cM capacity (veh/h)	752	700	1042	627	687	1009	1397			1508		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	26	34	77	63
Volume Left	2	5	4	27
Volume Right	0	8	23	0
cSH	704	731	1397	1508
Volume to Capacity	0.04	0.05	0.00	0.02
Queue Length 95th (m)	0.9	1.1	0.1	0.4
Control Delay (s)	10.3	10.2	0.4	3.3
Lane LOS	B	B	A	A
Approach Delay (s)	10.3	10.2	0.4	3.3
Approach LOS	B	B		

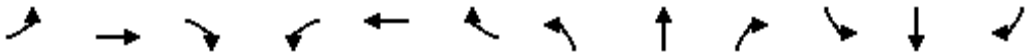
Intersection Summary				
Average Delay	4.3			
Intersection Capacity Utilization	19.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	258	142	41	72	263	85	83	265	28	113	246
v/c Ratio	0.59	0.19	0.06	0.14	0.37	0.12	0.24	0.53	0.10	0.24	0.42
Control Delay	18.1	10.4	2.3	10.2	12.0	3.2	17.8	19.4	16.7	17.0	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
Total Delay	18.1	10.4	2.3	10.2	12.0	3.2	17.8	19.4	16.7	17.0	5.4
Queue Length 50th (m)	15.3	6.9	0.0	3.4	13.9	0.0	5.2	16.1	1.7	7.0	0.0
Queue Length 95th (m)	41.4	19.0	2.9	11.3	34.0	6.1	17.7	44.3	8.0	21.7	14.2
Internal Link Dist (m)		197.3			831.7			297.4		206.2	
Turn Bay Length (m)	160.0		120.0	150.0		115.0	110.0		145.0		85.0
Base Capacity (vph)	780	1308	1106	922	1283	1165	811	1151	632	1131	1043
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.11	0.04	0.08	0.20	0.07	0.10	0.23	0.04	0.10	0.24

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	237	131	38	66	242	78	76	182	62	26	104	226
Future Volume (vph)	237	131	38	66	242	78	76	182	62	26	104	226
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
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)	1690	1779	1484	1789	1746	1555	1789	1812		1601	1795	1512
Flt Permitted	0.60	1.00	1.00	0.67	1.00	1.00	0.68	1.00		0.60	1.00	1.00
Satd. Flow (perm)	1062	1779	1484	1255	1746	1555	1289	1812		1004	1795	1512
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	258	142	41	72	263	85	83	198	67	28	113	246
RTOR Reduction (vph)	0	0	24	0	0	50	0	17	0	0	0	179
Lane Group Flow (vph)	258	142	17	72	263	35	83	248	0	28	113	67
Heavy Vehicles (%)	8%	8%	10%	2%	10%	5%	2%	2%	2%	14%	7%	8%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	20.4	20.4	20.4	20.4	20.4	20.4	13.3	13.3		13.3	13.3	13.3
Effective Green, g (s)	20.4	20.4	20.4	20.4	20.4	20.4	13.3	13.3		13.3	13.3	13.3
Actuated g/C Ratio	0.42	0.42	0.42	0.42	0.42	0.42	0.27	0.27		0.27	0.27	0.27
Clearance Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	442	740	617	522	726	647	349	491		272	487	410
v/s Ratio Prot		0.08			0.15			c0.14			0.06	
v/s Ratio Perm	c0.24		0.01	0.06		0.02	0.06			0.03		0.04
v/c Ratio	0.58	0.19	0.03	0.14	0.36	0.05	0.24	0.50		0.10	0.23	0.16
Uniform Delay, d1	11.0	9.1	8.4	8.9	9.8	8.5	13.9	15.1		13.4	13.9	13.6
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	2.7	0.2	0.0	0.2	0.5	0.1	0.4	0.8		0.2	0.2	0.2
Delay (s)	13.7	9.3	8.5	9.1	10.4	8.6	14.3	15.9		13.5	14.1	13.8
Level of Service	B	A	A	A	B	A	B	B		B	B	B
Approach Delay (s)		11.8			9.8			15.5			13.9	
Approach LOS		B			A			B			B	

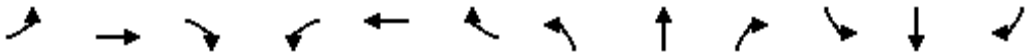
Intersection Summary			
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	49.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	175	0	0	301	15	5	12	0	19	6	25
Future Volume (Veh/h)	16	175	0	0	301	15	5	12	0	19	6	25
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	190	0	0	327	16	5	13	0	21	7	27
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	343			190			582	567	190	558	551	327
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	343			190			582	567	190	558	551	327
tC, single (s)	4.4			4.1			7.1	6.5	6.2	7.2	6.5	6.5
tC, 2 stage (s)												
tF (s)	2.5			2.2			3.5	4.0	3.3	3.6	4.0	3.5
p0 queue free %	98			100			99	97	100	95	98	96
cM capacity (veh/h)	1071			1396			400	429	857	418	438	664

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	207	0	327	16	18	55
Volume Left	17	0	0	0	5	21
Volume Right	0	0	0	16	0	27
cSH	1071	1700	1396	1700	421	515
Volume to Capacity	0.02	0.00	0.00	0.01	0.04	0.11
Queue Length 95th (m)	0.4	0.0	0.0	0.0	1.0	2.7
Control Delay (s)	0.8	0.0	0.0	0.0	13.9	12.8
Lane LOS	A				B	B
Approach Delay (s)	0.8		0.0		13.9	12.8
Approach LOS					B	B

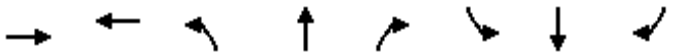
Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	33.4%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	0	0	13	0	1	0	0	18	3	1	0
Future Volume (vph)	0	0	0	13	0	1	0	0	18	3	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	14	0	1	0	0	20	3	1	0

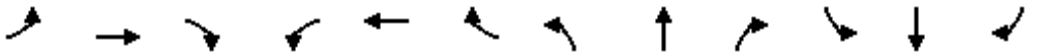
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	0	15	20	4
Volume Left (vph)	0	14	0	3
Volume Right (vph)	0	1	20	0
Hadj (s)	0.00	0.15	-0.60	0.15
Departure Headway (s)	4.0	4.1	3.3	4.1
Degree Utilization, x	0.00	0.02	0.02	0.00
Capacity (veh/h)	900	870	1070	869
Control Delay (s)	7.0	7.2	6.4	7.1
Approach Delay (s)	0.0	7.2	6.4	7.1
Approach LOS	A	A	A	A

Intersection Summary				
Delay	6.8			
Level of Service	A			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A	
Analysis Period (min)	15			



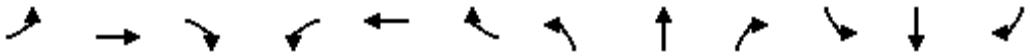
Lane Group	EBT	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	20	71	2	407	49	8	651	10
v/c Ratio	0.05	0.17	0.01	0.30	0.04	0.01	0.47	0.01
Control Delay	17.6	15.6	5.5	6.2	2.1	5.4	7.9	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.6	15.6	5.5	6.2	2.1	5.4	7.9	0.2
Queue Length 50th (m)	1.2	3.5	0.1	18.7	0.0	0.3	35.5	0.0
Queue Length 95th (m)	6.4	14.3	0.7	34.0	3.1	1.6	63.6	0.3
Internal Link Dist (m)	330.5	47.0		782.7			84.7	
Turn Bay Length (m)			113.0		180.0	50.0		15.0
Base Capacity (vph)	977	971	434	1761	1444	803	1779	1378
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	0.02	0.07	0.00	0.23	0.03	0.01	0.37	0.01

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	2	1	46	5	15	2	374	45	7	599	9
Future Volume (vph)	16	2	1	46	5	15	2	374	45	7	599	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.99			0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96			0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1830			1733		1217	1883	1541	1560	1902	1471
Flt Permitted		0.74			0.78		0.36	1.00	1.00	0.52	1.00	1.00
Satd. Flow (perm)		1412			1396		464	1883	1541	859	1902	1471
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	2	1	50	5	16	2	407	49	8	651	10
RTOR Reduction (vph)	0	1	0	0	14	0	0	0	21	0	0	4
Lane Group Flow (vph)	0	19	0	0	57	0	2	407	28	8	651	6
Heavy Vehicles (%)	0%	0%	0%	0%	0%	17%	50%	2%	6%	17%	1%	11%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		5.0			5.0		24.2	24.2	24.2	24.2	24.2	24.2
Effective Green, g (s)		5.0			5.0		24.2	24.2	24.2	24.2	24.2	24.2
Actuated g/C Ratio		0.12			0.12		0.57	0.57	0.57	0.57	0.57	0.57
Clearance Time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Grp Cap (vph)		167			165		266	1079	883	492	1090	843
v/s Ratio Prot								0.22			c0.34	
v/s Ratio Perm		0.01			c0.04		0.00		0.02	0.01		0.00
v/c Ratio		0.11			0.34		0.01	0.38	0.03	0.02	0.60	0.01
Uniform Delay, d1		16.6			17.1		3.9	4.9	3.9	3.9	5.8	3.9
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.3			1.3		0.0	0.4	0.0	0.0	1.2	0.0
Delay (s)		16.9			18.4		3.9	5.3	3.9	3.9	7.0	3.9
Level of Service		B			B		A	A	A	A	A	A
Approach Delay (s)		16.9			18.4			5.1			6.9	
Approach LOS		B			B			A			A	

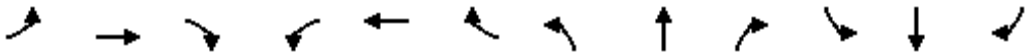
Intersection Summary			
HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	42.2	Sum of lost time (s)	13.0
Intersection Capacity Utilization	50.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	47	3	0	51	0	22	0	4	0	0	3
Future Volume (Veh/h)	5	47	3	0	51	0	22	0	4	0	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	51	3	0	55	0	24	0	4	0	0	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		71										
pX, platoon unblocked												
vC, conflicting volume	55			54			120	118	52	122	119	55
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	55			54			120	118	52	122	119	55
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			97	100	100	100	100	100
cM capacity (veh/h)	1563			1564			823	774	1021	853	773	1018

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	59	55	28	3
Volume Left	5	0	24	0
Volume Right	3	0	4	3
cSH	1563	1564	846	1018
Volume to Capacity	0.00	0.00	0.03	0.00
Queue Length 95th (m)	0.1	0.0	0.8	0.1
Control Delay (s)	0.6	0.0	9.4	8.5
Lane LOS	A		A	A
Approach Delay (s)	0.6	0.0	9.4	8.5
Approach LOS			A	A

Intersection Summary				
Average Delay	2.3			
Intersection Capacity Utilization	21.6%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	15	4	10	22	7	2	55	2	7	57	5
Future Volume (Veh/h)	7	15	4	10	22	7	2	55	2	7	57	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	16	4	11	24	8	2	60	2	8	62	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	166	146	64	158	148	61	67			62		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	166	146	64	158	148	61	67			62		
tC, single (s)	7.1	6.6	6.2	7.2	6.5	6.4	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.6	4.0	3.5	2.2			2.2		
p0 queue free %	99	98	100	99	97	99	100			99		
cM capacity (veh/h)	773	729	1005	766	742	964	1547			1554		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	28	43	64	75
Volume Left	8	11	2	8
Volume Right	4	8	2	5
cSH	772	782	1547	1554
Volume to Capacity	0.04	0.05	0.00	0.01
Queue Length 95th (m)	0.9	1.3	0.0	0.1
Control Delay (s)	9.8	9.9	0.2	0.8
Lane LOS	A	A	A	A
Approach Delay (s)	9.8	9.9	0.2	0.8
Approach LOS	A	A		

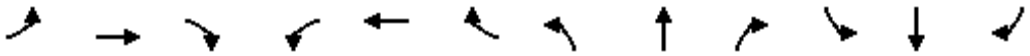
Intersection Summary				
Average Delay	3.7			
Intersection Capacity Utilization	16.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	230	246	112	46	259	58	79	220	67	166	417
v/c Ratio	0.51	0.32	0.15	0.10	0.34	0.09	0.25	0.45	0.23	0.34	0.58
Control Delay	15.2	10.8	2.9	9.4	11.0	3.3	17.6	16.2	17.6	17.7	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	15.2	10.8	2.9	9.4	11.0	3.3	17.6	16.2	17.6	17.7	5.9
Queue Length 50th (m)	12.0	11.7	0.0	2.0	12.4	0.0	4.6	11.0	3.9	9.9	0.0
Queue Length 95th (m)	32.5	28.6	6.6	7.4	30.1	4.7	16.4	33.3	14.6	28.7	17.6
Internal Link Dist (m)		197.3			831.7			297.4		206.2	
Turn Bay Length (m)	160.0		120.0	150.0		115.0	110.0		145.0		85.0
Base Capacity (vph)	848	1444	1278	866	1444	1206	823	1202	754	1250	1206
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	0.27	0.17	0.09	0.05	0.18	0.05	0.10	0.18	0.09	0.13	0.35

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	212	226	103	42	238	53	73	131	72	62	153	384
Future Volume (vph)	212	226	103	42	238	53	73	131	72	62	153	384
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
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)	1755	1883	1633	1772	1883	1555	1825	1807		1755	1902	1617
Flt Permitted	0.60	1.00	1.00	0.61	1.00	1.00	0.65	1.00		0.62	1.00	1.00
Satd. Flow (perm)	1107	1883	1633	1131	1883	1555	1253	1807		1147	1902	1617
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	230	246	112	46	259	58	79	142	78	67	166	417
RTOR Reduction (vph)	0	0	66	0	0	34	0	29	0	0	0	309
Lane Group Flow (vph)	230	246	46	46	259	24	79	191	0	67	166	108
Heavy Vehicles (%)	4%	2%	0%	3%	2%	5%	0%	1%	0%	4%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	19.2	19.2	19.2	19.2	19.2	19.2	12.0	12.0		12.0	12.0	12.0
Effective Green, g (s)	19.2	19.2	19.2	19.2	19.2	19.2	12.0	12.0		12.0	12.0	12.0
Actuated g/C Ratio	0.41	0.41	0.41	0.41	0.41	0.41	0.26	0.26		0.26	0.26	0.26
Clearance Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	457	777	674	466	777	642	323	466		296	490	417
v/s Ratio Prot		0.13			0.14			c0.11			0.09	
v/s Ratio Perm	c0.21		0.03	0.04		0.02	0.06			0.06		0.07
v/c Ratio	0.50	0.32	0.07	0.10	0.33	0.04	0.24	0.41		0.23	0.34	0.26
Uniform Delay, d1	10.1	9.2	8.2	8.4	9.3	8.1	13.7	14.3		13.6	14.0	13.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.5	0.4	0.1	0.2	0.4	0.0	0.4	0.6		0.4	0.4	0.3
Delay (s)	11.6	9.6	8.3	8.5	9.7	8.2	14.1	14.9		14.0	14.4	14.0
Level of Service	B	A	A	A	A	A	B	B		B	B	B
Approach Delay (s)		10.2			9.3			14.7			14.1	
Approach LOS		B			A			B			B	

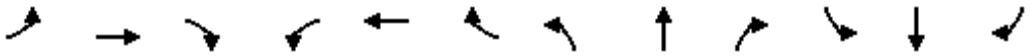
Intersection Summary			
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	46.5	Sum of lost time (s)	15.3
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	274	5	0	272	30	1	10	2	20	21	41
Future Volume (Veh/h)	24	274	5	0	272	30	1	10	2	20	21	41
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	298	5	0	296	33	1	11	2	22	23	45
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	329			303			702	679	298	654	651	296
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	329			303			702	679	298	654	651	296
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.1	3.4
p0 queue free %	98			100			100	97	100	94	94	94
cM capacity (veh/h)	1214			1269			312	368	746	367	374	727

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	324	5	296	33	14	90
Volume Left	26	0	0	0	1	22
Volume Right	0	5	0	33	2	45
cSH	1214	1700	1269	1700	391	491
Volume to Capacity	0.02	0.00	0.00	0.02	0.04	0.18
Queue Length 95th (m)	0.5	0.0	0.0	0.0	0.8	5.0
Control Delay (s)	0.8	0.0	0.0	0.0	14.5	14.0
Lane LOS	A				B	B
Approach Delay (s)	0.8		0.0		14.5	14.0
Approach LOS					B	B

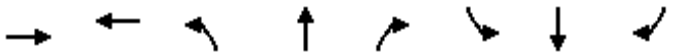
Intersection Summary				
Average Delay	2.3			
Intersection Capacity Utilization	50.2%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	1	6	6	2	1	2	1	14	4	1	0
Future Volume (vph)	0	1	6	6	2	1	2	1	14	4	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1	7	7	2	1	2	1	15	4	1	0

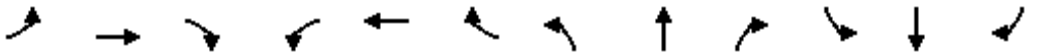
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	8	10	18	5
Volume Left (vph)	0	7	2	4
Volume Right (vph)	7	1	15	0
Hadj (s)	0.18	0.64	-0.29	1.86
Departure Headway (s)	4.1	4.6	3.7	5.8
Degree Utilization, x	0.01	0.01	0.02	0.01
Capacity (veh/h)	858	774	975	604
Control Delay (s)	7.2	7.7	6.7	8.9
Approach Delay (s)	7.2	7.7	6.7	8.9
Approach LOS	A	A	A	A

Intersection Summary				
Delay	7.3			
Level of Service	A			
Intersection Capacity Utilization	15.5%	ICU Level of Service	A	
Analysis Period (min)	15			



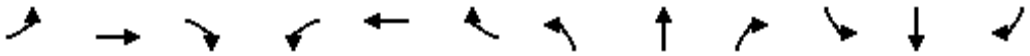
Lane Group	EBT	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	16	58	1	625	51	32	368	9
v/c Ratio	0.05	0.16	0.00	0.47	0.05	0.08	0.28	0.01
Control Delay	16.5	14.8	5.0	7.9	2.1	6.2	6.2	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.5	14.8	5.0	7.9	2.1	6.2	6.2	0.0
Queue Length 50th (m)	0.8	2.6	0.0	34.0	0.0	1.2	16.6	0.0
Queue Length 95th (m)	5.3	11.9	0.5	60.9	3.2	4.4	30.6	0.2
Internal Link Dist (m)	330.5	47.0		782.7			84.7	
Turn Bay Length (m)			113.0		180.0	50.0		15.0
Base Capacity (vph)	769	827	977	1735	1250	543	1702	1113
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	0.02	0.07	0.00	0.36	0.04	0.06	0.22	0.01

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	1	3	34	3	17	1	575	47	29	339	8
Future Volume (vph)	11	1	3	34	3	17	1	575	47	29	339	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.97			0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96			0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1427			1428		1825	1847	1328	1437	1812	1183
Flt Permitted		0.74			0.80		0.54	1.00	1.00	0.38	1.00	1.00
Satd. Flow (perm)		1099			1174		1042	1847	1328	578	1812	1183
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	1	3	37	3	18	1	625	51	32	368	9
RTOR Reduction (vph)	0	3	0	0	16	0	0	0	22	0	0	4
Lane Group Flow (vph)	0	13	0	0	42	0	1	625	29	32	368	5
Heavy Vehicles (%)	27%	0%	33%	24%	0%	31%	0%	4%	23%	27%	6%	38%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		4.8			4.8		23.2	23.2	23.2	23.2	23.2	23.2
Effective Green, g (s)		4.8			4.8		23.2	23.2	23.2	23.2	23.2	23.2
Actuated g/C Ratio		0.12			0.12		0.57	0.57	0.57	0.57	0.57	0.57
Clearance Time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Grp Cap (vph)		128			137		589	1045	751	327	1025	669
v/s Ratio Prot								c0.34			0.20	
v/s Ratio Perm		0.01			c0.04		0.00		0.02	0.06		0.00
v/c Ratio		0.10			0.31		0.00	0.60	0.04	0.10	0.36	0.01
Uniform Delay, d1		16.2			16.6		3.9	5.8	3.9	4.1	4.8	3.9
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.4			1.3		0.0	1.2	0.0	0.2	0.4	0.0
Delay (s)		16.5			17.9		3.9	7.1	4.0	4.3	5.2	3.9
Level of Service		B			B		A	A	A	A	A	A
Approach Delay (s)		16.5			17.9			6.8			5.1	
Approach LOS		B			B			A			A	

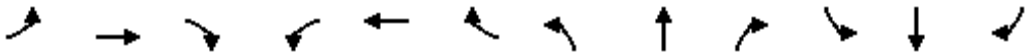
Intersection Summary			
HCM 2000 Control Delay	6.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	41.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	29	42	0	46	2	4	0	0	0	0	3
Future Volume (Veh/h)	1	29	42	0	46	2	4	0	0	0	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	32	46	0	50	2	4	0	0	0	0	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		71										
pX, platoon unblocked												
vC, conflicting volume	52			78			111	109	55	108	131	51
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	52			78			111	109	55	108	131	51
tC, single (s)	4.1			4.1			8.1	6.5	6.2	7.1	6.5	6.5
tC, 2 stage (s)												
tF (s)	2.2			2.2			4.4	4.0	3.3	3.5	4.0	3.6
p0 queue free %	100			100			99	100	100	100	100	100
cM capacity (veh/h)	1567			1533			679	784	1018	875	763	936

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	79	52	4	3
Volume Left	1	0	4	0
Volume Right	46	2	0	3
cSH	1567	1533	679	936
Volume to Capacity	0.00	0.00	0.01	0.00
Queue Length 95th (m)	0.0	0.0	0.1	0.1
Control Delay (s)	0.1	0.0	10.3	8.9
Lane LOS	A		B	A
Approach Delay (s)	0.1	0.0	10.3	8.9
Approach LOS			B	A

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	15.0%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	24	0	5	20	8	4	50	23	27	36	0
Future Volume (Veh/h)	3	24	0	5	20	8	4	50	23	27	36	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	26	0	5	22	9	4	54	25	29	39	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)												
pX, platoon unblocked												
vC, conflicting volume	192	184	39	184	172	66	39			79		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	192	184	39	184	172	66	39			79		
tC, single (s)	7.1	6.6	6.2	7.8	6.7	6.2	4.4			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	4.2	4.2	3.3	2.5			2.2		
p0 queue free %	100	96	100	99	97	99	100			98		
cM capacity (veh/h)	734	688	1038	612	675	1003	1393			1500		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	29	36	83	68
Volume Left	3	5	4	29
Volume Right	0	9	25	0
cSH	692	724	1393	1500
Volume to Capacity	0.04	0.05	0.00	0.02
Queue Length 95th (m)	1.0	1.2	0.1	0.4
Control Delay (s)	10.4	10.2	0.4	3.3
Lane LOS	B	B	A	A
Approach Delay (s)	10.4	10.2	0.4	3.3
Approach LOS	B	B		

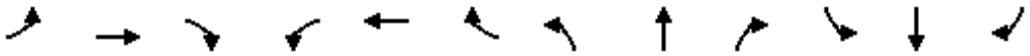
Intersection Summary				
Average Delay	4.3			
Intersection Capacity Utilization	20.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	276	154	46	77	299	110	89	287	30	123	248
v/c Ratio	0.64	0.21	0.07	0.15	0.41	0.15	0.26	0.56	0.11	0.25	0.42
Control Delay	20.1	10.7	2.7	10.5	12.7	3.0	18.9	21.0	17.7	18.0	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
Total Delay	20.1	10.7	2.7	10.5	12.7	3.0	18.9	21.0	17.7	18.0	5.4
Queue Length 50th (m)	17.9	8.0	0.0	3.9	17.1	0.0	6.0	19.3	2.0	8.3	0.0
Queue Length 95th (m)	47.5	21.0	3.7	12.3	40.1	7.0	19.3	50.3	8.7	24.3	14.5
Internal Link Dist (m)		197.3			831.7			297.4		206.2	
Turn Bay Length (m)	160.0		120.0	150.0		115.0	110.0		145.0		85.0
Base Capacity (vph)	723	1252	1062	873	1229	1127	770	1103	593	1083	1010
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.12	0.04	0.09	0.24	0.10	0.12	0.26	0.05	0.11	0.25

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	254	142	42	71	275	101	82	197	67	28	113	228
Future Volume (vph)	254	142	42	71	275	101	82	197	67	28	113	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
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)	1690	1779	1484	1789	1746	1555	1789	1812		1601	1795	1512
Flt Permitted	0.58	1.00	1.00	0.66	1.00	1.00	0.68	1.00		0.58	1.00	1.00
Satd. Flow (perm)	1027	1779	1484	1242	1746	1555	1277	1812		984	1795	1512
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	276	154	46	77	299	110	89	214	73	30	123	248
RTOR Reduction (vph)	0	0	26	0	0	63	0	17	0	0	0	180
Lane Group Flow (vph)	276	154	20	77	299	47	89	270	0	30	123	68
Heavy Vehicles (%)	8%	8%	10%	2%	10%	5%	2%	2%	2%	14%	7%	8%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	22.0	22.0	22.0	22.0	22.0	22.0	14.2	14.2		14.2	14.2	14.2
Effective Green, g (s)	22.0	22.0	22.0	22.0	22.0	22.0	14.2	14.2		14.2	14.2	14.2
Actuated g/C Ratio	0.43	0.43	0.43	0.43	0.43	0.43	0.28	0.28		0.28	0.28	0.28
Clearance Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	438	759	633	530	745	664	352	499		271	494	416
v/s Ratio Prot		0.09			0.17			c0.15			0.07	
v/s Ratio Perm	c0.27		0.01	0.06		0.03	0.07			0.03		0.05
v/c Ratio	0.63	0.20	0.03	0.15	0.40	0.07	0.25	0.54		0.11	0.25	0.16
Uniform Delay, d1	11.6	9.3	8.6	9.0	10.2	8.7	14.5	15.9		13.9	14.5	14.1
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	3.7	0.2	0.0	0.2	0.6	0.1	0.4	1.2		0.2	0.3	0.2
Delay (s)	15.2	9.5	8.6	9.2	10.8	8.8	14.9	17.1		14.1	14.8	14.3
Level of Service	B	A	A	A	B	A	B	B		B	B	B
Approach Delay (s)		12.7			10.1			16.6			14.5	
Approach LOS		B			B			B			B	

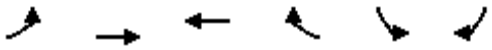
Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	51.5	Sum of lost time (s)	15.3
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	192	0	0	329	16	5	13	0	20	7	27
Future Volume (Veh/h)	17	192	0	0	329	16	5	13	0	20	7	27
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	209	0	0	358	17	5	14	0	22	8	29
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	375			209			636	620	209	610	603	358
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	375			209			636	620	209	610	603	358
tC, single (s)	4.4			4.1			7.1	6.5	6.2	7.2	6.5	6.5
tC, 2 stage (s)												
tF (s)	2.5			2.2			3.5	4.0	3.3	3.6	4.0	3.5
p0 queue free %	98			100			99	96	100	94	98	95
cM capacity (veh/h)	1041			1374			365	400	836	384	409	637

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	227	0	358	17	19	59
Volume Left	18	0	0	0	5	22
Volume Right	0	0	0	17	0	29
cSH	1041	1700	1374	1700	390	482
Volume to Capacity	0.02	0.00	0.00	0.01	0.05	0.12
Queue Length 95th (m)	0.4	0.0	0.0	0.0	1.2	3.2
Control Delay (s)	0.8	0.0	0.0	0.0	14.7	13.5
Lane LOS	A				B	B
Approach Delay (s)	0.8		0.0		14.7	13.5
Approach LOS					B	B

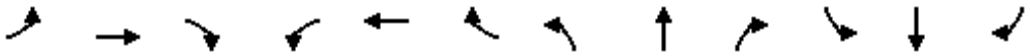
Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	35.5%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	237	420	0	3	28
Future Volume (Veh/h)	0	237	420	0	3	28
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	258	457	0	3	30
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	457				715	457
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	457				715	457
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	95
cM capacity (veh/h)	1114				400	608

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	258	457	33
Volume Left	0	0	3
Volume Right	0	0	30
cSH	1114	1700	580
Volume to Capacity	0.00	0.27	0.06
Queue Length 95th (m)	0.0	0.0	1.4
Control Delay (s)	0.0	0.0	11.6
Lane LOS			B
Approach Delay (s)	0.0	0.0	11.6
Approach LOS			B

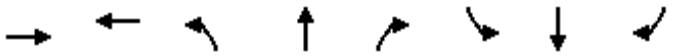
Intersection Summary			
Average Delay		0.5	
Intersection Capacity Utilization		32.1%	ICU Level of Service A
Analysis Period (min)		15	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	0	0	13	0	1	0	0	18	3	1	0
Future Volume (vph)	0	0	0	13	0	1	0	0	18	3	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	14	0	1	0	0	20	3	1	0

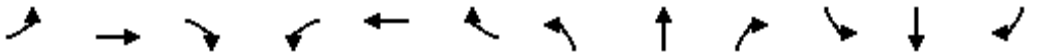
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	0	15	20	4
Volume Left (vph)	0	14	0	3
Volume Right (vph)	0	1	20	0
Hadj (s)	0.00	0.15	-0.60	0.15
Departure Headway (s)	4.0	4.1	3.3	4.1
Degree Utilization, x	0.00	0.02	0.02	0.00
Capacity (veh/h)	900	870	1070	869
Control Delay (s)	7.0	7.2	6.4	7.1
Approach Delay (s)	0.0	7.2	6.4	7.1
Approach LOS	A	A	A	A

Intersection Summary				
Delay	6.8			
Level of Service	A			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A	
Analysis Period (min)	15			



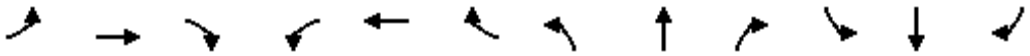
Lane Group	EBT	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	20	76	2	440	52	9	703	10
v/c Ratio	0.05	0.19	0.01	0.32	0.05	0.01	0.50	0.01
Control Delay	19.3	17.1	5.0	6.0	2.0	5.2	7.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.3	17.1	5.0	6.0	2.0	5.2	7.9	0.1
Queue Length 50th (m)	1.3	4.2	0.1	20.7	0.0	0.3	40.0	0.0
Queue Length 95th (m)	6.8	16.1	0.7	37.5	3.1	1.7	71.6	0.3
Internal Link Dist (m)	330.5	47.0		782.7			84.7	
Turn Bay Length (m)			113.0		180.0	50.0		15.0
Base Capacity (vph)	928	922	381	1698	1394	750	1715	1330
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	0.02	0.08	0.01	0.26	0.04	0.01	0.41	0.01

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	2	1	50	5	16	2	405	48	8	647	9
Future Volume (vph)	16	2	1	50	5	16	2	405	48	8	647	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.99			0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96			0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1830			1733		1217	1883	1541	1560	1902	1471
Flt Permitted		0.74			0.78		0.33	1.00	1.00	0.51	1.00	1.00
Satd. Flow (perm)		1412			1394		423	1883	1541	833	1902	1471
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	2	1	54	5	17	2	440	52	9	703	10
RTOR Reduction (vph)	0	1	0	0	15	0	0	0	21	0	0	4
Lane Group Flow (vph)	0	19	0	0	61	0	2	440	31	9	703	6
Heavy Vehicles (%)	0%	0%	0%	0%	0%	17%	50%	2%	6%	17%	1%	11%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		5.0			5.0		26.7	26.7	26.7	26.7	26.7	26.7
Effective Green, g (s)		5.0			5.0		26.7	26.7	26.7	26.7	26.7	26.7
Actuated g/C Ratio		0.11			0.11		0.60	0.60	0.60	0.60	0.60	0.60
Clearance Time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Grp Cap (vph)		157			155		252	1124	920	497	1136	878
v/s Ratio Prot								0.23			c0.37	
v/s Ratio Perm		0.01			c0.04		0.00		0.02	0.01		0.00
v/c Ratio		0.12			0.39		0.01	0.39	0.03	0.02	0.62	0.01
Uniform Delay, d1		17.9			18.4		3.6	4.7	3.7	3.7	5.7	3.6
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.3			1.6		0.0	0.4	0.0	0.0	1.3	0.0
Delay (s)		18.2			20.1		3.7	5.1	3.7	3.7	7.1	3.6
Level of Service		B			C		A	A	A	A	A	A
Approach Delay (s)		18.2			20.1			5.0			7.0	
Approach LOS		B			C			A			A	

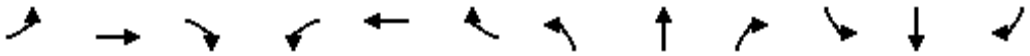
Intersection Summary			
HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	44.7	Sum of lost time (s)	13.0
Intersection Capacity Utilization	53.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	51	3	0	55	0	22	0	4	0	0	3
Future Volume (Veh/h)	5	51	3	0	55	0	22	0	4	0	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	55	3	0	60	0	24	0	4	0	0	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		71										
pX, platoon unblocked												
vC, conflicting volume	60			58			130	126	56	130	128	60
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	60			58			130	126	56	130	128	60
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			97	100	100	100	100	100
cM capacity (veh/h)	1556			1559			812	765	1016	841	764	1011

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	63	60	28	3
Volume Left	5	0	24	0
Volume Right	3	0	4	3
cSH	1556	1559	836	1011
Volume to Capacity	0.00	0.00	0.03	0.00
Queue Length 95th (m)	0.1	0.0	0.8	0.1
Control Delay (s)	0.6	0.0	9.5	8.6
Lane LOS	A		A	A
Approach Delay (s)	0.6	0.0	9.5	8.6
Approach LOS			A	A

Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	21.8%	ICU Level of Service	A	
Analysis Period (min)	15			



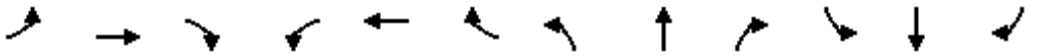
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	16	4	11	24	8	3	59	3	8	62	5
Future Volume (Veh/h)	8	16	4	11	24	8	3	59	3	8	62	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	17	4	12	26	9	3	64	3	9	67	5
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	181	160	70	172	162	66	72			67		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	181	160	70	172	162	66	72			67		
tC, single (s)	7.1	6.6	6.2	7.2	6.5	6.4	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.6	4.0	3.5	2.2			2.2		
p0 queue free %	99	98	100	98	96	99	100			99		
cM capacity (veh/h)	752	715	999	749	729	958	1541			1547		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	30	47	70	81
Volume Left	9	12	3	9
Volume Right	4	9	3	5
cSH	755	769	1541	1547
Volume to Capacity	0.04	0.06	0.00	0.01
Queue Length 95th (m)	0.9	1.5	0.0	0.1
Control Delay (s)	10.0	10.0	0.3	0.9
Lane LOS	A	A	A	A
Approach Delay (s)	10.0	10.0	0.3	0.9
Approach LOS	A	A		

Intersection Summary				
Average Delay	3.8			
Intersection Capacity Utilization	16.6%	ICU Level of Service	A	
Analysis Period (min)	15			

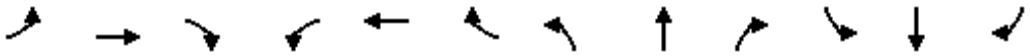
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	249	265	121	50	279	63	86	239	73	179	451
v/c Ratio	0.55	0.34	0.16	0.11	0.35	0.09	0.27	0.49	0.25	0.37	0.60
Control Delay	16.0	10.9	2.8	9.4	11.1	3.2	19.0	17.8	19.0	19.0	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.0	10.9	2.8	9.4	11.1	3.2	19.0	17.8	19.0	19.0	6.2
Queue Length 50th (m)	13.7	13.0	0.0	2.2	13.9	0.0	5.3	12.9	4.5	11.4	0.0
Queue Length 95th (m)	36.7	31.5	6.8	8.1	33.2	4.9	18.7	38.5	16.5	32.9	18.8
Internal Link Dist (m)		197.3			831.7			297.4		206.2	
Turn Bay Length (m)	160.0		120.0	150.0		115.0	110.0		145.0		85.0
Base Capacity (vph)	806	1398	1243	825	1398	1170	787	1165	717	1210	1193
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	0.31	0.19	0.10	0.06	0.20	0.05	0.11	0.21	0.10	0.15	0.38

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	229	244	111	46	257	58	79	142	78	67	165	415
Future Volume (vph)	229	244	111	46	257	58	79	142	78	67	165	415
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
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)	1755	1883	1633	1772	1883	1555	1825	1807		1755	1902	1617
Flt Permitted	0.59	1.00	1.00	0.60	1.00	1.00	0.64	1.00		0.61	1.00	1.00
Satd. Flow (perm)	1087	1883	1633	1111	1883	1555	1238	1807		1127	1902	1617
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	249	265	121	50	279	63	86	154	85	73	179	451
RTOR Reduction (vph)	0	0	70	0	0	36	0	30	0	0	0	334
Lane Group Flow (vph)	249	265	51	50	279	27	86	209	0	73	179	117
Heavy Vehicles (%)	4%	2%	0%	3%	2%	5%	0%	1%	0%	4%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	20.5	20.5	20.5	20.5	20.5	20.5	12.5	12.5		12.5	12.5	12.5
Effective Green, g (s)	20.5	20.5	20.5	20.5	20.5	20.5	12.5	12.5		12.5	12.5	12.5
Actuated g/C Ratio	0.42	0.42	0.42	0.42	0.42	0.42	0.26	0.26		0.26	0.26	0.26
Clearance Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	461	799	693	471	799	659	320	467		291	492	418
v/s Ratio Prot		0.14			0.15			c0.12			0.09	
v/s Ratio Perm	c0.23		0.03	0.04		0.02	0.07			0.06		0.07
v/c Ratio	0.54	0.33	0.07	0.11	0.35	0.04	0.27	0.45		0.25	0.36	0.28
Uniform Delay, d1	10.4	9.3	8.3	8.4	9.4	8.1	14.3	15.0		14.2	14.6	14.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.9	0.4	0.1	0.2	0.5	0.0	0.5	0.7		0.5	0.5	0.4
Delay (s)	12.3	9.7	8.3	8.6	9.9	8.2	14.7	15.7		14.6	15.1	14.7
Level of Service	B	A	A	A	A	A	B	B		B	B	B
Approach Delay (s)		10.5			9.4			15.4			14.8	
Approach LOS		B			A			B			B	

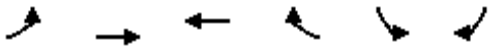
Intersection Summary			
HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	48.3	Sum of lost time (s)	15.3
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	296	5	0	293	32	1	11	3	21	23	44
Future Volume (Veh/h)	25	296	5	0	293	32	1	11	3	21	23	44
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	322	5	0	318	35	1	12	3	23	25	48
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	353			327			754	729	322	703	699	318
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	353			327			754	729	322	703	699	318
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.1	3.4
p0 queue free %	98			100			100	97	100	93	93	93
cM capacity (veh/h)	1189			1244			284	344	724	338	351	707

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	349	5	318	35	16	96
Volume Left	27	0	0	0	1	23
Volume Right	0	5	0	35	3	48
cSH	1189	1700	1244	1700	376	463
Volume to Capacity	0.02	0.00	0.00	0.02	0.04	0.21
Queue Length 95th (m)	0.5	0.0	0.0	0.0	1.0	5.9
Control Delay (s)	0.8	0.0	0.0	0.0	15.0	14.8
Lane LOS	A				B	B
Approach Delay (s)	0.8		0.0		15.0	14.8
Approach LOS					B	B

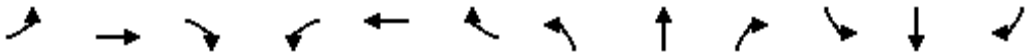
Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	53.8%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	389	360	0	0	0
Future Volume (Veh/h)	0	389	360	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	423	391	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)						
pX, platoon unblocked						
vC, conflicting volume	391				814	391
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	391				814	391
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1179				350	662

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	423	391	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1179	1700	1700
Volume to Capacity	0.00	0.23	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

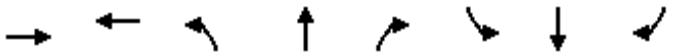
Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		23.8%	ICU Level of Service
Analysis Period (min)		15	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	1	6	6	2	1	2	1	14	4	1	0
Future Volume (vph)	0	1	6	6	2	1	2	1	14	4	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1	7	7	2	1	2	1	15	4	1	0

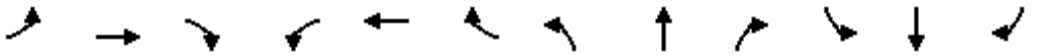
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	8	10	18	5
Volume Left (vph)	0	7	2	4
Volume Right (vph)	7	1	15	0
Hadj (s)	0.18	0.64	-0.29	1.86
Departure Headway (s)	4.1	4.6	3.7	5.8
Degree Utilization, x	0.01	0.01	0.02	0.01
Capacity (veh/h)	858	774	975	604
Control Delay (s)	7.2	7.7	6.7	8.9
Approach Delay (s)	7.2	7.7	6.7	8.9
Approach LOS	A	A	A	A

Intersection Summary				
Delay	7.3			
Level of Service	A			
Intersection Capacity Utilization	15.5%	ICU Level of Service	A	
Analysis Period (min)	15			



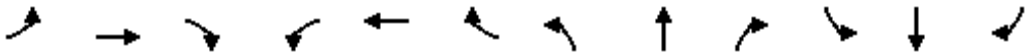
Lane Group	EBT	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	16	63	1	671	35	17	411	9
v/c Ratio	0.05	0.17	0.00	0.49	0.04	0.04	0.31	0.01
Control Delay	18.1	15.8	5.0	7.9	2.0	5.6	6.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	15.8	5.0	7.9	2.0	5.6	6.0	0.0
Queue Length 50th (m)	0.9	2.9	0.0	37.9	0.0	0.6	19.1	0.0
Queue Length 95th (m)	5.6	13.3	0.5	67.6	2.4	2.7	34.8	0.1
Internal Link Dist (m)	330.5	47.0		782.7			84.7	
Turn Bay Length (m)			113.0		180.0	50.0		15.0
Base Capacity (vph)	747	808	908	1676	1208	482	1644	1077
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	0.02	0.08	0.00	0.40	0.03	0.04	0.25	0.01

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	1	3	36	3	19	1	617	32	16	378	8
Future Volume (vph)	11	1	3	36	3	19	1	617	32	16	378	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.97			0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96			0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1427			1421		1825	1847	1328	1437	1812	1183
Flt Permitted		0.74			0.80		0.52	1.00	1.00	0.35	1.00	1.00
Satd. Flow (perm)		1094			1175		1001	1847	1328	531	1812	1183
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	1	3	39	3	21	1	671	35	17	411	9
RTOR Reduction (vph)	0	3	0	0	19	0	0	0	15	0	0	4
Lane Group Flow (vph)	0	13	0	0	44	0	1	671	20	17	411	5
Heavy Vehicles (%)	27%	0%	33%	24%	0%	31%	0%	4%	23%	27%	6%	38%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		4.8			4.8		25.0	25.0	25.0	25.0	25.0	25.0
Effective Green, g (s)		4.8			4.8		25.0	25.0	25.0	25.0	25.0	25.0
Actuated g/C Ratio		0.11			0.11		0.58	0.58	0.58	0.58	0.58	0.58
Clearance Time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Grp Cap (vph)		122			131		584	1078	775	310	1058	691
v/s Ratio Prot								c0.36			0.23	
v/s Ratio Perm		0.01			c0.04		0.00		0.02	0.03		0.00
v/c Ratio		0.11			0.34		0.00	0.62	0.03	0.05	0.39	0.01
Uniform Delay, d1		17.1			17.5		3.7	5.8	3.8	3.8	4.8	3.7
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.4			1.5		0.0	1.4	0.0	0.1	0.4	0.0
Delay (s)		17.5			19.1		3.7	7.2	3.8	4.0	5.2	3.7
Level of Service		B			B		A	A	A	A	A	A
Approach Delay (s)		17.5			19.1			7.1			5.1	
Approach LOS		B			B			A			A	

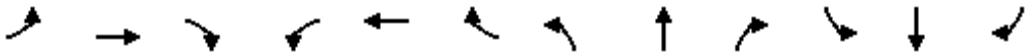
Intersection Summary			
HCM 2000 Control Delay	7.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	42.8	Sum of lost time (s)	13.0
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	32	11	0	49	2	4	0	0	0	0	3
Future Volume (Veh/h)	1	32	11	0	49	2	4	0	0	0	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	35	12	0	53	2	4	0	0	0	0	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		71										
pX, platoon unblocked												
vC, conflicting volume	55			47			100	98	41	97	103	54
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	55			47			100	98	41	97	103	54
tC, single (s)	4.1			4.1			8.1	6.5	6.2	7.1	6.5	6.5
tC, 2 stage (s)												
tF (s)	2.2			2.2			4.4	4.0	3.3	3.5	4.0	3.6
p0 queue free %	100			100			99	100	100	100	100	100
cM capacity (veh/h)	1563			1573			691	795	1036	890	790	932

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	48	55	4	3
Volume Left	1	0	4	0
Volume Right	12	2	0	3
cSH	1563	1573	691	932
Volume to Capacity	0.00	0.00	0.01	0.00
Queue Length 95th (m)	0.0	0.0	0.1	0.1
Control Delay (s)	0.2	0.0	10.2	8.9
Lane LOS	A		B	A
Approach Delay (s)	0.2	0.0	10.2	8.9
Approach LOS			B	A

Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	26	0	6	22	9	4	53	24	29	39	0
Future Volume (Veh/h)	3	26	0	6	22	9	4	53	24	29	39	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	28	0	7	24	10	4	58	26	32	42	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)												
pX, platoon unblocked												
vC, conflicting volume	207	198	42	199	185	71	42			84		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	207	198	42	199	185	71	42			84		
tC, single (s)	7.1	6.6	6.2	7.8	6.7	6.2	4.4			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	4.2	4.2	3.3	2.5			2.2		
p0 queue free %	100	96	100	99	96	99	100			98		
cM capacity (veh/h)	713	674	1034	595	662	997	1389			1494		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	31	41	88	74
Volume Left	3	7	4	32
Volume Right	0	10	26	0
cSH	678	706	1389	1494
Volume to Capacity	0.05	0.06	0.00	0.02
Queue Length 95th (m)	1.1	1.4	0.1	0.5
Control Delay (s)	10.6	10.4	0.4	3.3
Lane LOS	B	B	A	A
Approach Delay (s)	10.6	10.4	0.4	3.3
Approach LOS	B	B		

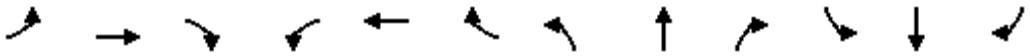
Intersection Summary				
Average Delay	4.4			
Intersection Capacity Utilization	20.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	280	182	49	83	321	114	96	308	48	132	266
v/c Ratio	0.65	0.24	0.07	0.16	0.43	0.16	0.27	0.59	0.19	0.26	0.43
Control Delay	21.4	11.3	3.0	11.1	13.4	3.1	19.3	21.9	18.9	18.4	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.4	11.3	3.0	11.1	13.4	3.1	19.3	21.9	18.9	18.4	5.3
Queue Length 50th (m)	19.2	10.0	0.0	4.4	19.5	0.0	6.9	22.4	3.4	9.4	0.0
Queue Length 95th (m)	50.8	25.2	4.0	13.6	45.0	7.3	20.7	54.1	12.3	25.6	14.8
Internal Link Dist (m)		197.3			831.7			297.4		206.2	
Turn Bay Length (m)	160.0		120.0	150.0		115.0	110.0		145.0		85.0
Base Capacity (vph)	682	1205	1024	820	1182	1090	736	1062	539	1042	989
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	0.15	0.05	0.10	0.27	0.10	0.13	0.29	0.09	0.13	0.27

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	258	167	45	76	295	105	88	212	72	44	121	245
Future Volume (vph)	258	167	45	76	295	105	88	212	72	44	121	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
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)	1690	1779	1484	1789	1746	1555	1789	1812		1601	1795	1512
Flt Permitted	0.57	1.00	1.00	0.64	1.00	1.00	0.67	1.00		0.55	1.00	1.00
Satd. Flow (perm)	1007	1779	1484	1210	1746	1555	1267	1812		931	1795	1512
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	280	182	49	83	321	114	96	230	78	48	132	266
RTOR Reduction (vph)	0	0	28	0	0	65	0	17	0	0	0	191
Lane Group Flow (vph)	280	182	21	83	321	49	96	291	0	48	132	75
Heavy Vehicles (%)	8%	8%	10%	2%	10%	5%	2%	2%	2%	14%	7%	8%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	23.2	23.2	23.2	23.2	23.2	23.2	15.2	15.2		15.2	15.2	15.2
Effective Green, g (s)	23.2	23.2	23.2	23.2	23.2	23.2	15.2	15.2		15.2	15.2	15.2
Actuated g/C Ratio	0.43	0.43	0.43	0.43	0.43	0.43	0.28	0.28		0.28	0.28	0.28
Clearance Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	435	768	641	522	754	671	358	512		263	508	427
v/s Ratio Prot		0.10			0.18			c0.16			0.07	
v/s Ratio Perm	c0.28		0.01	0.07		0.03	0.08			0.05		0.05
v/c Ratio	0.64	0.24	0.03	0.16	0.43	0.07	0.27	0.57		0.18	0.26	0.18
Uniform Delay, d1	12.0	9.6	8.8	9.3	10.6	8.9	14.9	16.4		14.6	14.9	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
Incremental Delay, d2	4.0	0.3	0.0	0.2	0.7	0.1	0.4	1.4		0.3	0.3	0.2
Delay (s)	16.0	9.9	8.8	9.5	11.3	9.0	15.3	17.9		14.9	15.2	14.7
Level of Service	B	A	A	A	B	A	B	B		B	B	B
Approach Delay (s)		13.1			10.5			17.3			14.9	
Approach LOS		B			B			B			B	

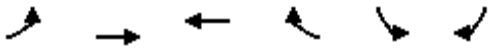
Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	53.7	Sum of lost time (s)	15.3
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	206	0	0	353	17	6	14	0	22	7	29
Future Volume (Veh/h)	19	206	0	0	353	17	6	14	0	22	7	29
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	224	0	0	384	18	7	15	0	24	8	32
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	402			224			686	668	224	658	650	384
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	402			224			686	668	224	658	650	384
tC, single (s)	4.4			4.1			7.1	6.5	6.2	7.2	6.5	6.5
tC, 2 stage (s)												
tF (s)	2.5			2.2			3.5	4.0	3.3	3.6	4.0	3.5
p0 queue free %	98			100			98	96	100	93	98	95
cM capacity (veh/h)	1016			1357			335	374	820	354	383	616

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	245	0	384	18	22	64
Volume Left	21	0	0	0	7	24
Volume Right	0	0	0	18	0	32
cSH	1016	1700	1357	1700	360	455
Volume to Capacity	0.02	0.00	0.00	0.01	0.06	0.14
Queue Length 95th (m)	0.5	0.0	0.0	0.0	1.5	3.7
Control Delay (s)	0.9	0.0	0.0	0.0	15.6	14.2
Lane LOS	A				C	B
Approach Delay (s)	0.9		0.0		15.6	14.2
Approach LOS					C	B

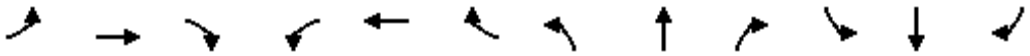
Intersection Summary				
Average Delay	2.0			
Intersection Capacity Utilization	38.2%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	28	255	448	3	3	28
Future Volume (Veh/h)	28	255	448	3	3	28
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	30	277	487	3	3	30
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	490				826	488
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	490				826	488
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				99	95
cM capacity (veh/h)	1084				335	583

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	307	490	33
Volume Left	30	0	3
Volume Right	0	3	30
cSH	1084	1700	547
Volume to Capacity	0.03	0.29	0.06
Queue Length 95th (m)	0.6	0.0	1.5
Control Delay (s)	1.1	0.0	12.0
Lane LOS	A		B
Approach Delay (s)	1.1	0.0	12.0
Approach LOS			B

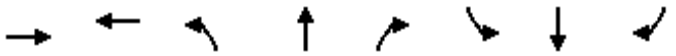
Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	46.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	0	0	13	0	1	0	0	18	3	1	0
Future Volume (vph)	0	0	0	13	0	1	0	0	18	3	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	14	0	1	0	0	20	3	1	0

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	0	15	20	4
Volume Left (vph)	0	14	0	3
Volume Right (vph)	0	1	20	0
Hadj (s)	0.00	0.15	-0.60	0.15
Departure Headway (s)	4.0	4.1	3.3	4.1
Degree Utilization, x	0.00	0.02	0.02	0.00
Capacity (veh/h)	900	870	1070	869
Control Delay (s)	7.0	7.2	6.4	7.1
Approach Delay (s)	0.0	7.2	6.4	7.1
Approach LOS	A	A	A	A

Intersection Summary				
Delay	6.8			
Level of Service	A			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A	
Analysis Period (min)	15			

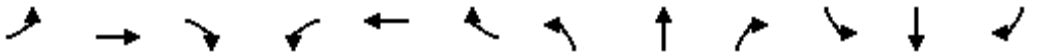


Lane Group	EBT	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	20	81	2	473	57	10	757	10
v/c Ratio	0.05	0.21	0.01	0.33	0.05	0.02	0.53	0.01
Control Delay	21.1	18.8	5.0	5.9	1.8	4.9	8.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.1	18.8	5.0	5.9	1.8	4.9	8.0	0.0
Queue Length 50th (m)	1.4	4.7	0.1	22.7	0.0	0.4	45.3	0.0
Queue Length 95th (m)	7.3	18.2	0.7	40.7	3.2	1.8	80.8	0.2
Internal Link Dist (m)	330.5	47.0		782.7			84.7	
Turn Bay Length (m)			113.0		180.0	50.0		15.0
Base Capacity (vph)	892	886	334	1645	1353	706	1661	1289
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	0.02	0.09	0.01	0.29	0.04	0.01	0.46	0.01

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	2	1	53	5	17	2	435	52	9	696	9
Future Volume (vph)	16	2	1	53	5	17	2	435	52	9	696	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.99			0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96			0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1830			1734		1217	1883	1541	1560	1902	1471
Flt Permitted		0.74			0.78		0.30	1.00	1.00	0.49	1.00	1.00
Satd. Flow (perm)		1412			1392		383	1883	1541	808	1902	1471
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	2	1	58	5	18	2	473	57	10	757	10
RTOR Reduction (vph)	0	1	0	0	16	0	0	0	22	0	0	4
Lane Group Flow (vph)	0	19	0	0	65	0	2	473	35	10	757	6
Heavy Vehicles (%)	0%	0%	0%	0%	0%	17%	50%	2%	6%	17%	1%	11%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		5.0			5.0		28.9	28.9	28.9	28.9	28.9	28.9
Effective Green, g (s)		5.0			5.0		28.9	28.9	28.9	28.9	28.9	28.9
Actuated g/C Ratio		0.11			0.11		0.62	0.62	0.62	0.62	0.62	0.62
Clearance Time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Grp Cap (vph)		150			148		236	1160	949	497	1172	906
v/s Ratio Prot								0.25			c0.40	
v/s Ratio Perm		0.01			c0.05		0.01		0.02	0.01		0.00
v/c Ratio		0.13			0.44		0.01	0.41	0.04	0.02	0.65	0.01
Uniform Delay, d1		19.0			19.6		3.5	4.6	3.5	3.5	5.7	3.5
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.4			2.1		0.0	0.4	0.0	0.0	1.5	0.0
Delay (s)		19.4			21.7		3.5	5.0	3.6	3.5	7.3	3.5
Level of Service		B			C		A	A	A	A	A	A
Approach Delay (s)		19.4			21.7			4.9			7.2	
Approach LOS		B			C			A			A	

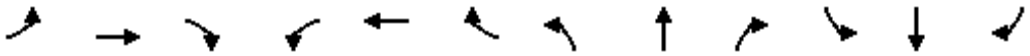
Intersection Summary			
HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	46.9	Sum of lost time (s)	13.0
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	55	3	0	59	0	22	0	4	0	0	3
Future Volume (Veh/h)	5	55	3	0	59	0	22	0	4	0	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	60	3	0	64	0	24	0	4	0	0	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		71										
pX, platoon unblocked												
vC, conflicting volume	64			63			138	136	62	140	137	64
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	64			63			138	136	62	140	137	64
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			97	100	100	100	100	100
cM capacity (veh/h)	1551			1553			801	757	1009	830	755	1006

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	68	64	28	3
Volume Left	5	0	24	0
Volume Right	3	0	4	3
cSH	1551	1553	825	1006
Volume to Capacity	0.00	0.00	0.03	0.00
Queue Length 95th (m)	0.1	0.0	0.8	0.1
Control Delay (s)	0.6	0.0	9.5	8.6
Lane LOS	A		A	A
Approach Delay (s)	0.6	0.0	9.5	8.6
Approach LOS			A	A

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	22.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	17	4	12	26	9	3	63	3	9	66	6
Future Volume (Veh/h)	9	17	4	12	26	9	3	63	3	9	66	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	18	4	13	28	10	3	68	3	10	72	7
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	195	172	76	184	174	70	79			71		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	195	172	76	184	174	70	79			71		
tC, single (s)	7.1	6.6	6.2	7.2	6.5	6.4	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.6	4.0	3.5	2.2			2.2		
p0 queue free %	99	97	100	98	96	99	100			99		
cM capacity (veh/h)	733	704	991	733	716	953	1532			1542		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	32	51	74	89
Volume Left	10	13	3	10
Volume Right	4	10	3	7
cSH	740	758	1532	1542
Volume to Capacity	0.04	0.07	0.00	0.01
Queue Length 95th (m)	1.0	1.6	0.0	0.1
Control Delay (s)	10.1	10.1	0.3	0.9
Lane LOS	B	B	A	A
Approach Delay (s)	10.1	10.1	0.3	0.9
Approach LOS	B	B		

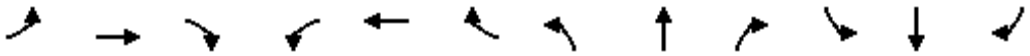
Intersection Summary				
Average Delay	3.8			
Intersection Capacity Utilization	17.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	267	285	130	53	300	67	92	257	78	192	485
v/c Ratio	0.59	0.36	0.17	0.11	0.37	0.10	0.29	0.51	0.27	0.39	0.64
Control Delay	17.7	11.5	2.9	9.9	11.7	3.3	19.7	18.9	19.7	19.6	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	17.7	11.5	2.9	9.9	11.7	3.3	19.7	18.9	19.7	19.6	7.5
Queue Length 50th (m)	15.8	14.9	0.0	2.5	15.9	0.0	6.3	15.7	5.3	13.5	2.3
Queue Length 95th (m)	44.2	37.2	7.5	9.3	39.2	5.5	20.1	42.6	17.9	35.7	25.1
Internal Link Dist (m)		197.3			831.7			297.4		206.2	
Turn Bay Length (m)	160.0		120.0	150.0		115.0	110.0		145.0		85.0
Base Capacity (vph)	761	1345	1203	779	1345	1130	749	1122	678	1164	1164
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	0.35	0.21	0.11	0.07	0.22	0.06	0.12	0.23	0.12	0.16	0.42

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	246	262	120	49	276	62	85	153	84	72	177	446
Future Volume (vph)	246	262	120	49	276	62	85	153	84	72	177	446
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
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)	1755	1883	1633	1772	1883	1555	1825	1807		1755	1902	1617
Flt Permitted	0.58	1.00	1.00	0.59	1.00	1.00	0.64	1.00		0.60	1.00	1.00
Satd. Flow (perm)	1066	1883	1633	1091	1883	1555	1223	1807		1109	1902	1617
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	267	285	130	53	300	67	92	166	91	78	192	485
RTOR Reduction (vph)	0	0	74	0	0	38	0	29	0	0	0	330
Lane Group Flow (vph)	267	285	56	53	300	29	92	228	0	78	192	155
Heavy Vehicles (%)	4%	2%	0%	3%	2%	5%	0%	1%	0%	4%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	21.9	21.9	21.9	21.9	21.9	21.9	13.4	13.4		13.4	13.4	13.4
Effective Green, g (s)	21.9	21.9	21.9	21.9	21.9	21.9	13.4	13.4		13.4	13.4	13.4
Actuated g/C Ratio	0.43	0.43	0.43	0.43	0.43	0.43	0.26	0.26		0.26	0.26	0.26
Clearance Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	461	814	706	472	814	673	323	478		293	503	428
v/s Ratio Prot		0.15			0.16			c0.13			0.10	
v/s Ratio Perm	c0.25		0.03	0.05		0.02	0.08			0.07		0.10
v/c Ratio	0.58	0.35	0.08	0.11	0.37	0.04	0.28	0.48		0.27	0.38	0.36
Uniform Delay, d1	10.9	9.6	8.4	8.6	9.7	8.3	14.8	15.7		14.7	15.2	15.1
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	2.5	0.5	0.1	0.2	0.5	0.0	0.5	0.8		0.5	0.5	0.5
Delay (s)	13.3	10.0	8.5	8.7	10.2	8.3	15.3	16.4		15.2	15.7	15.6
Level of Service	B	B	A	A	B	A	B	B		B	B	B
Approach Delay (s)		11.0			9.7			16.1			15.6	
Approach LOS		B			A			B			B	

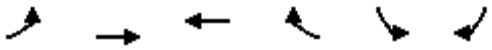
Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	50.6	Sum of lost time (s)	15.3
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	318	6	0	315	35	1	12	3	23	24	48
Future Volume (Veh/h)	27	318	6	0	315	35	1	12	3	23	24	48
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	346	7	0	342	38	1	13	3	25	26	52
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	380			353			811	784	346	756	753	342
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	380			353			811	784	346	756	753	342
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.1	3.4
p0 queue free %	98			100			100	96	100	92	92	92
cM capacity (veh/h)	1162			1217			256	319	702	310	326	685

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	375	7	342	38	17	103
Volume Left	29	0	0	0	1	25
Volume Right	0	7	0	38	3	52
cSH	1162	1700	1217	1700	348	436
Volume to Capacity	0.02	0.00	0.00	0.02	0.05	0.24
Queue Length 95th (m)	0.6	0.0	0.0	0.0	1.2	6.9
Control Delay (s)	0.9	0.0	0.0	0.0	15.9	15.8
Lane LOS	A				C	C
Approach Delay (s)	0.9		0.0		15.9	15.8
Approach LOS					C	C

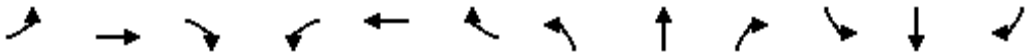
Intersection Summary				
Average Delay	2.5			
Intersection Capacity Utilization	57.0%	ICU Level of Service		B
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	418	387	0	0	0
Future Volume (Veh/h)	0	418	387	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	454	421	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)						
pX, platoon unblocked						
vC, conflicting volume	421				875	421
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	421				875	421
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1149				322	637

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	454	421	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1149	1700	1700
Volume to Capacity	0.00	0.25	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

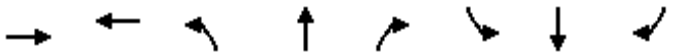
Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		25.3%	ICU Level of Service A
Analysis Period (min)		15	



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	11	6	6	12	1	2	1	14	4	1	0
Future Volume (vph)	0	11	6	6	12	1	2	1	14	4	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	12	7	7	13	1	2	1	15	4	1	0

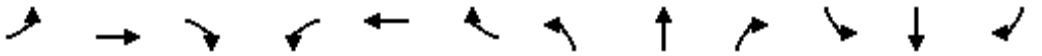
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	19	21	18	5
Volume Left (vph)	0	7	2	4
Volume Right (vph)	7	1	15	0
Hadj (s)	1.06	0.31	-0.29	1.86
Departure Headway (s)	5.0	4.3	3.7	5.9
Degree Utilization, x	0.03	0.02	0.02	0.01
Capacity (veh/h)	707	831	955	596
Control Delay (s)	8.2	7.4	6.8	8.9
Approach Delay (s)	8.2	7.4	6.8	8.9
Approach LOS	A	A	A	A

Intersection Summary				
Delay	7.6			
Level of Service	A			
Intersection Capacity Utilization	16.0%	ICU Level of Service	A	
Analysis Period (min)	15			



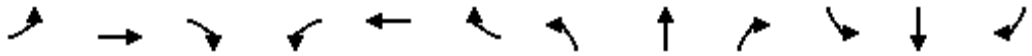
Lane Group	EBT	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	27	63	12	666	35	17	407	9
v/c Ratio	0.08	0.17	0.02	0.49	0.04	0.04	0.31	0.01
Control Delay	14.6	15.8	5.3	7.9	2.0	5.7	6.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.6	15.8	5.3	7.9	2.0	5.7	6.1	0.0
Queue Length 50th (m)	0.9	2.9	0.4	37.5	0.0	0.6	18.9	0.0
Queue Length 95th (m)	6.9	13.2	2.1	67.2	2.4	2.7	34.5	0.2
Internal Link Dist (m)	330.5	47.0		782.7			84.7	
Turn Bay Length (m)			113.0		180.0	50.0		15.0
Base Capacity (vph)	786	802	914	1679	1211	488	1647	1079
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	0.03	0.08	0.01	0.40	0.03	0.03	0.25	0.01

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	1	13	36	3	19	11	613	32	16	374	8
Future Volume (vph)	11	1	13	36	3	19	11	613	32	16	374	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.93			0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98			0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1354			1421		1825	1847	1328	1437	1812	1183
Flt Permitted		0.83			0.80		0.52	1.00	1.00	0.35	1.00	1.00
Satd. Flow (perm)		1144			1166		1005	1847	1328	536	1812	1183
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	1	14	39	3	21	12	666	35	17	407	9
RTOR Reduction (vph)	0	12	0	0	19	0	0	0	15	0	0	4
Lane Group Flow (vph)	0	15	0	0	44	0	12	666	20	17	407	5
Heavy Vehicles (%)	27%	0%	33%	24%	0%	31%	0%	4%	23%	27%	6%	38%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		4.8			4.8		24.9	24.9	24.9	24.9	24.9	24.9
Effective Green, g (s)		4.8			4.8		24.9	24.9	24.9	24.9	24.9	24.9
Actuated g/C Ratio		0.11			0.11		0.58	0.58	0.58	0.58	0.58	0.58
Clearance Time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Grp Cap (vph)		128			131		586	1077	774	312	1056	689
v/s Ratio Prot								c0.36			0.22	
v/s Ratio Perm		0.01			c0.04		0.01		0.02	0.03		0.00
v/c Ratio		0.11			0.34		0.02	0.62	0.03	0.05	0.39	0.01
Uniform Delay, d1		17.0			17.5		3.8	5.8	3.8	3.8	4.8	3.7
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.4			1.5		0.0	1.4	0.0	0.1	0.4	0.0
Delay (s)		17.4			19.0		3.8	7.2	3.8	4.0	5.2	3.7
Level of Service		B			B		A	A	A	A	A	A
Approach Delay (s)		17.4			19.0			7.0			5.1	
Approach LOS		B			B			A			A	

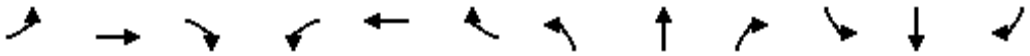
Intersection Summary			
HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	42.7	Sum of lost time (s)	13.0
Intersection Capacity Utilization	51.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	32	11	0	49	2	4	0	0	0	0	3
Future Volume (Veh/h)	1	32	11	0	49	2	4	0	0	0	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	35	12	0	53	2	4	0	0	0	0	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		71										
pX, platoon unblocked												
vC, conflicting volume	55			47			100	98	41	97	103	54
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	55			47			100	98	41	97	103	54
tC, single (s)	4.1			4.1			8.1	6.5	6.2	7.1	6.5	6.5
tC, 2 stage (s)												
tF (s)	2.2			2.2			4.4	4.0	3.3	3.5	4.0	3.6
p0 queue free %	100			100			99	100	100	100	100	100
cM capacity (veh/h)	1563			1573			691	795	1036	890	790	932

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	48	55	4	3
Volume Left	1	0	4	0
Volume Right	12	2	0	3
cSH	1563	1573	691	932
Volume to Capacity	0.00	0.00	0.01	0.00
Queue Length 95th (m)	0.0	0.0	0.1	0.1
Control Delay (s)	0.2	0.0	10.2	8.9
Lane LOS	A		B	A
Approach Delay (s)	0.2	0.0	10.2	8.9
Approach LOS			B	A

Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A	
Analysis Period (min)	15			



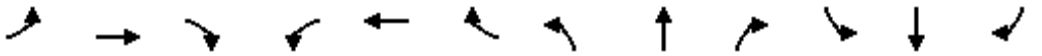
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	26	0	6	22	9	4	53	24	29	39	0
Future Volume (Veh/h)	3	26	0	6	22	9	4	53	24	29	39	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	28	0	7	24	10	4	58	26	32	42	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)												
pX, platoon unblocked												
vC, conflicting volume	207	198	42	199	185	71	42			84		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	207	198	42	199	185	71	42			84		
tC, single (s)	7.1	6.6	6.2	7.8	6.7	6.2	4.4			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	4.2	4.2	3.3	2.5			2.2		
p0 queue free %	100	96	100	99	96	99	100			98		
cM capacity (veh/h)	713	674	1034	595	662	997	1389			1494		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	31	41	88	74
Volume Left	3	7	4	32
Volume Right	0	10	26	0
cSH	678	706	1389	1494
Volume to Capacity	0.05	0.06	0.00	0.02
Queue Length 95th (m)	1.1	1.4	0.1	0.5
Control Delay (s)	10.6	10.4	0.4	3.3
Lane LOS	B	B	A	A
Approach Delay (s)	10.6	10.4	0.4	3.3
Approach LOS	B	B		

Intersection Summary				
Average Delay	4.4			
Intersection Capacity Utilization	20.3%	ICU Level of Service	A	
Analysis Period (min)	15			

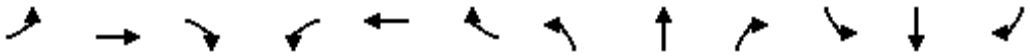
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	280	176	49	83	315	120	96	308	54	132	266
v/c Ratio	0.66	0.23	0.07	0.16	0.43	0.17	0.27	0.59	0.21	0.26	0.43
Control Delay	21.5	11.3	3.0	11.1	13.4	3.1	19.2	21.7	19.1	18.2	5.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.5	11.3	3.0	11.1	13.4	3.1	19.2	21.7	19.1	18.2	5.3
Queue Length 50th (m)	19.1	9.6	0.0	4.4	18.9	0.0	6.8	22.0	3.7	9.3	0.0
Queue Length 95th (m)	50.7	24.5	4.0	13.6	44.0	7.5	20.7	54.1	13.4	25.6	14.8
Internal Link Dist (m)		197.3			831.7			297.4		206.2	
Turn Bay Length (m)	160.0		120.0	150.0		115.0	110.0		145.0		85.0
Base Capacity (vph)	688	1211	1029	828	1188	1096	739	1067	545	1047	992
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	0.15	0.05	0.10	0.27	0.11	0.13	0.29	0.10	0.13	0.27

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	258	162	45	76	290	110	88	212	72	50	121	245
Future Volume (vph)	258	162	45	76	290	110	88	212	72	50	121	245
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
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)	1690	1779	1484	1789	1746	1555	1789	1812		1601	1795	1512
Flt Permitted	0.57	1.00	1.00	0.65	1.00	1.00	0.67	1.00		0.55	1.00	1.00
Satd. Flow (perm)	1012	1779	1484	1217	1746	1555	1267	1812		934	1795	1512
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	280	176	49	83	315	120	96	230	78	54	132	266
RTOR Reduction (vph)	0	0	28	0	0	69	0	17	0	0	0	190
Lane Group Flow (vph)	280	176	21	83	315	51	96	291	0	54	132	76
Heavy Vehicles (%)	8%	8%	10%	2%	10%	5%	2%	2%	2%	14%	7%	8%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	22.9	22.9	22.9	22.9	22.9	22.9	15.2	15.2		15.2	15.2	15.2
Effective Green, g (s)	22.9	22.9	22.9	22.9	22.9	22.9	15.2	15.2		15.2	15.2	15.2
Actuated g/C Ratio	0.43	0.43	0.43	0.43	0.43	0.43	0.28	0.28		0.28	0.28	0.28
Clearance Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	433	762	636	521	748	666	360	515		265	510	430
v/s Ratio Prot		0.10			0.18			c0.16			0.07	
v/s Ratio Perm	c0.28		0.01	0.07		0.03	0.08			0.06		0.05
v/c Ratio	0.65	0.23	0.03	0.16	0.42	0.08	0.27	0.56		0.20	0.26	0.18
Uniform Delay, d1	12.1	9.7	8.8	9.3	10.6	9.0	14.8	16.3		14.5	14.7	14.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.1	0.3	0.0	0.2	0.7	0.1	0.4	1.4		0.4	0.3	0.2
Delay (s)	16.1	9.9	8.9	9.6	11.3	9.1	15.2	17.7		14.9	15.0	14.6
Level of Service	B	A	A	A	B	A	B	B		B	B	B
Approach Delay (s)		13.3			10.5			17.1			14.7	
Approach LOS		B			B			B			B	

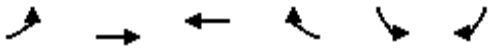
Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	53.4	Sum of lost time (s)	15.3
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	205	0	0	352	17	6	14	0	22	7	29
Future Volume (Veh/h)	19	205	0	0	352	17	6	14	0	22	7	29
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	223	0	0	383	18	7	15	0	24	8	32
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	401			223			684	666	223	656	648	383
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	401			223			684	666	223	656	648	383
tC, single (s)	4.4			4.1			7.1	6.5	6.2	7.2	6.5	6.5
tC, 2 stage (s)												
tF (s)	2.5			2.2			3.5	4.0	3.3	3.6	4.0	3.5
p0 queue free %	98			100			98	96	100	93	98	95
cM capacity (veh/h)	1017			1358			336	375	822	355	384	617

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	244	0	383	18	22	64
Volume Left	21	0	0	0	7	24
Volume Right	0	0	0	18	0	32
cSH	1017	1700	1358	1700	361	456
Volume to Capacity	0.02	0.00	0.00	0.01	0.06	0.14
Queue Length 95th (m)	0.5	0.0	0.0	0.0	1.5	3.7
Control Delay (s)	0.9	0.0	0.0	0.0	15.6	14.2
Lane LOS	A				C	B
Approach Delay (s)	0.9		0.0		15.6	14.2
Approach LOS					C	B

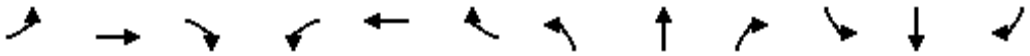
Intersection Summary				
Average Delay	2.0			
Intersection Capacity Utilization	38.1%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	29	255	448	2	2	29
Future Volume (Veh/h)	29	255	448	2	2	29
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	277	487	2	2	32
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	489				829	488
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	489				829	488
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				99	95
cM capacity (veh/h)	1085				333	584

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	309	489	34
Volume Left	32	0	2
Volume Right	0	2	32
cSH	1085	1700	559
Volume to Capacity	0.03	0.29	0.06
Queue Length 95th (m)	0.7	0.0	1.5
Control Delay (s)	1.1	0.0	11.9
Lane LOS	A		B
Approach Delay (s)	1.1	0.0	11.9
Approach LOS			B

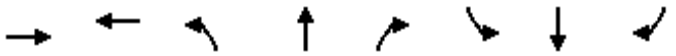
Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	0	0	13	0	1	0	0	18	3	1	0
Future Volume (vph)	0	0	0	13	0	1	0	0	18	3	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	14	0	1	0	0	20	3	1	0

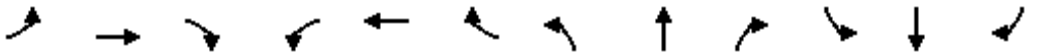
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	0	15	20	4
Volume Left (vph)	0	14	0	3
Volume Right (vph)	0	1	20	0
Hadj (s)	0.00	0.15	-0.60	0.15
Departure Headway (s)	4.0	4.1	3.3	4.1
Degree Utilization, x	0.00	0.02	0.02	0.00
Capacity (veh/h)	900	870	1070	869
Control Delay (s)	7.0	7.2	6.4	7.1
Approach Delay (s)	0.0	7.2	6.4	7.1
Approach LOS	A	A	A	A

Intersection Summary				
Delay	6.8			
Level of Service	A			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A	
Analysis Period (min)	15			



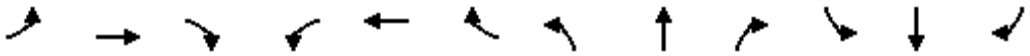
Lane Group	EBT	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	20	81	2	473	57	10	757	10
v/c Ratio	0.05	0.21	0.01	0.33	0.05	0.02	0.53	0.01
Control Delay	21.1	18.8	5.0	5.9	1.8	4.9	8.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.1	18.8	5.0	5.9	1.8	4.9	8.0	0.0
Queue Length 50th (m)	1.4	4.7	0.1	22.7	0.0	0.4	45.3	0.0
Queue Length 95th (m)	7.3	18.2	0.7	40.7	3.2	1.8	80.8	0.2
Internal Link Dist (m)	330.5	47.0		782.7			84.7	
Turn Bay Length (m)			113.0		180.0	50.0		15.0
Base Capacity (vph)	892	886	334	1645	1353	706	1661	1289
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	0.02	0.09	0.01	0.29	0.04	0.01	0.46	0.01

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	2	1	53	5	17	2	435	52	9	696	9
Future Volume (vph)	16	2	1	53	5	17	2	435	52	9	696	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Lane Util. Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.99			0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96			0.97		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1830			1734		1217	1883	1541	1560	1902	1471
Flt Permitted		0.74			0.78		0.30	1.00	1.00	0.49	1.00	1.00
Satd. Flow (perm)		1412			1392		383	1883	1541	808	1902	1471
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	2	1	58	5	18	2	473	57	10	757	10
RTOR Reduction (vph)	0	1	0	0	16	0	0	0	22	0	0	4
Lane Group Flow (vph)	0	19	0	0	65	0	2	473	35	10	757	6
Heavy Vehicles (%)	0%	0%	0%	0%	0%	17%	50%	2%	6%	17%	1%	11%
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)		5.0			5.0		28.9	28.9	28.9	28.9	28.9	28.9
Effective Green, g (s)		5.0			5.0		28.9	28.9	28.9	28.9	28.9	28.9
Actuated g/C Ratio		0.11			0.11		0.62	0.62	0.62	0.62	0.62	0.62
Clearance Time (s)		6.0			6.0		7.0	7.0	7.0	7.0	7.0	7.0
Vehicle Extension (s)		3.0			3.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Grp Cap (vph)		150			148		236	1160	949	497	1172	906
v/s Ratio Prot								0.25			c0.40	
v/s Ratio Perm		0.01			c0.05		0.01		0.02	0.01		0.00
v/c Ratio		0.13			0.44		0.01	0.41	0.04	0.02	0.65	0.01
Uniform Delay, d1		19.0			19.6		3.5	4.6	3.5	3.5	5.7	3.5
Progression Factor		1.00			1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.4			2.1		0.0	0.4	0.0	0.0	1.5	0.0
Delay (s)		19.4			21.7		3.5	5.0	3.6	3.5	7.3	3.5
Level of Service		B			C		A	A	A	A	A	A
Approach Delay (s)		19.4			21.7			4.9			7.2	
Approach LOS		B			C			A			A	

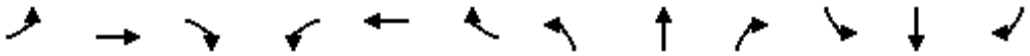
Intersection Summary			
HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	46.9	Sum of lost time (s)	13.0
Intersection Capacity Utilization	55.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	55	3	0	59	0	22	0	4	0	0	3
Future Volume (Veh/h)	5	55	3	0	59	0	22	0	4	0	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	60	3	0	64	0	24	0	4	0	0	3
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)		71										
pX, platoon unblocked												
vC, conflicting volume	64			63			138	136	62	140	137	64
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	64			63			138	136	62	140	137	64
tC, single (s)	4.1			4.1			7.2	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			97	100	100	100	100	100
cM capacity (veh/h)	1551			1553			801	757	1009	830	755	1006

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	68	64	28	3
Volume Left	5	0	24	0
Volume Right	3	0	4	3
cSH	1551	1553	825	1006
Volume to Capacity	0.00	0.00	0.03	0.00
Queue Length 95th (m)	0.1	0.0	0.8	0.1
Control Delay (s)	0.6	0.0	9.5	8.6
Lane LOS	A		A	A
Approach Delay (s)	0.6	0.0	9.5	8.6
Approach LOS			A	A

Intersection Summary				
Average Delay	2.0			
Intersection Capacity Utilization	22.0%	ICU Level of Service	A	
Analysis Period (min)	15			



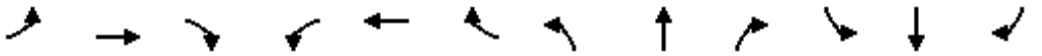
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	17	4	12	26	9	3	63	3	9	66	6
Future Volume (Veh/h)	9	17	4	12	26	9	3	63	3	9	66	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	18	4	13	28	10	3	68	3	10	72	7
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	195	172	76	184	174	70	79			71		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	195	172	76	184	174	70	79			71		
tC, single (s)	7.1	6.6	6.2	7.2	6.5	6.4	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.1	3.3	3.6	4.0	3.5	2.2			2.2		
p0 queue free %	99	97	100	98	96	99	100			99		
cM capacity (veh/h)	733	704	991	733	716	953	1532			1542		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	32	51	74	89
Volume Left	10	13	3	10
Volume Right	4	10	3	7
cSH	740	758	1532	1542
Volume to Capacity	0.04	0.07	0.00	0.01
Queue Length 95th (m)	1.0	1.6	0.0	0.1
Control Delay (s)	10.1	10.1	0.3	0.9
Lane LOS	B	B	A	A
Approach Delay (s)	10.1	10.1	0.3	0.9
Approach LOS	B	B		

Intersection Summary				
Average Delay	3.8			
Intersection Capacity Utilization	17.4%	ICU Level of Service	A	
Analysis Period (min)	15			

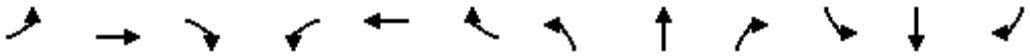
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	267	285	130	53	300	67	92	257	78	192	485
v/c Ratio	0.59	0.36	0.17	0.11	0.37	0.10	0.29	0.51	0.27	0.39	0.64
Control Delay	17.7	11.5	2.9	9.9	11.7	3.3	19.7	18.9	19.7	19.6	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.7	11.5	2.9	9.9	11.7	3.3	19.7	18.9	19.7	19.6	7.5
Queue Length 50th (m)	15.8	14.9	0.0	2.5	15.9	0.0	6.3	15.7	5.3	13.5	2.3
Queue Length 95th (m)	44.2	37.2	7.5	9.3	39.2	5.5	20.1	42.6	17.9	35.7	25.1
Internal Link Dist (m)		197.3			831.7			297.4		206.2	
Turn Bay Length (m)	160.0		120.0	150.0		115.0	110.0		145.0		85.0
Base Capacity (vph)	761	1345	1203	779	1345	1130	749	1122	678	1164	1164
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	0.35	0.21	0.11	0.07	0.22	0.06	0.12	0.23	0.12	0.16	0.42

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	246	262	120	49	276	62	85	153	84	72	177	446
Future Volume (vph)	246	262	120	49	276	62	85	153	84	72	177	446
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
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)	1755	1883	1633	1772	1883	1555	1825	1807		1755	1902	1617
Flt Permitted	0.58	1.00	1.00	0.59	1.00	1.00	0.64	1.00		0.60	1.00	1.00
Satd. Flow (perm)	1066	1883	1633	1091	1883	1555	1223	1807		1109	1902	1617
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	267	285	130	53	300	67	92	166	91	78	192	485
RTOR Reduction (vph)	0	0	74	0	0	38	0	29	0	0	0	330
Lane Group Flow (vph)	267	285	56	53	300	29	92	228	0	78	192	155
Heavy Vehicles (%)	4%	2%	0%	3%	2%	5%	0%	1%	0%	4%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		6
Actuated Green, G (s)	21.9	21.9	21.9	21.9	21.9	21.9	13.4	13.4		13.4	13.4	13.4
Effective Green, g (s)	21.9	21.9	21.9	21.9	21.9	21.9	13.4	13.4		13.4	13.4	13.4
Actuated g/C Ratio	0.43	0.43	0.43	0.43	0.43	0.43	0.26	0.26		0.26	0.26	0.26
Clearance Time (s)	7.9	7.9	7.9	7.9	7.9	7.9	7.4	7.4		7.4	7.4	7.4
Vehicle Extension (s)	4.5	4.5	4.5	4.5	4.5	4.5	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	461	814	706	472	814	673	323	478		293	503	428
v/s Ratio Prot		0.15			0.16			c0.13			0.10	
v/s Ratio Perm	c0.25		0.03	0.05		0.02	0.08			0.07		0.10
v/c Ratio	0.58	0.35	0.08	0.11	0.37	0.04	0.28	0.48		0.27	0.38	0.36
Uniform Delay, d1	10.9	9.6	8.4	8.6	9.7	8.3	14.8	15.7		14.7	15.2	15.1
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	2.5	0.5	0.1	0.2	0.5	0.0	0.5	0.8		0.5	0.5	0.5
Delay (s)	13.3	10.0	8.5	8.7	10.2	8.3	15.3	16.4		15.2	15.7	15.6
Level of Service	B	B	A	A	B	A	B	B		B	B	B
Approach Delay (s)		11.0			9.7			16.1			15.6	
Approach LOS		B			A			B			B	

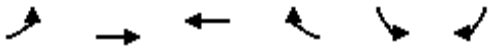
Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	50.6	Sum of lost time (s)	15.3
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	318	6	0	315	35	1	12	3	23	24	48
Future Volume (Veh/h)	27	318	6	0	315	35	1	12	3	23	24	48
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	346	7	0	342	38	1	13	3	25	26	52
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	380			353			811	784	346	756	753	342
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	380			353			811	784	346	756	753	342
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.1	3.4
p0 queue free %	98			100			100	96	100	92	92	92
cM capacity (veh/h)	1162			1217			256	319	702	310	326	685

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	375	7	342	38	17	103
Volume Left	29	0	0	0	1	25
Volume Right	0	7	0	38	3	52
cSH	1162	1700	1217	1700	348	436
Volume to Capacity	0.02	0.00	0.00	0.02	0.05	0.24
Queue Length 95th (m)	0.6	0.0	0.0	0.0	1.2	6.9
Control Delay (s)	0.9	0.0	0.0	0.0	15.9	15.8
Lane LOS	A				C	C
Approach Delay (s)	0.9		0.0		15.9	15.8
Approach LOS					C	C

Intersection Summary				
Average Delay	2.5			
Intersection Capacity Utilization	57.0%	ICU Level of Service		B
Analysis Period (min)	15			

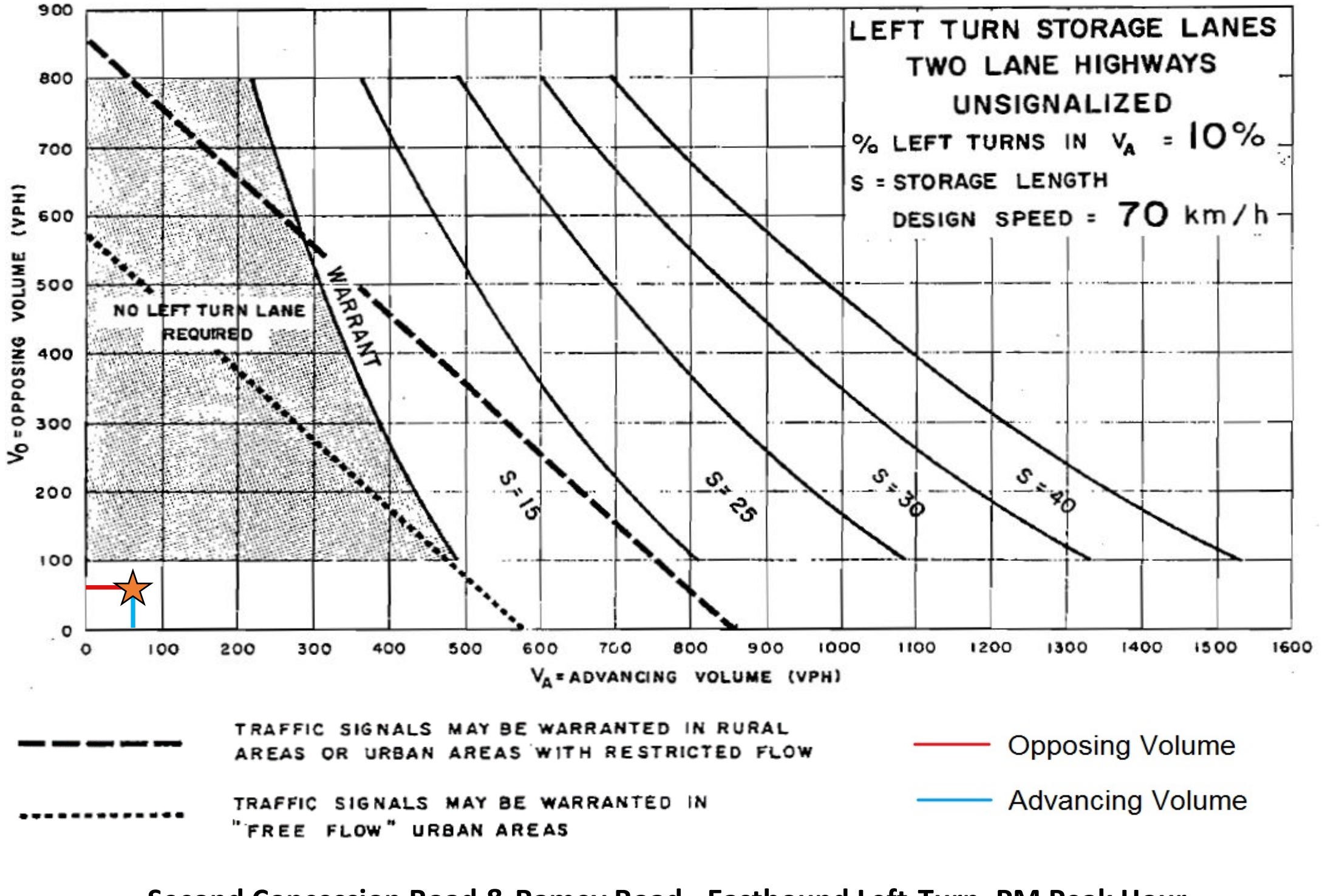


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	418	387	0	0	0
Future Volume (Veh/h)	0	418	387	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	454	421	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	421				875	421
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	421				875	421
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1149				322	637

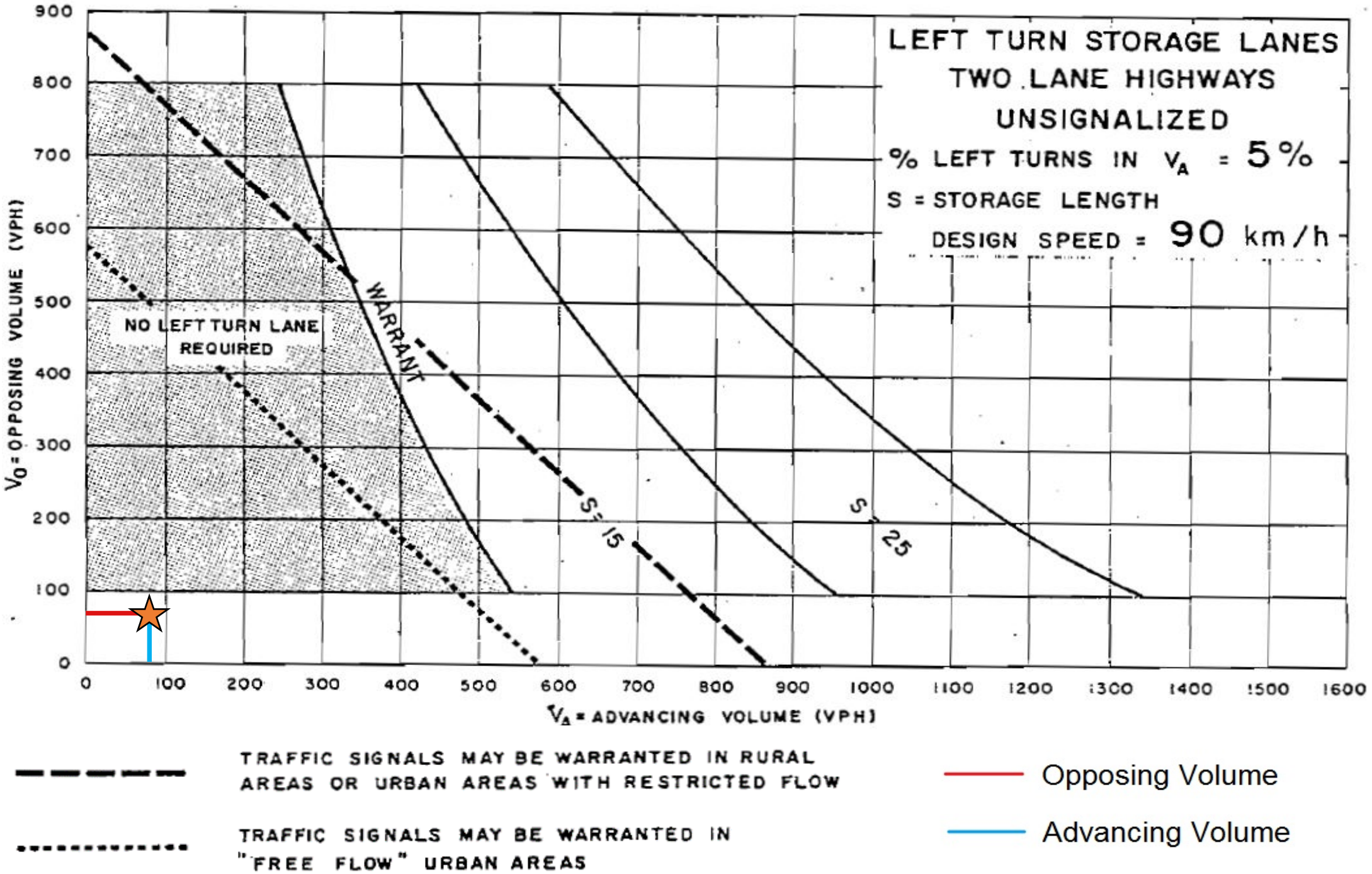
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	454	421	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1149	1700	1700
Volume to Capacity	0.00	0.25	0.00
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	25.3%	ICU Level of Service	A
Analysis Period (min)	15		

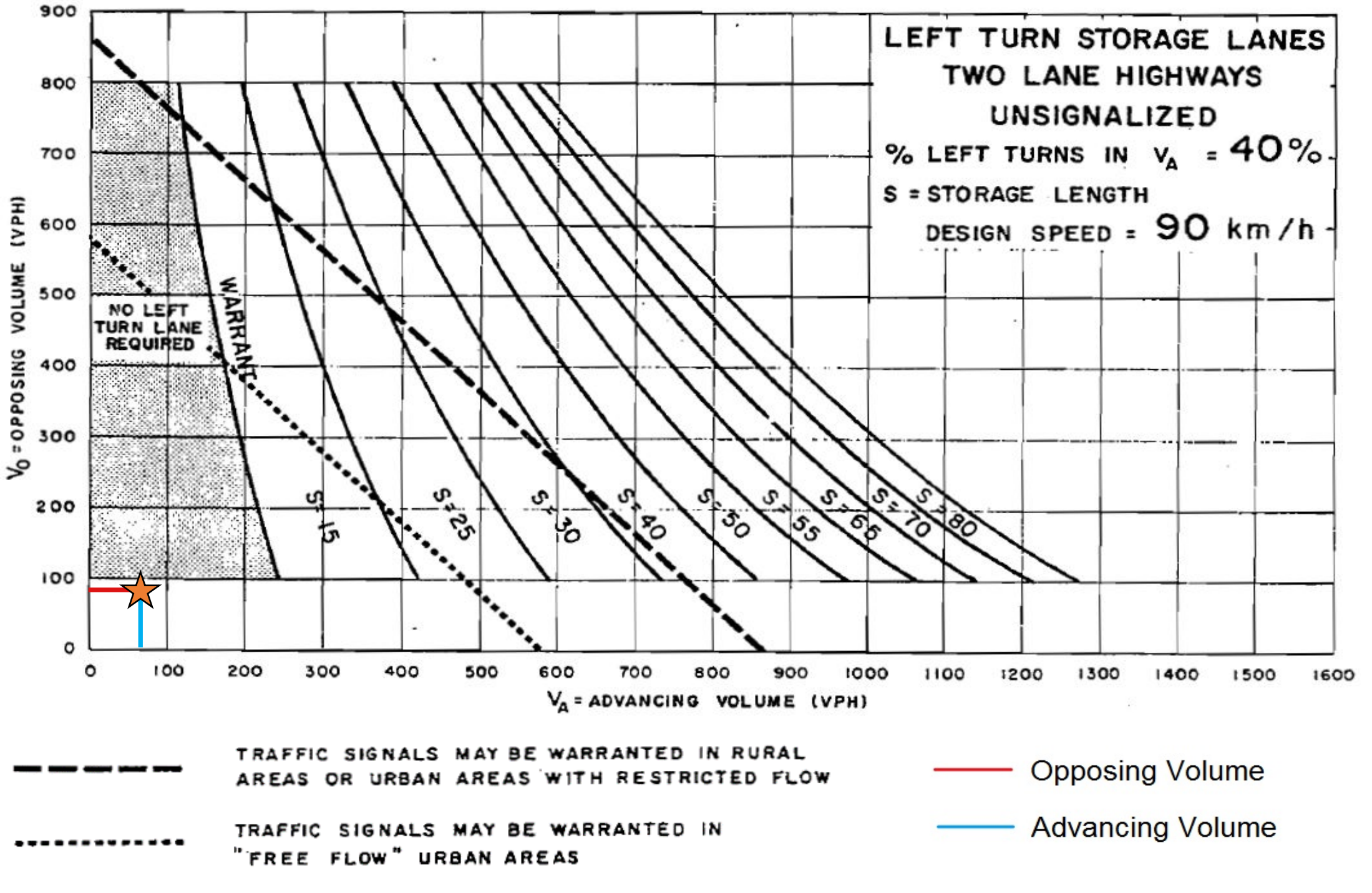
Appendix D – Left-Turn Warrants



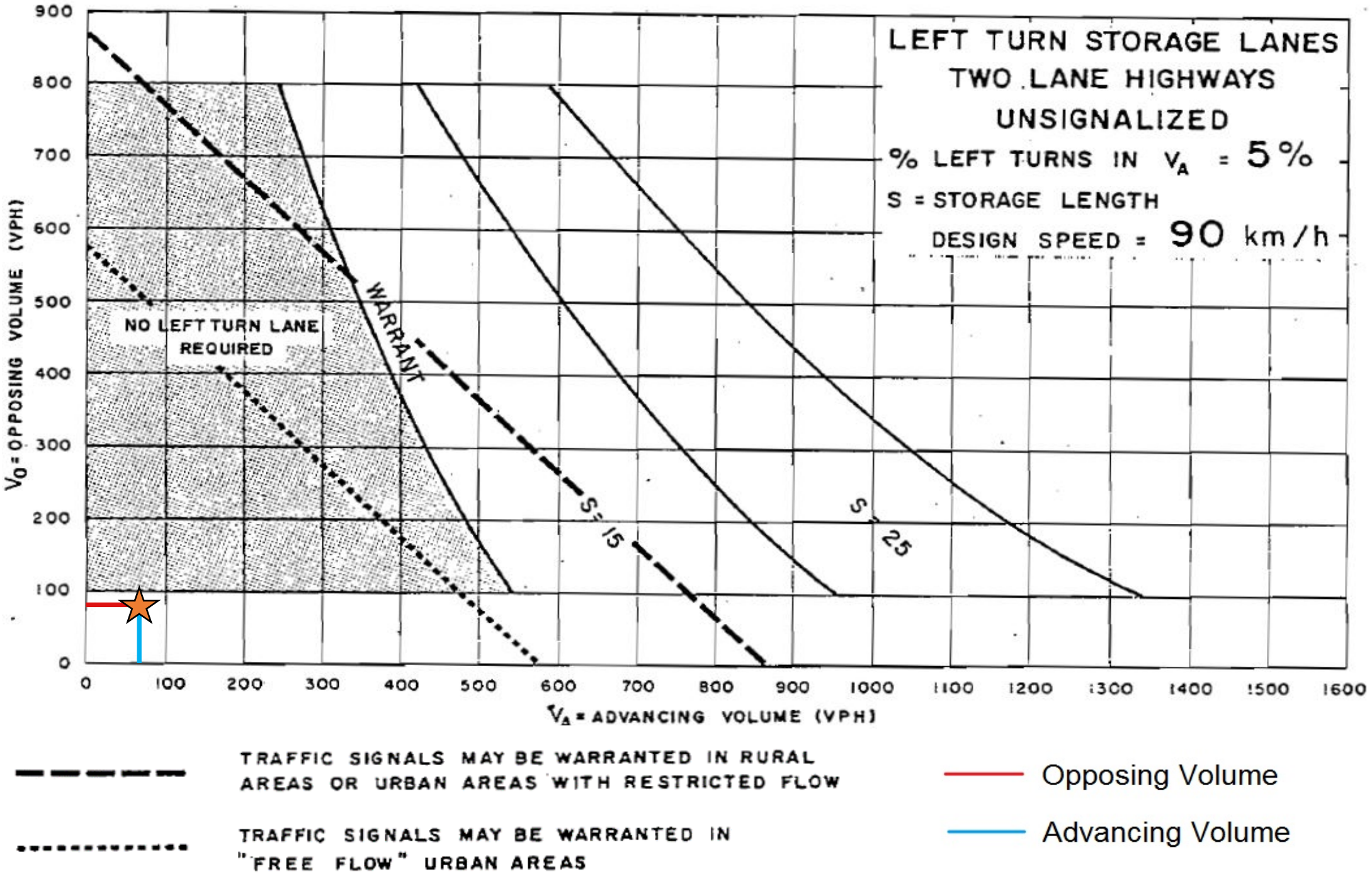
Second Concession Road & Ramey Road - Eastbound Left-Turn, PM Peak Hour



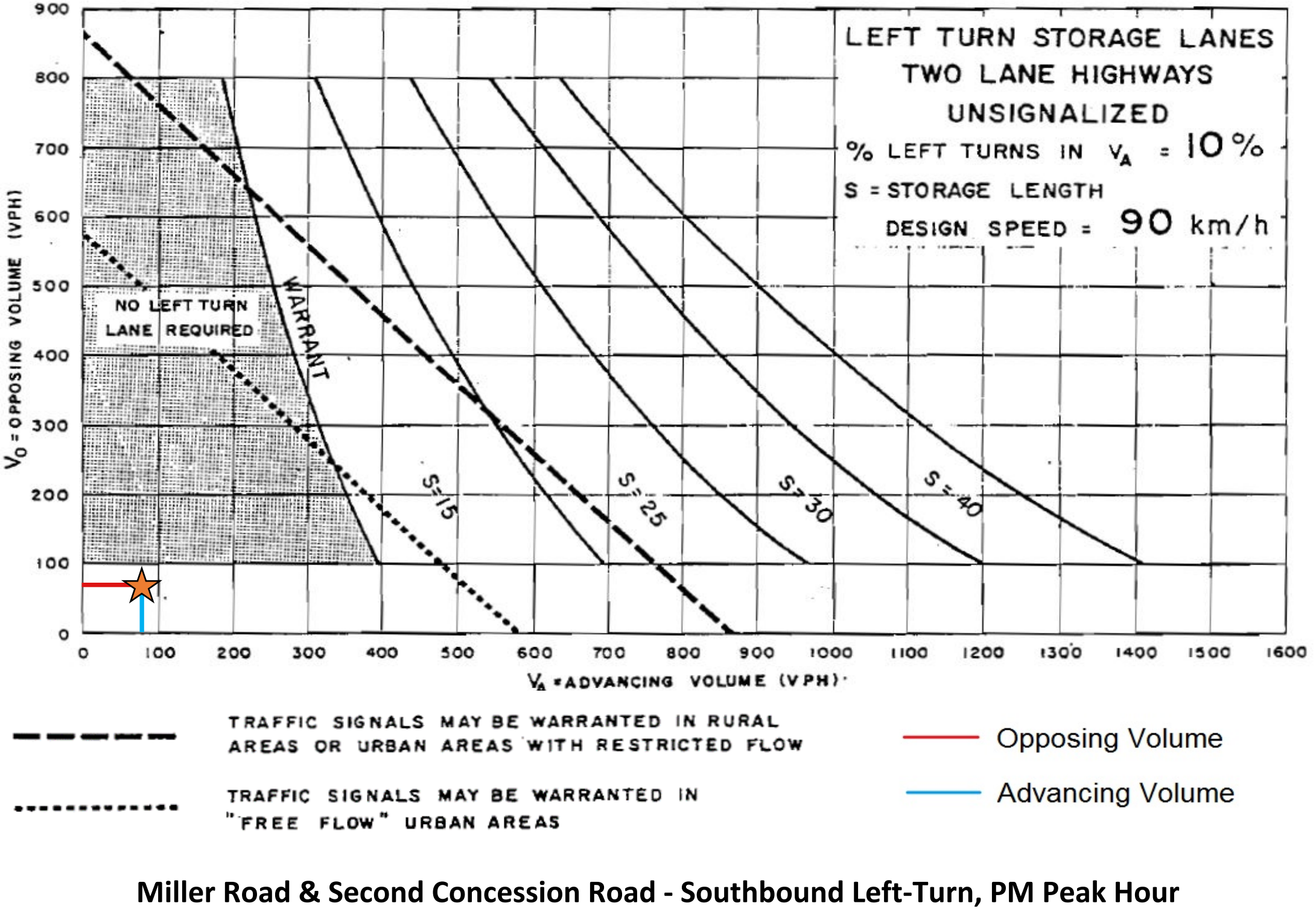
Miller Road & Second Concession Road - Northbound Left-Turn, AM Peak Hour



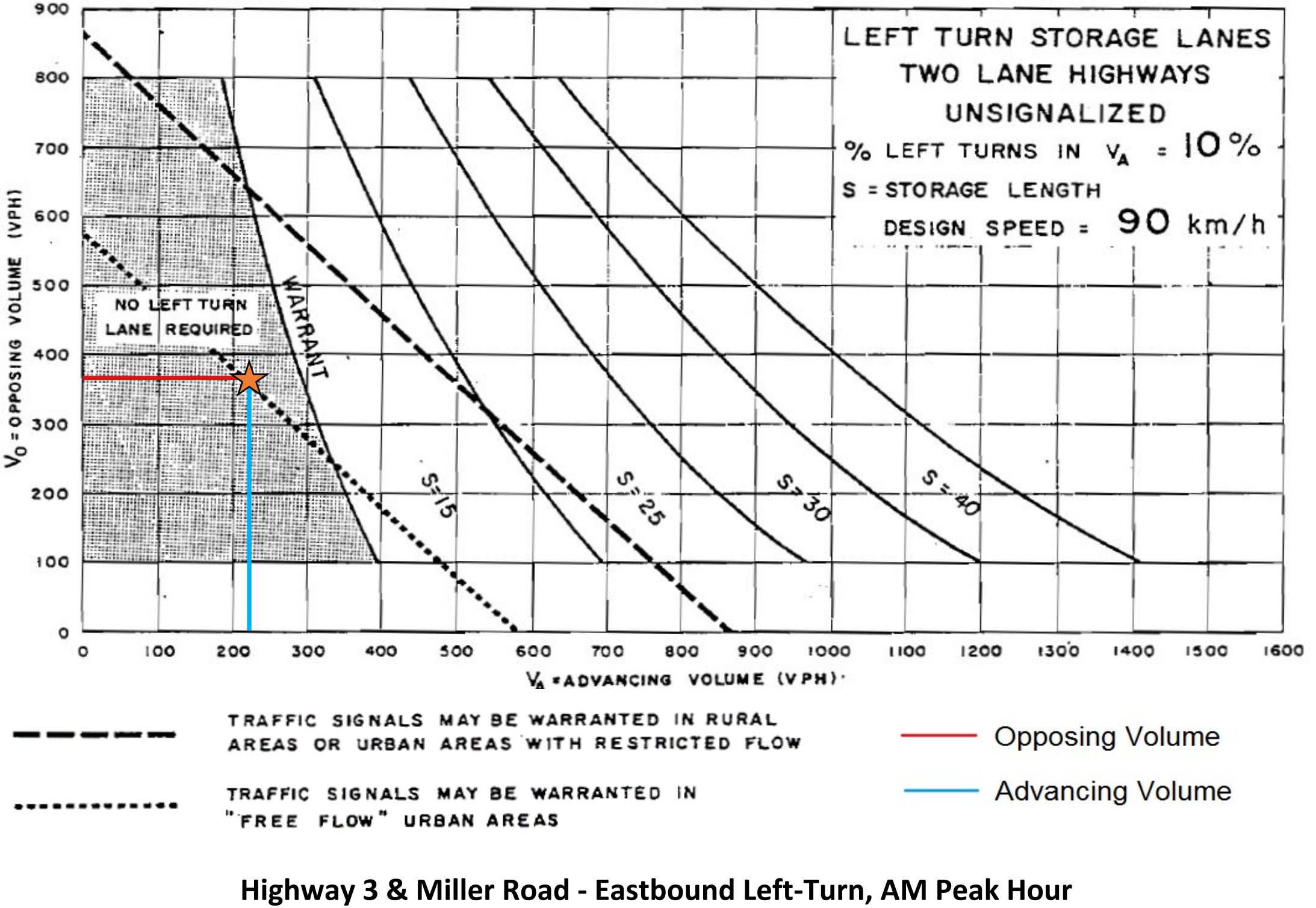
Miller Road & Second Concession Road - Southbound Left-Turn, AM Peak Hour



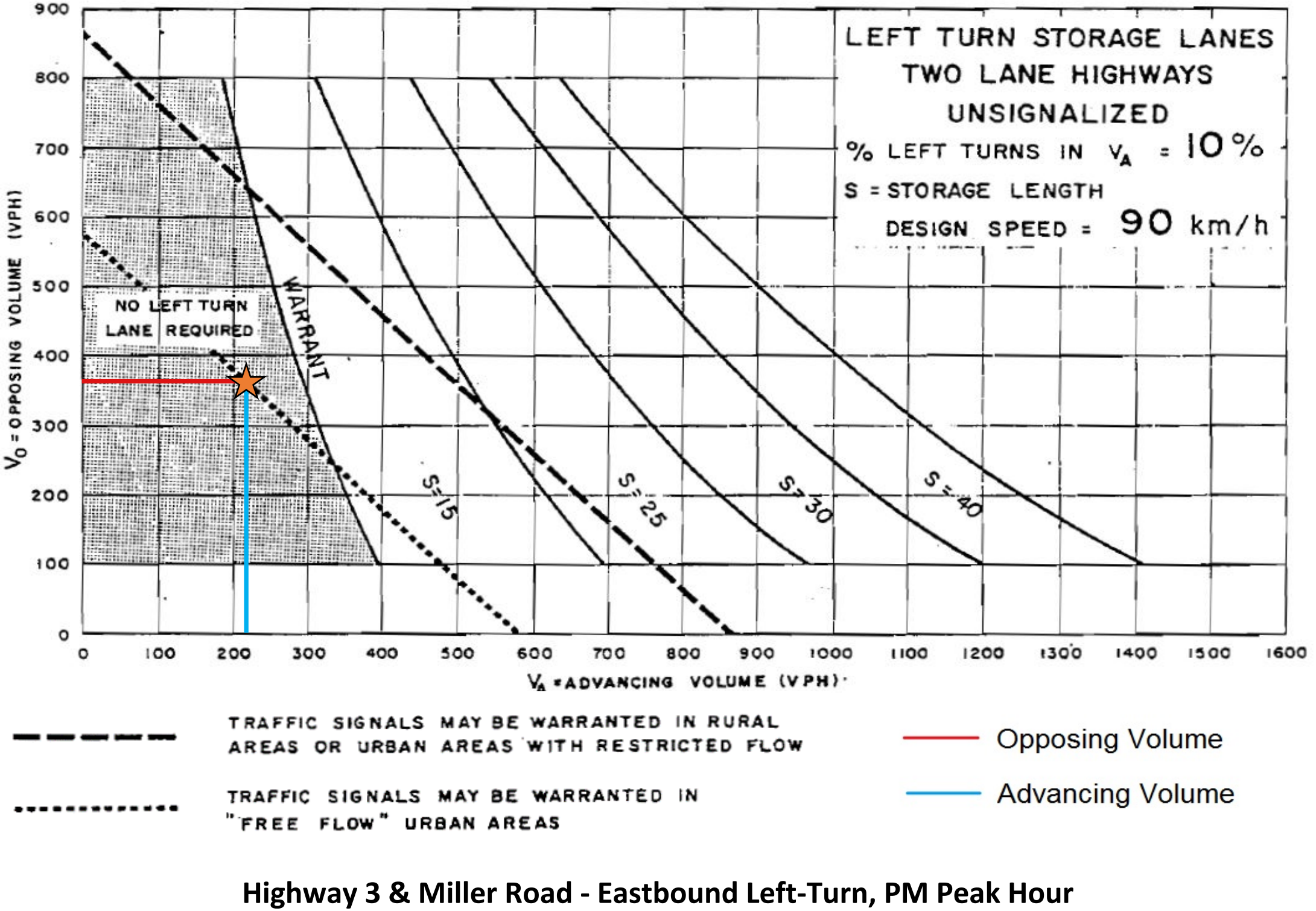
Miller Road & Second Concession Road - Northbound Left-Turn, PM Peak Hour



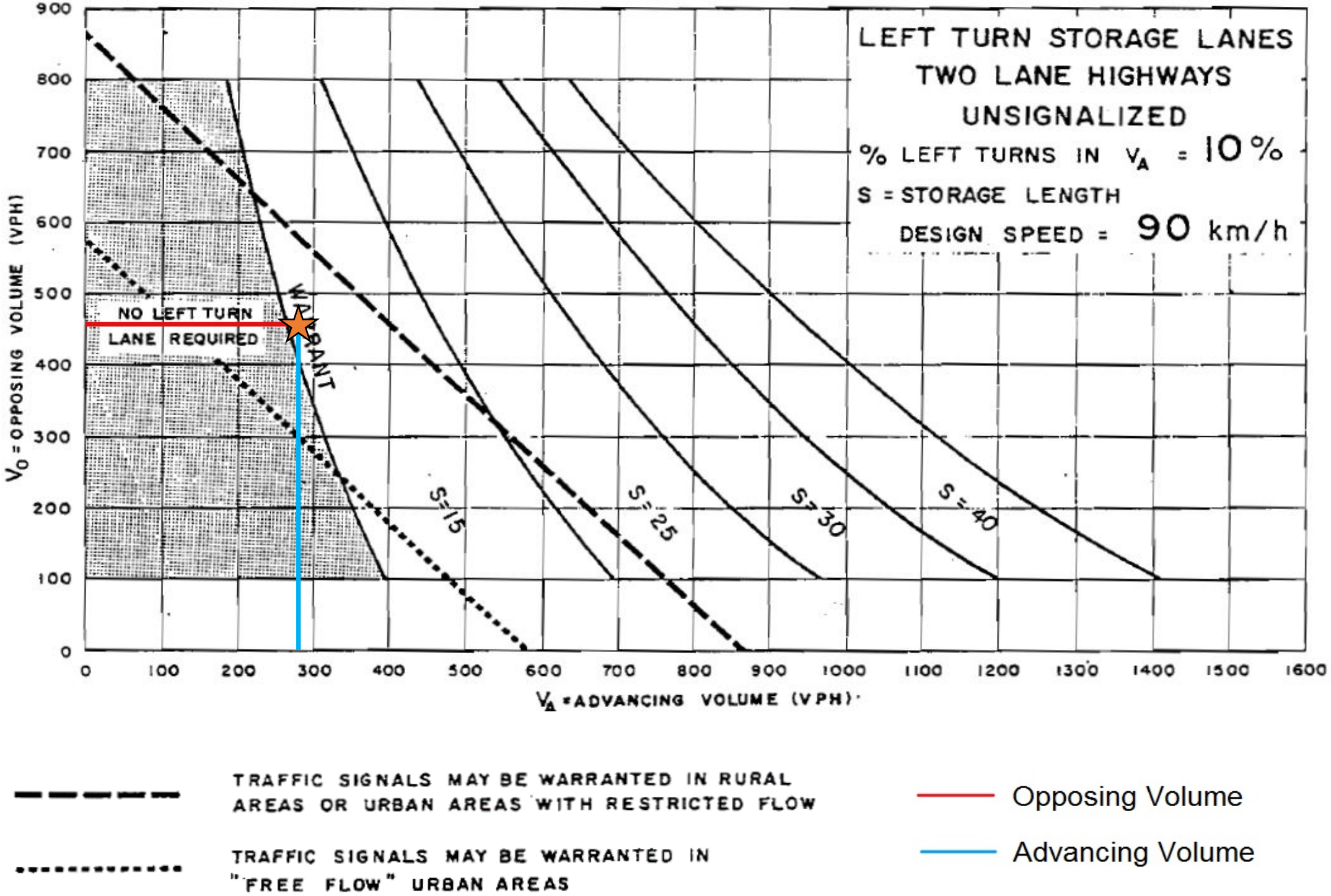
Miller Road & Second Concession Road - Southbound Left-Turn, PM Peak Hour



Highway 3 & Miller Road - Eastbound Left-Turn, AM Peak Hour



Highway 3 & Miller Road - Eastbound Left-Turn, PM Peak Hour



Highway 3 & Carl Road / Weaver Road - Eastbound Left-Turn, AM Peak Hour