Freymond Aggregates Quarry

2287 Bay Lake Road

Twp. of Faraday, Hastings County

Traffic Impact Study

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Prepared for:
Freymond Lumber Ltd

November, 2016

November 11, 2016

Freymond Lumber Ltd.
2287 Bay Lake Road
R.R. # 1
Bancroft, ON K0L 1C0

Attn: Lou Freymond

Dear Sir:

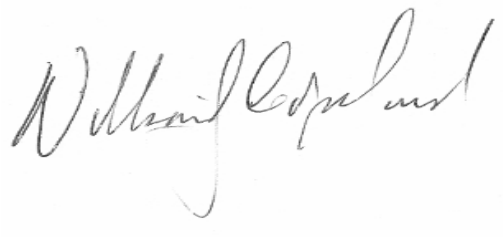
RE: Traffic Impact Study for the Proposed Freymond Aggregates Quarry to be Located at 2287 Bay Lake Road in the Township of Faraday, County of Hastings, Ontario

Tranplan Associates is pleased to present this traffic report for the proposed *Freymond Aggregates Quarry*. The quarry will be located just south of the Highway 62/Bay Lake Road intersection on the *Freymond Lumber Ltd* site at 2287 Bay Lake Road in the Township of Faraday, County of Hastings, Ontario. This study is an update to the initial traffic study completed in 2012. The study has assessed the traffic impacts of the proposed quarry operation based on summer 2015 traffic volumes and a reduced scale of future quarry operations.

Access to the quarry will be provided by the existing *South Site Entrance* to the *Freymond Lumber Ltd* site on the west side of Bay Lake Road. With improvements to the present southbound right turn taper at the Highway 62/Bay Lake Road intersection, adjacent roads and intersections will accommodate future site traffic from the new quarry.

Tranplan Associates is pleased to have the opportunity to work with the planning team in completing this traffic study for the *Freymond Aggregates Quarry.*

Yours truly,



William Copeland, P.Eng.

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1. INTRODUCTION

1.1 Background

Tranplan Associates is pleased to present the results of this traffic impact study carried out for the proposed *Freymond Aggregates Quarry*. This report has been prepared as part of the documentation for the planning approval process for the proposed quarry. It is our understanding that the approving agencies are the Township of Faraday, the County of Hastings.

The quarry will be located in part of Lots 51 and 52, Concession W.H.R. in the Township of Faraday, County of Hastings. The study site is located just south of the Town of Bancroft at 2287 Bay Lake Road, west of Highway 62 as illustrated in *Exhibit 1 – Key Map*.

Three site visits were carried out by Tranplan Associates staff during the summer of 2015. The purpose of the site visits was to examine access to the study site, assess current traffic operations, collect weekday peak period traffic data and evaluate intersection sight lines. The information gathered during these visits provided input to the traffic analyses. These analyses assessed the impacts of new traffic generated by the proposed quarry operation. As part of the preparation of this traffic report, the following additional information was taken into consideration:

- Comments received at the June 25th, 2015 Public Open House;
- Comments received by the County on July 1, 2015 from Steve Gaebel;
- Letter received by the County on July 14, 2015 from Tara McMurty, Adrianne Schutt and Daisy McCabe-Lokos;
- E-mail received by the County on September 16, 2015 from Sheila and Mike Schneider.

1.2 Principal Findings

The principal findings derived from the study analyses include the following:

- There will be no operational issues at the study intersections. All intersection turning movements are forecast to operate at acceptable Levels of Service[1] (LoS) with good volume to capacity (v/c) ratios during all site development scenarios.
- It has been assumed that the proposed quarry development operation will develop in four phases as illustrated in *Exhibit 2*
- Based on a 10 year planning horizon for the purposes of forecasting future background traffic, the new quarry, shipping a maximum of 300,000 T/year is forecast to generate 27 two-way trips during summer weekday peak hour periods, including employee, truck and service vehicle trips.

[1] See *Technical Appendix – Intersection Capacity Analyses* for definitions of Levels of Service

- Access to the new quarry will be via the existing south site entrance to the *Freymond Lumber Ltd.* mill. *Exhibit 3 – Study Intersections, South Site Entrance* illustrates the existing south site entrance to the mill.
- Based on Ministry of Transportation Ontario (MTO) standards for access to a local municipal road, an improved southbound right turn taper (75 - 80 m) would be required on Highway 62 to accommodate southbound right turns to Bay Lake Road. The existing sub-standard taper should be upgraded to MTO standards to provide a design consistent with the standard used in the Highway 62 corridor.
- Based on MTO criteria and standards there will be no warrant based on total 2025 summer peak hour volumes for either a northbound left turn lane to Bay Lake Road or a southbound left turn lane to serve the Rona entrance at the Highway 62 intersection with Bay Lake Road.
- Available sight distance at the intersection of Bay Lake Road and Highway 62 meets MTO criteria for the current posted speed of 70 kph on Highway 62.
- The existing south site entrance from the *Freymond Lumber Ltd*. mill to Bay Lake Road has sufficient turning sight distance (TSD) to provide adequate stopping sight distance (SSD).
- The south site entrance will require one inbound and one outbound lane to accommodate future site traffic. Each lane will require appropriate radii at the entrance to accommodate trucks entering and exiting the site.

The following sections of this report provide details of the traffic analyses used to develop the conclusions and study recommendations as summarized above.

2. EXISTING CONDITIONS

This chapter describes the roadway network, traffic volumes, operational analysis results and other notable characteristics under the baseline conditions.

2.1 The Study Site

The study site is located in the Township of Faraday just south of the Town of Bancroft, Ontario (see *Exhibit 1 – Key Map*). The quarry site is located on part of Lots 51 and 52, Concession W.H.R. in the Township of Faraday that is adjacent to the *Freymond Lumber Ltd*. lumber mill located at 2287 Bay Lake Road. The quarry will be located in the northern portion of the study site. The layout of the mill facilities and location of the proposed quarry are illustrated in *Exhibit 2.* The mill itself includes both sawing and planing operations. There are two access points from the site to Bay Lake Road as illustrated in *Exhibit 2.* The south entrance is the main access point into the mill and presently accommodates almost all site traffic. A secondary access point into the mill is located about 180 m to the north. This north entrance is normally gated and provides limited restricted use. This area to the north presently provides storage for other *Freymond* operations and equipment. Remaining portions of the study site are undeveloped and primarily wooded. A more detailed description of the site is available in the related planning documentation that has been prepared in support of the planning process for the proposed new quarry development.

2.2 The Study Area

The study site lies just south of the Town of Bancroft, west of Highway 62. The surrounding area supports some limited agricultural uses but is primarily comprised of small lakes, woodlots and recreational properties. This section of the Highway 62 corridor contains some highway commercial development characteristic of outlying areas in the smaller towns in this part of Ontario. These uses include franchise home improvement/building centres, lumber yards, gas stations and other related uses. In support of these uses, Highway 62 has a posted speed of 70 kph in the immediate vicinity of the Bay Lake Road intersection.

The immediate area around the study site, along the Bay Lake Road corridor is primarily wooded but also includes rural residential and recreational land uses. It will be noted that there are two rural residences located on Bay Lake Road between the south site entrance and Highway 62.

2.3 The Haul Route

2.3.1 Overview

The following proposed haul route will form the primary travel route for trucks travelling to/from the proposed quarry site. Future site traffic will exit/enter the site via the main south site entrance located about 350 m south of Highway 62. From here the quarry traffic will travel north along Bay

Lake Road to an existing intersection with Highway 62. At this point the traffic will travel north or south to connect to the following markets:

- North – towards both the Town of Bancroft to Highway 62 north and the Highway 28 corridor to markets east and west of the town.
- South – serving markets along Highway 62 south towards Madoc and the Highway 7 corridor.

The Highway 62 intersection with Bay Lake Road may be considered a "T" intersection in terms of the municipal and highway approaches. However, for the purposes of the study analyses, the *Rona* entrance has been considered as a fourth east approach. The Bay Lake Road intersection with the *Rona* entrance is illustrated in *Exhibit 3 – Study Intersections*.

2.3.2 Bay Lake Road

Within the immediate study area, Bay Lake Road is under the joint jurisdiction of the Township of Faraday and the Town of Bancroft. Bay Lake Road is a rural collector road that runs in a loop to the west of the Highway 62 corridor. It provides access to recreational properties and permanent residences west of Highway 62. It rejoins Highway 62 several kilometres to the south at the Village of L'Amable. In the vicinity of the south site entrance it is aligned in a north-south direction. It has a 6.4 m all-weather surface with 0.7 - 1.0 m gravel shoulders. In reviewing *Exhibit 3* it is noted that there is a short radius turn in the alignment located just south of the Bay Lake Road approach to Highway 62. A copy of a *Road Appraisal Sheet* for this section of Bay Lake Road was provided by the Township. This copy is included in the *Technical Appendix – Traffic Data*.

2.3.3 Highway 62

Highway 62 is normally under the jurisdiction of the Ministry of Transportation Ontario. However, within the immediate study area it is a "Connecting Link" and is under the jurisdiction of the Town of Bancroft. Highway 62 serves as a major rural arterial road connecting the Town of Bancroft (to the north) to communities to the south and the Highway 7 TransCanada corridor. Further south it connects to Highway 401 and Belleville, the County seat.

In the vicinity of the study site Highway 62 is generally aligned in a north-south direction; however, in the immediate study area, it is aligned in a northwest-southeast direction. It has a two-lane, two-way rural cross-section with a pavement width of 8.2 - 8.4 m including partial paved shoulders and 2.8 m gravel shoulders. There is localized widening at the intersection with Bay Lake Road. The posted speed limit in the vicinity of the study area is 70 km/h. The 70 kph posted speed extends for about 220 m south of the Bay Lake Road intersection. At this point the posted speed changes to 80 kph.

2.3.4 Highway 62 – Bay Lake Road Intersection

This is the main study intersection of the haul route. The original skewed angle of intersection of Bay Lake Road and Highway 62 has been reconstructed to form a 90 degree intersection. The

result is a short radius turn in the Bay Lake Road approach. This tends to reduce the speed of traffic that has exited Highway 62 and is travelling south on Bay Lake Road. Sight distances from Bay Lake Road along the Highway 62 corridor exceed the MTO requirement of 200 m for a design speed of 90 km/h.

The existing lane configuration at this intersection was documented during the field review and is described as follows:

- Northbound Highway 62: one shared through-left turn lane;
- Southbound Highway 62: one shared through-right turn lane;
- Eastbound Bay Lake Road: one shared left-right turn lane with a flared approach at the stop bar.

During the field review the following intersection characteristics were noted:

- A community mail box located in the north side of Bay Lake Road just west of the intersection. The parking area around the mail boxes appears sufficient. As described above, speeds on this section of Bay Lake Road are low.
- Two commercial driveways on the east side of Highway 62 located in close proximity to the intersection including:
    - An access to *Jan Woodlands Inc*. lumber mill to the north
    - A franchise *Rona* store to the south. During the July, 2015 traffic counts it was noted there the north access to the Rona store functioned as an east (fourth) approach to the Bay Lake Road intersection. These volumes were counted and applied to the intersection capacity analyses for the Bay Lake Road intersection.

2.3.5 The Proposed Site Access

The *South Site Entrance* will be used as the principal access to the new quarry operation. This entrance is located about 350 m south of the Bay Lake Road intersection with Highway 62 (see *Exhibit 3*). This entrance serves as the main site entrance to the lumber mill and the Class B gravel pit located on-site. The entrance with its present geometrics has been in use for a number of years. As part of the 2012 traffic study, a site visit was carried out on Friday June 22, 2012 to assess traffic operations at the south entrance. A mix of traffic was observed accessing/departing the mill during this site visit. This mix included large tractor trailers, smaller trucks and pickup trucks assumed to be on business/service calls or making retail purchases. There are two parking areas in the immediate vicinity of the entrance. One is on the west side of Bay Lake Road just north of the entrance the other opposite the entrance on the east side of Bay Lake Road. Both lots were about 75% full with what is assumed to be employee vehicles parked for the day.

Traffic counts and observations were collected at the *South Site Entrance* as part of the July, 2015 traffic data collection program. The 2015 observations were consistent with the conditions noted in the 2012 site entrance survey.

A spot speed study was carried on Bay Lake Road at the *South Site Entrance* on July 22, 2015 as part of the traffic data collection program. An initial speed study had been carried out in 2012 using the "floating car" approach. This method produces speed estimates that are more typical of average speeds in the corridor. The 2015 speed study was carried out using a calibrated radar unit designed to collect traffic speed data. Fifteen observations were taken on each direction. The 85th percentile speed for northbound traffic was found to be 56 kph. The 85th percentile traffic for south bound traffic was 68 kph. This speeds represent speeds that equal to or less than speeds travelled by 85% of the traffic, i.e., only 15% of the traffic was travelling faster. These speeds are somewhat higher than quoted in the 2012 reporting, but, as noted above, the 2012 speeds represented more average travel speeds.

Sight lines at the *South Site Entrance* were measured as part of the June 22, 2012 field assessment. These sight distances were re-measured in July, 2015 to confirm the original 2012 findings. The sight distances were measured following current MTO standards and criteria for defining a site entrance turning sight distance (TSD)[2]. There is about 90 - 93 m of sight distance to the south of the proposed entrance. This sight line is restricted by a crest vertical curve in Bay Lake Road. To the north the sight distance exceeds 210 m.

These sight lines were reviewed against standards contained in the MTO's *Geometric Design Standards for Ontario Highways* (GDSOH) manual. Sight distance to the south was assessed against the observed 56 kph, 85th percentile operating speed of the northbound traffic approaching from the south. The available sight distance is just over 90 m. The MTO recommended *Stopping Sight Distance* (SSD) for 55 kph is 75 m. The available 90 m sight distance exceeds the minimum SSD. Based on *Faraday Township Road Needs Study* data (see *Technical Appendix – Traffic Data*) the planned/posted speed for this section of Bay Lake Road is 60 kph. The SSD for 60 kph is 85 m. The available SSD of 90 m to the south of the entrance exceeds this minimum requirement. There is over 200 m of TSD from the south site entrance to the north.

2.4 Traffic Data

The intersection traffic count data for the original 2012 traffic study was collected in early March, 2012. It was subsequently factored up based on MTO seasonal adjustment data to representative 2012 summer peak hour volumes. Timing of the 2015 update traffic study allowed the direct collection of 2015 summer peak period traffic counts during July, 2015. Summer weekday peak period traffic counts were collected at the Bay Lake Road intersection with Highway 62 and at the south site entrance to Bay Lake Road. The *South Site Entrance* counts provided current site trip generation volumes at the *Freymond Lumber Ltd*. site. Since the counts were collected during the peak summer months, no seasonal adjustments were made to the observed counts.

[2] See *Visibility* pg. 2, Commercial Site Access Policy and Standard Designs, MTO pub. 1994

The Ministry of Transportation daily traffic volume data was extracted from the ministry web site for the section of Highway 62 immediately south of the Bay Lake Road intersection. These data included volumes from 1988 to 2010 inclusive. A copy of these daily volume data are included in the *Technical Appendix – Traffic Data*. This ministry traffic data provided information on the overall growth patterns of traffic in the Highway 62 corridor. Highway 62 approaching Bancroft has an MTO LT (low tourist) classification. This classification is consistent with the recreational and supporting commercial development in Bancroft and the surrounding area. A summary of the observed July, 2015 summer weekday peak hour volumes as applied to the traffic analysis is contained in *Exhibit 4 – 2015 Summer Peak Hour Volumes*.

The volume of truck traffic presently travelling to/from the study site was a potential concern raised in the June, 2015 public meeting. During the July, 2015 traffic counts, trucks were counted as a subtotal of the total site traffic at the site entrance. A separate count was carried out of both "medium" and "heavy" trucks. These truck volumes are also identified in *Exhibit 4*.

2.5 Intersection Capacity Analyses

Intersection capacity analyses were carried out for the Highway 62/Bay Lake Road intersection based on the July, 2015 summer traffic volumes. The analyses procedures followed the methodology contained in the *Transportation Research Board's Highway Capacity Manual* (HCM) 2010 for unsignalized intersections and was carried out using *Trafficware's Synchro 8* software. The following *Table 1* summarizes the results of the analyses for both weekday peak hour periods. For the purposes of the intersection capacity analyses it has been assumed that Bay Lake Road runs north/south and Highway 62 runs east/west. A peak hour factor (phf) of 0.80 was applied to capacity analyses traffic movements rather than the default value of O.92. This lower phf was used to better represent the peaking of traffic demands from employees travelling to/from the lumber mill within the peak hour period.

The default 2% truck volume in the Synchro analyses was revised to correspond to the observed percentage of trucks in the traffic stream (see *Exhibit 4*)

In reviewing *Table 1* it is noted that the two study intersections operate a very good LoS during summer weekday peak hour periods. There is considerable residual capacity for future growth in traffic. Drivers on the minor STOP-controlled approaches of the intersections face little delay. In the case of the Site Entrance intersection with Bay Lake Road, all observed approach volumes were less than 30 vehicles per hour (vph). On the average over the peak hour period, this is less than 1 vehicle every two minutes. More detailed summary printouts of the capacity analyses are provided in the *Technical Appendix – Intersection Capacity Analyses*.

Table 1: 2015 Summer Intersection Capacity Analysis Summary

July Weekday Peak Hour Periods (unsignalized)				
	AM Peak Hour – Critical Movement		PM Peak Hour – Critical Movement	
	LOS (Delay)	V/C	LOS (Delay)	V/C
Hw62/Bay Lk Rd	NB LTR: **B** (12.4s)	0.09	NB LTR: **B/C** (15.8s)	0.16
Site Ent/Bay Lk Rd	EB LTR: **A/B** (9.7s)	0.02	EB LTR: **A/B** (9.9s)	0.04

3. THE DEVELOPMENT

This chapter describes the existing site, proposed changes to the buildings/operations, and the development of the site generated traffic.

3.1 Overview

The study site is located in the Township of Faraday just south of the Town of Bancroft, Ontario. The site itself is located on part of Lots 51 and 52, Concession W.H.R. in the Township of Faraday. The *Freymond Lumber Ltd*. lumber mill lies along the south boundary of the proposed quarry. The layout of the mill facilities and location of the proposed quarry are illustrated in *Exhibit 2.* The quarry will be developed in separate phases as illustrated in the exhibit. When excavation is completed in one phase the next phase will become operational.

The south entrance is the main access point into the mill and presently accommodates all external site traffic. The current 2015 site-generated traffic was observed as part of the July, 2015 traffic count program. Counts at the site entrance provided the current weekday peak period site trip generation data. It will be noted that the counts also included volumes of traffic travelling to/from the employee parking area on the east side of Bay Lake Road. The current site trip generation is summarized in *Table 2 – Site Trip Generation* following:

3.2 Future Site Trip Generation

The principal operation in the new quarry will be the extraction of aggregates. This material will be crushed on-site and transported in a range of truck sizes from dual axle dump trucks to large belly-dump tractor/trailer combination vehicles. The material is expected to be sold primarily into the local market with some production aimed at the forestry industry.

For the purposes of quarry trip generation, it has been assumed that shipping of aggregate will occur from Monday to Friday between 6:00 AM and 7:00 PM. There will be limited shipments during the winter months for such things as road maintenance operations.

These daily start/end times mean employee trips and truck trips will arrive on site before the normal AM peak hour and depart after the usual PM peak hour. However, the analyses in this report assumes that a worst case condition occurs when the peak site traffic coincides with the peak background traffic on adjacent roadways.

Based on the following assumptions the quarry can extract up to 300,000 T per year:

- Crushed material will be loaded by one experienced loader operator loading on average 20 – 25 T of material per truck. It assumed that the average load will be 20 T. The size of the truck will vary. If the trucks are larger, the loading rate/truck will be longer and the truck volumes will be less.
- There will be an available stockpile of material for the loader. This can sometimes require a second loader to maintain the stockpile.

- One experienced operator can load one truck in 5 minutes
- Average hourly loading rate will be 10 trucks per hour
- The loading operations will run for 10 hours per day 5 days per week
- Weekly production = 20 T/truck (worst case) x 10 trucks/hr x 10 hr/da x 5 da/wk = 10,000 T/wk
- Full extraction operations will run from early May until early Nov for about 28 weeks for a total extraction of 280,000 T.
- For the remaining 24 weeks, it is assumed that there will be 18 operational weeks due to holidays and weather. The extraction rate will have to average about 1,200 T/week ie about 240 T/day or about 10 - 11 trucks per day or 1 or 2 trucks per hour.

The peak site trip generation coinciding with peak background traffic will occur during a summer weekday. At this time it is assumed that new site traffic will have the following components:

- 10 inbound truck trips and 10 outbound truck trips
- 4 employees from the quarry operation arriving/leaving work
- 1 service vehicle (fuel, repairs, UPS delivery etc.)

Based on these assumptions the new quarry peak hour site trip generation is summarized in *Table 2* below.

Table 2: Future Site Trip Generation (vph)

	AM Peak Hour			PM Peak Hour		
	In	**Out**	**Total**	**In**	**Out**	**Total**
Employee Trips	4	1	5	1	4	5
Truck Trips	10	10	20	10	10	20
Service Trips[A]	1	1	2	1	1	2
New Trips	**15**	**12**	**27**	**12**	**15**	**27**
Freymond Lumbr	7	11	18	9	24	33
Total Site T G	**22**	**23**	**45**	**21**	**39**	**60**

A – The service trips were assumed to be split between inbound and outbound during the AM and PM peak hours.

In reviewing *Table 2* it will be noted that the future *Freymond Lumber* site trip generation has been assumed to grow from the observed 2015 levels (see *Exhibit 4*). The 2015 site trip generation has been expanded at the rate of 2% per year (compounded) over the 10 year planning horizon to produce the forecast 2025 peak hour volumes. As a worst case scenario this expanded current site trip generation was applied to both the 2020 and 2025 total traffic forecasts (see *Section 4*).

There is presently a small pit adjacent to the proposed quarry. The pit can only ship a maximum of 20,000 T per year. Most of this aggregate is delivered to the forestry industry during the winter months for sanding logging roads. Since the pit is mainly in use during the winter months and has a limited tonnage limit, it has not been included in the site trip generation forecasts.

3.3 Site Trip Distribution

The distribution and assignment of future quarry traffic will be based on the location of the trip destinations for the quarry products and location of the employee base. The anticipated location of the future work force and customers for the quarry aggregates were reviewed with the proponent. This information was supplemented with the observed directional distribution of trips at the Bay Lake Road intersection with Highway 62.

It was assumed that all site-generated trips will follow the haul route along Bay Lake Road to Highway 62. At that point, trips will either travel north or south on Highway 62. The observed distribution of Bay Lake Road traffic to/from Highway 62 was between 70% and 80% to the north with the exception of the AM peak hour when inbound traffic to Bay Lake Road was 63% from the north. Based on this observed trip distribution, and information supplied by the proponent, the following directional splits were applied to the truck trips and the employee trips for the 2020 and 2025 planning scenarios:

- Employee Trips:
    - North on Highway 62: 60%
    - South on Highway 62: 40%
- Truck Trips:
    - North on Highway 62: 50%
    - South on Highway 62: 50%

Based on these assumptions separate assignments were carried out for employees and truck traffic. The two assignments were then aggregated to get a total assignment of site traffic to adjacent roads and intersections.

The assumed distribution of travel to/from the south may over-state this movement given the proximity of the Town and the Highway 28 corridor to the north. However, this assumed higher level demand of site traffic to/from the south will produce a more conservative forecast in northbound left turns at the Bay Lake Road intersection. This in turn will produce higher traffic demands in evaluating the warrants for a northbound left turn lane on Highway 62 at the intersection with Bay Lake Road.

4. FUTURE CONDITIONS

This chapter summarizes the assumptions used to develop future year traffic volumes, the operational analysis results and associated impacts to the transportation infrastructure.

4.1 Future Summer Background Traffic

As described in *Section 3*, two future planning horizons have been developed to evaluate quarry traffic impacts on Bay Lake Road and Highway 62. The first planning horizon, 2020 covers a 5 year time span as a base future scenario. The 2020 planning horizon allows for a year of planning approvals and site development and then four years of growth in site and background traffic. The study has also considered potential longer term impacts from full site development and additional growth in background traffic that might occur over the next 10 years to 2025.

The forecast of future background traffic volumes was based on data developed from a review of traffic growth in the Highway 62 corridor. Historic MTO daily traffic volume data were available for the years 1988 to 2010 inclusive. The overall growth in daily traffic volumes was charted to assess patterns and trends. A copy of the daily volume data and the chart of these data are included in the *Technical Appendix – Traffic Data*. In reviewing the charted data it was noted that there has been relatively uniform growth in daily volumes from 2001 to 2010, that last available year for daily volume data. The rate of growth has been running at around 2% per year compounded. For the purposes of this study it has been assumed that future traffic volumes will grow at the rate of 2% per year (compounded). This rate of growth was used to expand the 2015 summer background traffic to both the 2020 and 2025 summer background traffic volumes.

No roadway network changes were identified for the study area roads. All other developments in the vicinity of the proposed site that could occur by the 2020 and 2025 planning horizons were considered to be accounted for in the 2% per year (compounded) traffic growth rate.

4.2 Future Summer Total Traffic

The total traffic volumes for each of the two planning horizons were computed as follows:

- 2020 Scenario 1 - AM and PM Peak Hours:
  - Observed July, 2015 traffic volumes increased by;
  - A compounding 2% per annum growth factor from 2015 to 2020; plus
  - Future site traffic as described in Section 3.2, *Table 2*.
- 2025 Scenario 2 - AM and PM Peak Hours:
  - Observed July, 2015 traffic volumes increased by;
  - A compounding 2% per annum growth factor from 2015 to 2025; plus
  - Future site traffic as described in Section 3.2, *Table 2*.

The forecast total traffic volumes for the two scenarios are illustrated in *Exhibit 5 – 2020 Total Peak Hour Volumes* and *Exhibit 6 – 2025 Total Peak Hour Volumes*. In reviewing the exhibits it will be noted that the site traffic volumes are identified in each of the intersection turning movements.

4.3 Future Conditions - Capacity Analysis

4.3.1 2020 Planning Horizon

Capacity analyses were carried out for each of the study intersections using the 2020 total forecast traffic volumes. The analysis procedure followed the *Transportation Research Board's Highway Capacity Manual* (HCM) methodology for unsignalized intersections. The software tool applied was Trafficware's *Synchro 8*. The following *Table 3* summarizes the results for the AM and PM peak hours for summer 2015, 2020 background and 2020 Scenario 1 total traffic conditions. For the purposes of intersection description this section of Highway 62 is considered to run east/west.

Table 3: Summary of 2020 Intersection Capacity Analysis Results

Highway 62/Bay Lake Road (unsignalized)				
	AM Peak Hour – Critical Movement		**PM Peak Hour – Critical Movement**	
	LOS (Delay)	**V/C**	**LOS (Delay)**	**V/C**
2015 Summer	NB LTR: **B** (12.4s)	0.09	NB LTR: **B/C** (15.8s)	0.16
2020 Background	NB LTR: **B** (13.1s)	0.10	NB LTR: **C** (17.3s)	0.19
2020 Scenario 1 Total	NB LTR: **B** (13.5s)	0.14	NB LTR: **C** (18.1s)	0.24

Site Entrance/Bay Lake Road (unsignalized)				
	AM Peak Hour – Critical Movement		**PM Peak Hour – Critical Movement**	
	LOS (Delay)	**V/C**	**LOS (Delay)**	**V/C**
2015 Summer	EB LTR: **A/B** (9.7s)	0.02	EB LTR: **A/B** (9.9s)	0.04
2020 Background	EB LTR: **A/B** (9.8s)	0.02	EB LTR: **A/B** (10.0s)	0.04
2020 Scenario 1 Total	EB LTR: **A/B** (10.0s)	0.04	EB LTR: **A/B** (10.3s)	0.07

The operational analyses of the future 2020 traffic scenarios indicate that all of the movements at the study intersections will operate at acceptable levels of service (LoS) C or better and volume-to-capacity (v/c) ratios 0.24 or better. Drivers accessing Highway 62 from Bay Lake Road will face acceptable levels of delay. There will be considerable amounts of residual capacity for future growth in traffic. A detailed summary of the 2020 capacity analysis results is provided in the *Technical Appendix – Intersection Capacity Analyses*.

4.3.2 2025 Planning Horizon

An analysis of the two study area intersections was carried out assuming the maximum level of site development that might occur over a longer planning period to 2025 (Scenario 2). The analysis procedure followed the methodology contained in the *Transportation Research Board's Highway Capacity Manual* (HCM) 2010 for unsignalized intersections. *Table 5* following summarizes the results of the analyses for both weekday peak hour periods.

Table 4: Summary of 2025 Intersection Capacity Analysis Results

Highway 62/Bay Lake Road (unsignalized)				
	AM Peak Hour – Critical Movement		**PM Peak Hour – Critical Movement**	
	LOS (Delay)	**V/C**	**LOS (Delay)**	**V/C**
2015 Summer	NB LTR: **B** (12.4s)	0.09	NB LTR: **B/C** (15.8s)	0.16
2025 Background	NB LTR: **B/C** (14.0s)	0.12	NB LTR: **C** (19.6s)	0.24
2025 Scenario 2 Total	NB LTR: **B/C** (14.4s)	0.16	NB LTR: **C** (20.8s)	0.30

Site Entrance/Bay Lake Road (unsignalized)				
	AM Peak Hour – Critical Movement		**PM Peak Hour – Critical Movement**	
	LOS (Delay)	**V/C**	**LOS (Delay)**	**V/C**
2015 Summer	EB LTR: **A/B** (9.7s)	0.02	EB LTR: **A/B** (9.9s)	0.04
2025 Background	EB LTR: **A/B** (9.9s)	0.02	EB LTR: **A/B** (10.1s)	0.04
2025 Scenario 1 Total	EB LTR: **A/B** (10.1s)	0.04	EB LTR: **A/B** (10.3s)	0.07

The 2025 capacity analyses for Scenario 2 shows that all of the movements at the study intersections will operate at acceptable LoS "C" or better and volume-to-capacity (v/c) ratios 0.30 or better. Future peak hour site traffic will have relatively little impact on 2025 traffic conditions. In reviewing *Table* 5 it will be noted that with the addition of site traffic, the maximum increase in average delay for the critical intersection movements will be 1 second or less. Drivers accessing Highway 62 from Bay Lake Road are forecast to have acceptable levels of delay averaging about 21 seconds. A detailed summary of the 2020 capacity analysis results is provided in the *Technical Appendix – Intersection Capacity Analyses*.

4.4 Auxiliary Lane Analyses – Highway 62/Bay Lake Road

4.4.1 Left Turn Lane Analyses

Left turn lane warrant analyses were carried out for the Highway 62/Bay Lake Road intersection to determine the need for either a northbound or southbound left turn lane on Highway 62 at the

Bay Lake Road intersection. The analyses were completed for the *Scenario 2,* 2025 total peak hour volumes as illustrated in *Exhibit 6*.

The assessment was done using the methodology and criteria for left turn lane warrants as contained in the Ontario Ministry of Transportation's (MTO) *Geometric Design Standards for Ontario Highways* (GDSOH) document. The warrant assessment is normally carried out for 20 kph over posted speed, 90 kph. However, given the proximity to the 80 kph posted speed south of Bay Lake Road, as a worst case scenario, the assessment was based on a 100 kph design speed. No warrant was found for either a northbound left turn lane to Bay Lake Road or southbound left turn lane to serve the *Ron*a entrance. The MTO warrant nomographs used for the analyses are contained in the *Technical Appendix – Auxiliary Lane Warrant Analyses*.

4.4.2 Right Turn Lane Analysis

There is presently a partial paved shoulder on the southbound west side of Highway 62. This is supported with an additional 20 m partial taper on the approach to the Bay Lake Road intersection. A review of the southbound Highway 62 approach to Bay Lake Road was carried out to determine the need for a right turn taper/lane in the southbound direction. The Bancroft Connecting Link portion of Highway 62 is really part of the overall Highway 62 corridor. So the right turn taper/lane criteria contained in the *Geometric Design Standards for Ontario Highways* (GDSOH) document were applied to this assessment.

The peak 2025 southbound right turn volume forecast for this movement is 44 vph. Given this relatively low volume and the good LoS forecast for the Highway 62/Bay Lake Road intersection, improving the existing southbound right turn taper to bring it up to current MTO standards should be sufficient. *Figure E7-2* in the GDSOH provides a guideline for the general layout of the taper improvement. *Table E7-1* provides recommended taper lengths for various design speeds. Based on this table the southbound right turn taper should be 75-80 m in length. It should be noted that the need for this improvement will be driven by the volume of background traffic as well as new site traffic. It is noted that the current Transportation Association of Canada (TAC) standards for this right turn design are similar. These standards can be found in the TAC publication, *Geometric Design Guide for Canadian Roads, Figure 2.3.5.1* and *2.3.5.2*.

4.5 The South Site Entrance to Bay Lake Road

The existing *South Site Entrance* to Bay Lake Road will provide access to the new quarry. The capacity analyses has determined that the lane configuration at the existing intersection with single lane approaches will accommodate future site and background traffic. The recommended geometrics for the site entrance intersection with Bay Lake Road are:

- Northbound Bay Lake Road a shared through/left turn lane
- Southbound Bay Lake Road a shared through/right turn lane

- Eastbound site entrance, one outbound lane for shared left, through (to the parking lot) and right turns.
- Westbound site entrance, one inbound lane
- Appropriate inbound and outbound radii on the site entrance to accommodate all existing and future site traffic.

Since the 2025 forecast approach volumes are all less than 60 vph, no auxiliary left turn lanes or right turn lanes will be required at the site entrance intersection.

With the planned utilization of the *South Site Entrance* for access to the new quarry, future quarry traffic will be sharing the internal site circulation roads with existing Lumber Mill traffic. In developing the design of the future internal road network, consideration should be given to the safe on-site routing for the two sources of future site traffic.

5. CONCLUSIONS AND RECOMMENDATIONS

This chapter summarizes the salient findings of the analysis and identifies any necessary changes to the transportation infrastructure.

5.1 Conclusions

The following conclusions have been drawn from the traffic impact analyses completed for the proposed quarry:

- The intersection capacity analyses show that there are presently no operational issues at the two study intersections. All of the intersection turning movements operate at good LoS with relatively low volume to capacity (v/c) ratios during current peak hour periods.
- The two study intersections are forecast to operate at good LoS during summer peak hour periods for 2020 and 2025 traffic scenarios assumed in the study analyses. There will be residual capacity for additional growth in site and background traffic beyond the 2025 planning horizon assumed in these analyses.
- During periods of peak quarry production of 300,000 tonnes per year, the new quarry will generate up to 27 two-way trips during summer weekday peak hour periods.
- Access to the proposed site will be via the existing *South Site Entrance* to the *Freymond Lumber Ltd.* property. This entrance presently accommodates existing site traffic. Available turning sight distance (TSD) at the *South Site Entrance* to the south along Bay Lake Road meet current MTO stopping sight distance requirements for 60 kph. TSD to the north along Bay Lake Road exceeds MTO TSD requirements.
- Based on MTO standards, a southbound right turn direct taper should be constructed on the west side of the Highway 62 approach to Bay Lake Road. This will accommodate southbound right turns from Highway 62 to Bay Lake Road.

5.2 Recommendations

The following recommendations have been developed from the study analyses and conclusions:

- That the existing southbound right turn taper at the Highway 62/Bay Lake Road intersection be upgraded to 75-80 m to meet current MTO standards for Highway 62.
- That a *Truck Entrance Sign* (Wc-8L) be installed on the east side of Bay Lake Road at an appropriate location south of the south site entrance.
- The capacity analyses has identified that the existing *South Site Entrance* configuration with one inbound lane and one outbound lane will accommodate future site traffic. Both the inbound and outbound lanes will require appropriate turning radii to accommodate trucks entering and exiting the site.
- All signage and pavement markings be constructed in accordance with the guidance provided in the *Ontario Traffic Manual* (OTM) and *the Manual of Uniform Traffic Control Devices of Canada* (MUTCDC).

In summary, the future traffic generated by the *Freymond Quarry* can be accommodated by adjacent roads and intersections. The *South Site Entrance* with one inbound lane and one outbound lane with appropriate turning radii will provide good access to the study site. No further new road infrastructure will be required to support the proposed *Freymond Quarry*.

REPORT EXHIBITS

Exhibit 1
Key Map

Source: Google Maps

Exhibit 2
Operation Plan - DRAFT
(Schematic)

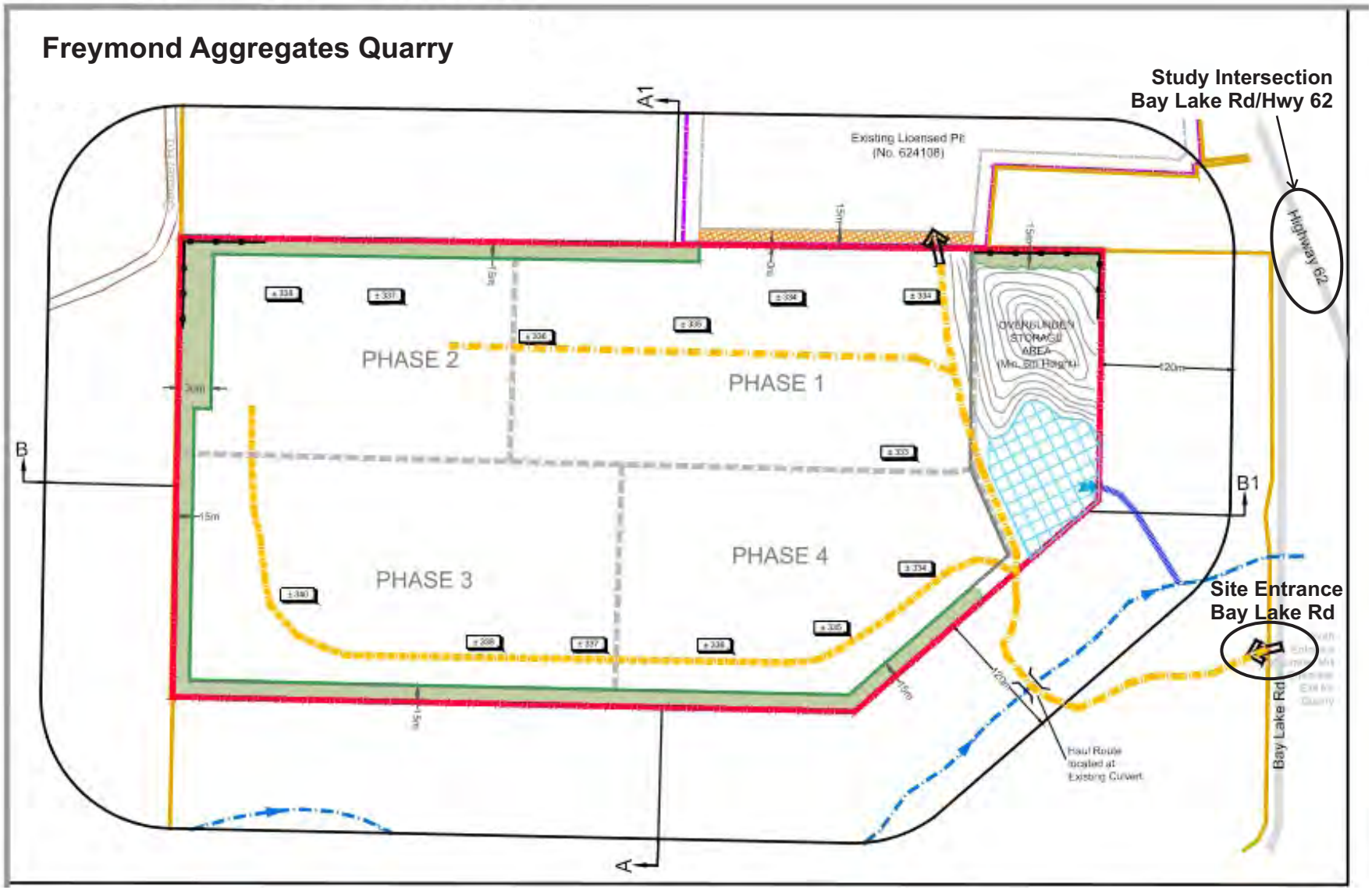
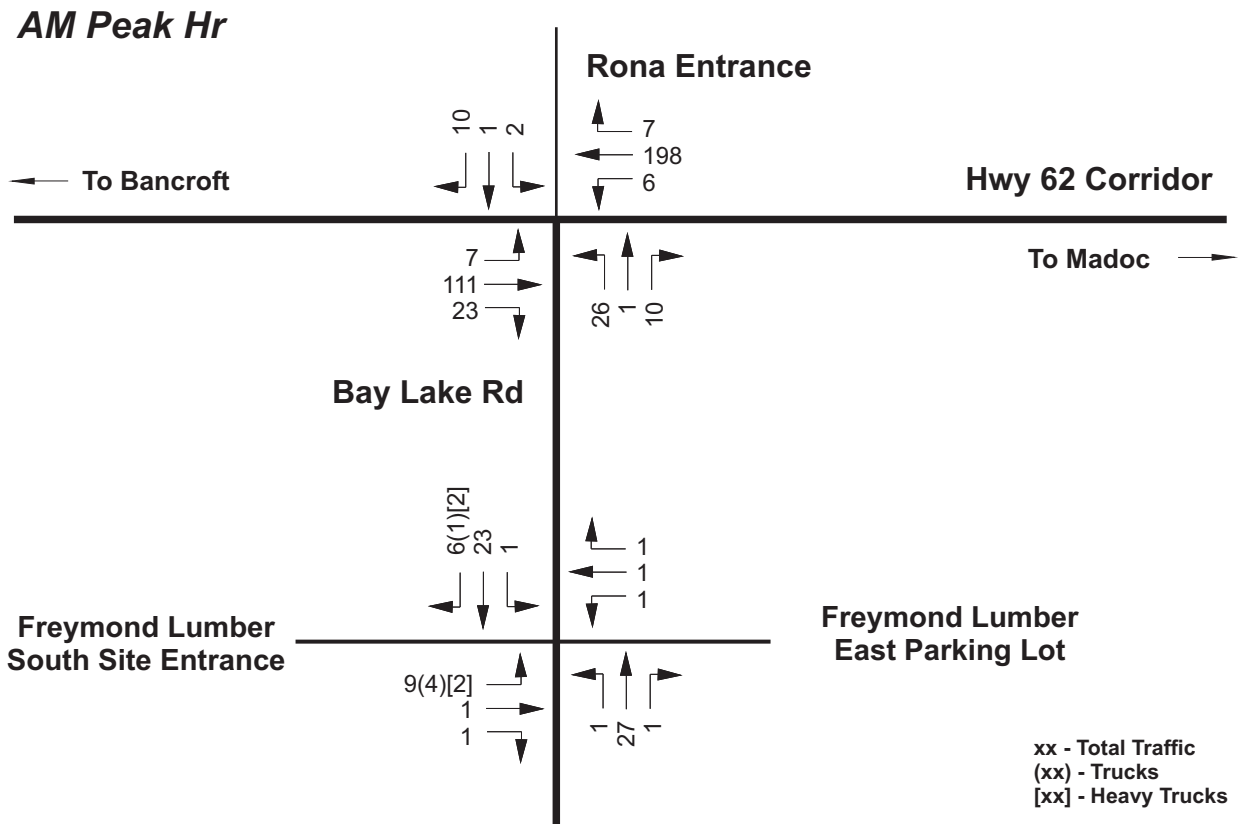


Exhibit 3
Study Intersections

South Site Entrance

Highway 62 at Bay Lake Road

Exhibit 4
2015 Summer Pk Hr Volumes



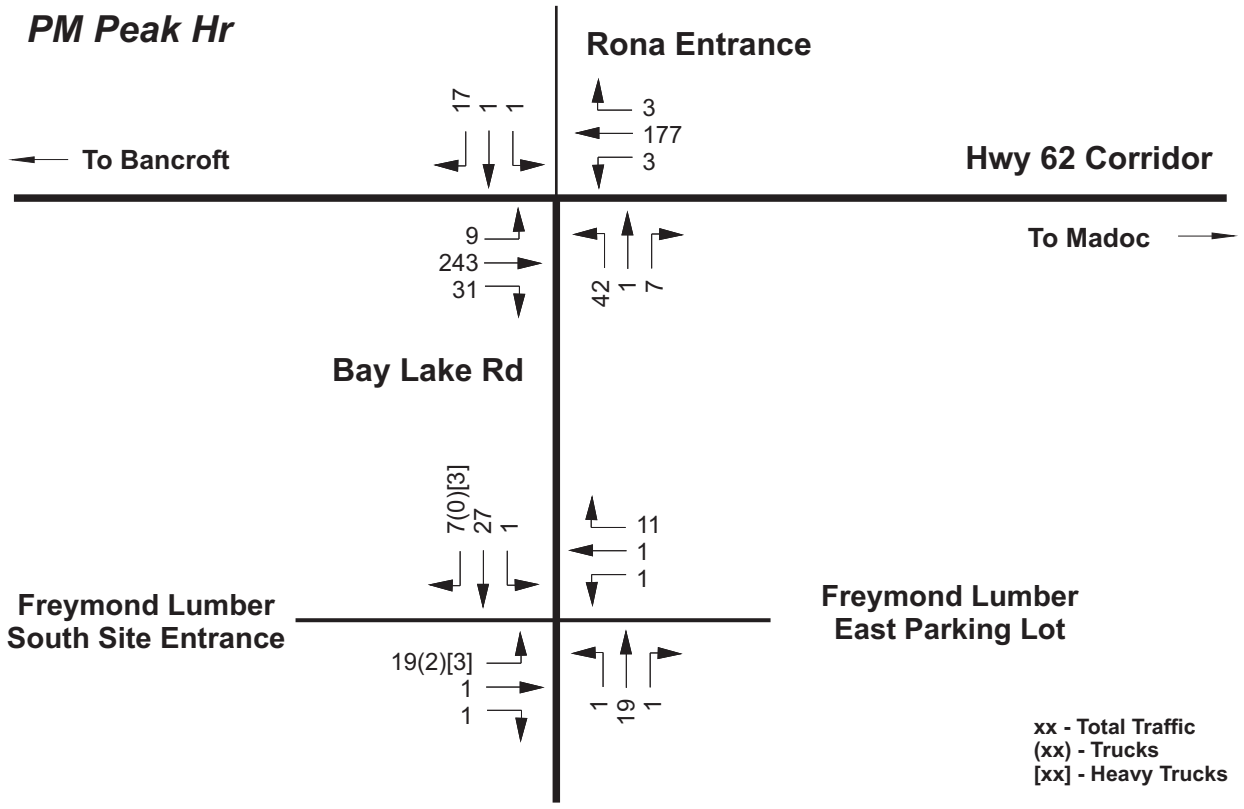
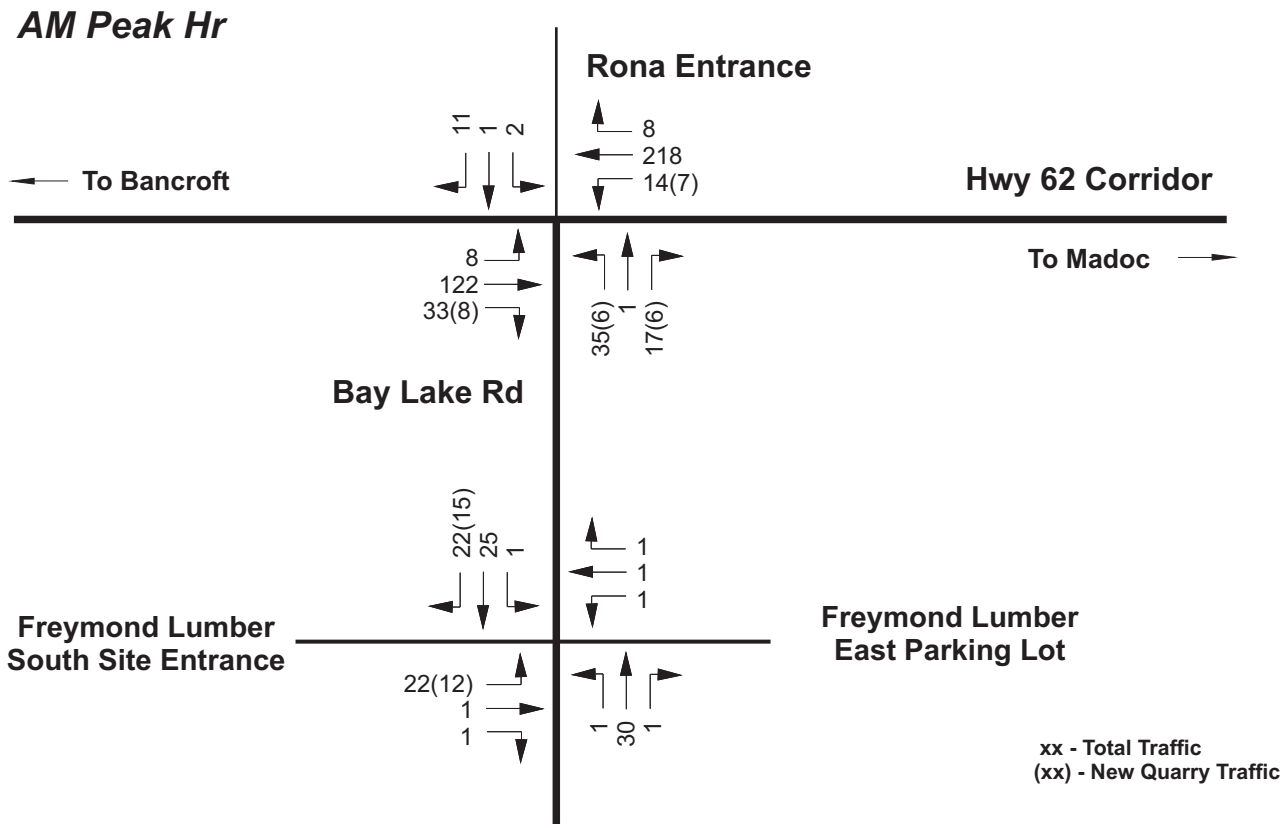


Exhibit 5
2020 Total Peak Hr Volumes



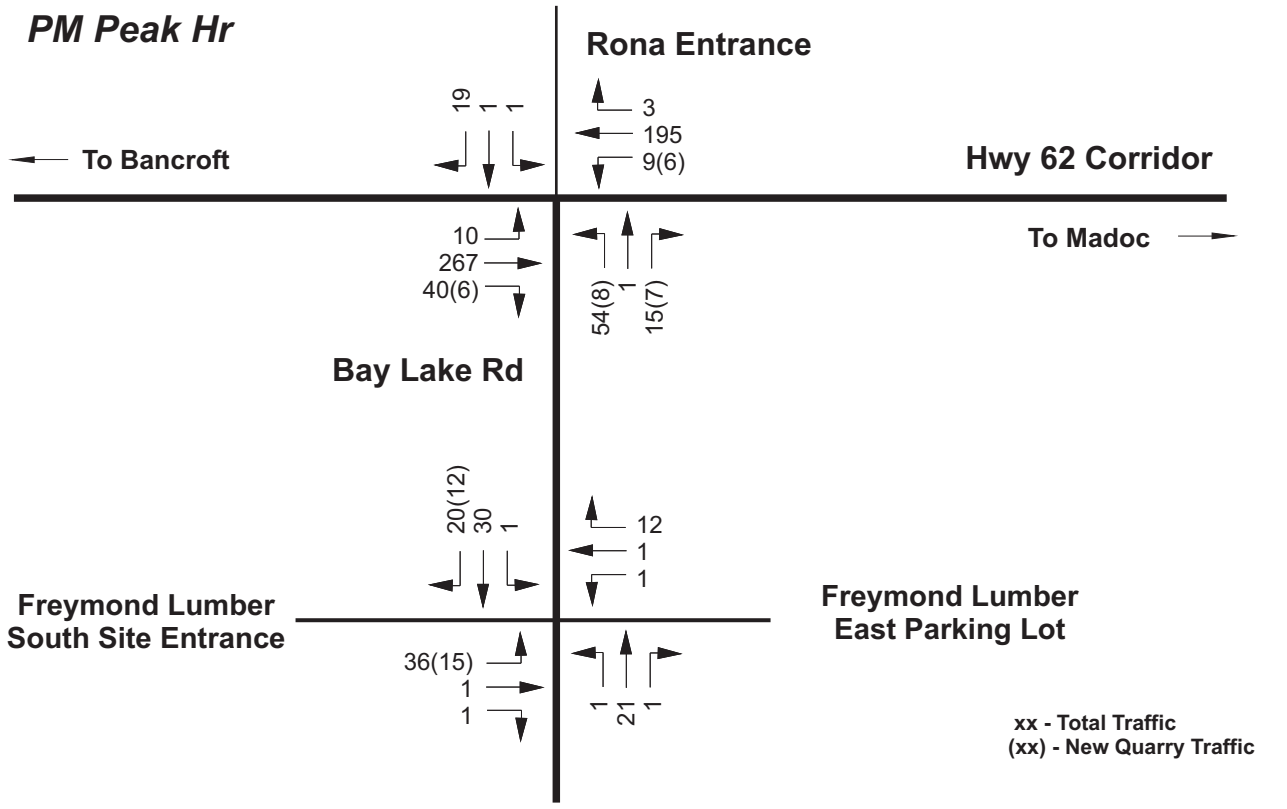
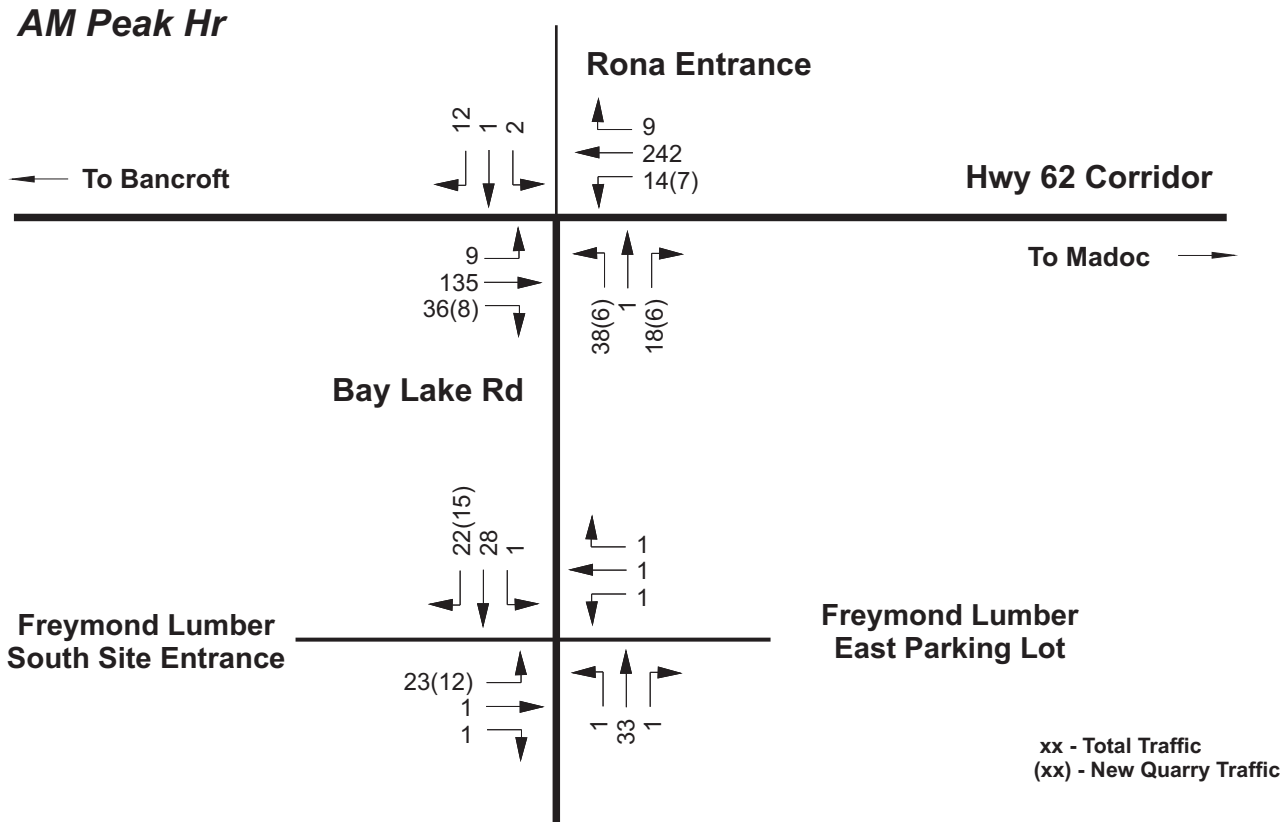
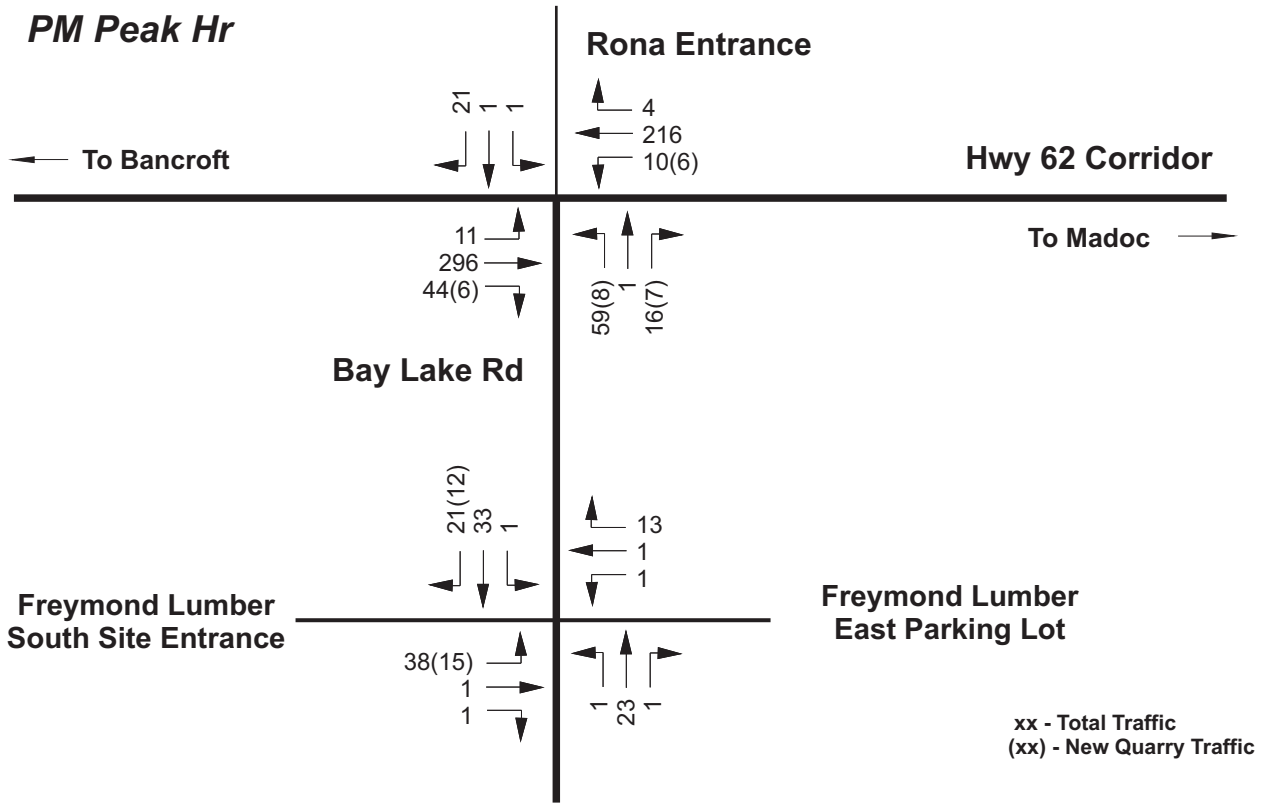


Exhibit 6
2025 Total Peak Hr Volumes





TECHNICAL APPENDIX

Intersection Capacity Analyses

DEFINITION OF LEVELS OF SERVICE
Automobile Mode

UNSIGNALIZED INTERSECTIONS

Analysis of the Level of Service for unsignalized intersections is based on the ***Highway Capacity Manual*** *(HCM 2010)* procedures using current software for unsignalized intersections. The Level of Service for intersections is based on *Control Delay*. At two way stop controlled intersections (TWSC), *Control Delay* is the total elapsed time from a vehicle joining the queue until its departure from the stopped position at the head of the queue. The *Control Delay* also includes the time required to decelerate from a stop and to accelerate to the free-flow speed.

The analysis of individual movements at TWSC intersections can also include the estimate of the ratio of volume or demand to available capacity for the movements. This is commonly know as the (v/c) ratio. The v/c ratio provides some indication of how well these individual intersection movements will function during peak hour periods.

Level of Service definitions for unsignalized intersections as defined by the ***Highway Capacity Manual*** are summarized in the table below.

Definition of Level of Service for Unsignalized Intersections
(see Exhibit 19-1, Highway Capacity Manual 2010)

Level of Service	Average Delay (seconds)
A	0 - 10
B	>10-15
C	>15-25
D	>25-35
E	>35-50
F	More than 50s and/or v/c > 1

Level of Service (LoS) for a TWSC intersection is determined by the computed or measured *Control Delay* and is defined for each minor movement at the intersection. LoS is not defined for the major street approaches or the intersection as a whole. LoS “F” is considered to be undesirable for design or planning purposes. However, many individual turning movements at TWSC intersections and commercial entrances along urban arterial corridors operate at LoS “F” during peak hour periods.

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	7	111	23	6	198	7	26	1	10	2	1	10
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	20	10	20	20	10	20	20	20	20	20	20	20
Mvmt Flow	9	139	29	8	248	9	32	1	12	2	1	12

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	261	0	0	173	0	0	455	452	163	455	462	262
Stage 1	-	-	-	-	-	-	176	176	-	272	272	-
Stage 2	-	-	-	-	-	-	279	276	-	183	190	-
Critical Hdwy	4.3	-	-	4.3	-	-	7.3	6.7	6.4	7.3	6.7	6.4
Critical Hdwy Stg 1	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Follow-up Hdwy	2.38	-	-	2.38	-	-	3.68	4.18	3.48	3.68	4.18	3.48
Pot Cap-1 Maneuver	1206	-	-	1302	-	-	486	477	837	486	471	735
Stage 1	-	-	-	-	-	-	786	721	-	696	653	-
Stage 2	-	-	-	-	-	-	690	650	-	779	710	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1201	-	-	1296	-	-	467	466	830	468	460	729
Mov Cap-2 Maneuver	-	-	-	-	-	-	467	466	-	468	460	-
Stage 1	-	-	-	-	-	-	776	712	-	688	646	-
Stage 2	-	-	-	-	-	-	669	643	-	757	701	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.2	12.4	10.7
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	530	1201	-	-	1296	-	-	645
HCM Lane V/C Ratio	0.087	0.007	-	-	0.006	-	-	0.025
HCM Control Delay (s)	12.4	8	0	-	7.8	0	-	10.7
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	9	1	1	1	1	1	1	27	1	1	23	6
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	67	20	20	20	20	20	20	10	20	20	20	50
Mvmt Flow	11	1	1	1	1	1	1	34	1	1	29	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	83	83	43	83	86	44	41	0	0	40	0	0
Stage 1	40	40	-	42	42	-	-	-	-	-	-	-
Stage 2	43	43	-	41	44	-	-	-	-	-	-	-
Critical Hdwy	7.77	6.7	6.4	7.3	6.7	6.4	4.3	-	-	4.3	-	-
Critical Hdwy Stg 1	6.77	5.7	-	6.3	5.7	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.77	5.7	-	6.3	5.7	-	-	-	-	-	-	-
Follow-up Hdwy	4.103	4.18	3.48	3.68	4.18	3.48	2.38	-	-	2.38	-	-
Pot Cap-1 Maneuver	769	774	978	862	771	977	1460	-	-	1461	-	-
Stage 1	833	827	-	929	826	-	-	-	-	-	-	-
Stage 2	829	825	-	930	824	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	759	766	970	851	763	969	1454	-	-	1455	-	-
Mov Cap-2 Maneuver	759	766	-	851	763	-	-	-	-	-	-	-
Stage 1	829	823	-	924	822	-	-	-	-	-	-	-
Stage 2	822	821	-	923	820	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.7	9.2	0.3	0.2
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1454	-	-	775	853	1455	-	-
HCM Lane V/C Ratio	0.001	-	-	0.018	0.004	0.001	-	-
HCM Control Delay (s)	7.5	0	-	9.7	9.2	7.5	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	9	243	31	3	177	3	42	1	7	1	1	17
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	20	20	20	20	20	20	20	20	20	20	20	20
Mvmt Flow	11	304	39	4	221	4	52	1	9	1	1	21

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	230	0	0	348	0	0	598	589	333	592	606	233
Stage 1	-	-	-	-	-	-	351	351	-	236	236	-
Stage 2	-	-	-	-	-	-	247	238	-	356	370	-
Critical Hdwy	4.3	-	-	4.3	-	-	7.3	6.7	6.4	7.3	6.7	6.4
Critical Hdwy Stg 1	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Follow-up Hdwy	2.38	-	-	2.38	-	-	3.68	4.18	3.48	3.68	4.18	3.48
Pot Cap-1 Maneuver	1239	-	-	1117	-	-	389	397	669	393	388	764
Stage 1	-	-	-	-	-	-	630	602	-	728	678	-
Stage 2	-	-	-	-	-	-	718	676	-	626	590	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1234	-	-	1112	-	-	370	388	663	379	379	758
Mov Cap-2 Maneuver	-	-	-	-	-	-	370	388	-	379	379	-
Stage 1	-	-	-	-	-	-	620	593	-	717	672	-
Stage 2	-	-	-	-	-	-	691	670	-	607	581	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.1	15.8	10.4
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	395	1234	-	-	1112	-	-	686
HCM Lane V/C Ratio	0.158	0.009	-	-	0.003	-	-	0.035
HCM Control Delay (s)	15.8	7.9	0	-	8.2	0	-	10.4
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	19	1	1	1	1	11	1	19	1	1	27	7
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	67	20	20	20	20	20	20	10	20	20	20	50
Mvmt Flow	24	1	1	1	1	14	1	24	1	1	34	9

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	85	79	48	79	82	34	48	0	0	30	0	0
Stage 1	46	46	-	32	32	-	-	-	-	-	-	-
Stage 2	39	33	-	47	50	-	-	-	-	-	-	-
Critical Hdwy	7.77	6.7	6.4	7.3	6.7	6.4	4.3	-	-	4.3	-	-
Critical Hdwy Stg 1	6.77	5.7	-	6.3	5.7	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.77	5.7	-	6.3	5.7	-	-	-	-	-	-	-
Follow-up Hdwy	4.103	4.18	3.48	3.68	4.18	3.48	2.38	-	-	2.38	-	-
Pot Cap-1 Maneuver	766	778	972	868	775	990	1451	-	-	1474	-	-
Stage 1	826	822	-	940	834	-	-	-	-	-	-	-
Stage 2	834	833	-	923	819	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	747	770	964	857	767	982	1445	-	-	1468	-	-
Mov Cap-2 Maneuver	747	770	-	857	767	-	-	-	-	-	-	-
Stage 1	822	818	-	935	830	-	-	-	-	-	-	-
Stage 2	817	829	-	916	815	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.9	8.9	0.4	0.2
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1445	-	-	756	951	1468	-	-
HCM Lane V/C Ratio	0.001	-	-	0.035	0.017	0.001	-	-
HCM Control Delay (s)	7.5	0	-	9.9	8.9	7.5	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	8	122	25	7	218	8	29	1	11	2	1	11
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	20	10	20	20	10	20	20	20	20	20	20	20
Mvmt Flow	10	152	31	9	272	10	36	1	14	2	1	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	288	0	0	189	0	0	501	498	178	501	509	288
Stage 1	-	-	-	-	-	-	193	193	-	300	300	-
Stage 2	-	-	-	-	-	-	308	305	-	201	209	-
Critical Hdwy	4.3	-	-	4.3	-	-	7.3	6.7	6.4	7.3	6.7	6.4
Critical Hdwy Stg 1	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Follow-up Hdwy	2.38	-	-	2.38	-	-	3.68	4.18	3.48	3.68	4.18	3.48
Pot Cap-1 Maneuver	1178	-	-	1284	-	-	453	449	821	453	442	710
Stage 1	-	-	-	-	-	-	769	708	-	672	634	-
Stage 2	-	-	-	-	-	-	665	631	-	761	697	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1173	-	-	1279	-	-	433	437	814	435	430	704
Mov Cap-2 Maneuver	-	-	-	-	-	-	433	437	-	435	430	-
Stage 1	-	-	-	-	-	-	758	698	-	662	626	-
Stage 2	-	-	-	-	-	-	643	623	-	736	687	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.2	13.1	11
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	495	1173	-	-	1279	-	-	621
HCM Lane V/C Ratio	0.104	0.009	-	-	0.007	-	-	0.028
HCM Control Delay (s)	13.1	8.1	0	-	7.8	0	-	11
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	10	1	1	1	1	1	1	30	1	1	25	7
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	67	20	20	20	20	20	20	10	20	20	20	50
Mvmt Flow	12	1	1	1	1	1	1	38	1	1	31	9

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	90	89	46	90	94	48	45	0	0	44	0	0
Stage 1	43	43	-	46	46	-	-	-	-	-	-	-
Stage 2	47	46	-	44	48	-	-	-	-	-	-	-
Critical Hdwy	7.77	6.7	6.4	7.3	6.7	6.4	4.3	-	-	4.3	-	-
Critical Hdwy Stg 1	6.77	5.7	-	6.3	5.7	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.77	5.7	-	6.3	5.7	-	-	-	-	-	-	-
Follow-up Hdwy	4.103	4.18	3.48	3.68	4.18	3.48	2.38	-	-	2.38	-	-
Pot Cap-1 Maneuver	760	768	975	853	763	972	1455	-	-	1456	-	-
Stage 1	829	825	-	924	822	-	-	-	-	-	-	-
Stage 2	825	822	-	926	821	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	751	760	967	842	755	964	1449	-	-	1450	-	-
Mov Cap-2 Maneuver	751	760	-	842	755	-	-	-	-	-	-	-
Stage 1	825	821	-	919	818	-	-	-	-	-	-	-
Stage 2	818	818	-	919	817	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.8	9.3	0.2	0.2
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1449	-	-	766	845	1450	-	-
HCM Lane V/C Ratio	0.001	-	-	0.02	0.004	0.001	-	-
HCM Control Delay (s)	7.5	0	-	9.8	9.3	7.5	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	10	267	34	3	195	3	46	1	8	1	1	19
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	20	10	20	20	10	20	20	20	20	20	20	20
Mvmt Flow	12	334	42	4	244	4	58	1	10	1	1	24

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	253	0	0	381	0	0	656	645	365	649	664	256
Stage 1	-	-	-	-	-	-	385	385	-	258	258	-
Stage 2	-	-	-	-	-	-	271	260	-	391	406	-
Critical Hdwy	4.3	-	-	4.3	-	-	7.3	6.7	6.4	7.3	6.7	6.4
Critical Hdwy Stg 1	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Follow-up Hdwy	2.38	-	-	2.38	-	-	3.68	4.18	3.48	3.68	4.18	3.48
Pot Cap-1 Maneuver	1214	-	-	1086	-	-	355	368	642	359	359	741
Stage 1	-	-	-	-	-	-	603	581	-	709	662	-
Stage 2	-	-	-	-	-	-	697	661	-	599	568	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1209	-	-	1081	-	-	335	358	637	345	350	735
Mov Cap-2 Maneuver	-	-	-	-	-	-	335	358	-	345	350	-
Stage 1	-	-	-	-	-	-	592	570	-	696	657	-
Stage 2	-	-	-	-	-	-	668	656	-	578	558	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.1	17.3	10.6
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	360	1209	-	-	1081	-	-	664
HCM Lane V/C Ratio	0.191	0.01	-	-	0.003	-	-	0.04
HCM Control Delay (s)	17.3	8	0	-	8.3	0	-	10.6
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.7	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	21	1	1	1	1	12	1	21	1	1	30	8
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	67	20	20	20	20	20	20	10	20	20	20	50
Mvmt Flow	26	1	1	1	1	15	1	26	1	1	38	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	93	85	53	85	89	37	53	0	0	33	0	0
Stage 1	50	50	-	34	34	-	-	-	-	-	-	-
Stage 2	43	35	-	51	55	-	-	-	-	-	-	-
Critical Hdwy	7.77	6.7	6.4	7.3	6.7	6.4	4.3	-	-	4.3	-	-
Critical Hdwy Stg 1	6.77	5.7	-	6.3	5.7	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.77	5.7	-	6.3	5.7	-	-	-	-	-	-	-
Follow-up Hdwy	4.103	4.18	3.48	3.68	4.18	3.48	2.38	-	-	2.38	-	-
Pot Cap-1 Maneuver	757	772	966	860	768	986	1445	-	-	1470	-	-
Stage 1	822	819	-	938	832	-	-	-	-	-	-	-
Stage 2	829	831	-	918	815	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	737	764	958	849	760	978	1439	-	-	1464	-	-
Mov Cap-2 Maneuver	737	764	-	849	760	-	-	-	-	-	-	-
Stage 1	818	815	-	933	828	-	-	-	-	-	-	-
Stage 2	811	827	-	911	811	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10	8.9	0.3	0.2
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1439	-	-	746	948	1464	-	-
HCM Lane V/C Ratio	0.001	-	-	0.039	0.018	0.001	-	-
HCM Control Delay (s)	7.5	0	-	10	8.9	7.5	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	8	122	33	14	218	8	35	1	17	2	1	11
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	20	10	20	20	10	20	20	20	20	20	20	20
Mvmt Flow	10	152	41	18	272	10	44	1	21	2	1	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	288	0	0	199	0	0	523	521	183	527	537	288
Stage 1	-	-	-	-	-	-	198	198	-	318	318	-
Stage 2	-	-	-	-	-	-	325	323	-	209	219	-
Critical Hdwy	4.3	-	-	4.3	-	-	7.3	6.7	6.4	7.3	6.7	6.4
Critical Hdwy Stg 1	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Follow-up Hdwy	2.38	-	-	2.38	-	-	3.68	4.18	3.48	3.68	4.18	3.48
Pot Cap-1 Maneuver	1178	-	-	1273	-	-	437	435	815	435	426	710
Stage 1	-	-	-	-	-	-	764	705	-	657	623	-
Stage 2	-	-	-	-	-	-	651	619	-	754	690	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1173	-	-	1268	-	-	415	420	808	410	411	704
Mov Cap-2 Maneuver	-	-	-	-	-	-	415	420	-	410	411	-
Stage 1	-	-	-	-	-	-	753	695	-	648	610	-
Stage 2	-	-	-	-	-	-	623	606	-	722	680	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.5	13.5	11.1
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	492	1173	-	-	1268	-	-	610
HCM Lane V/C Ratio	0.135	0.009	-	-	0.014	-	-	0.029
HCM Control Delay (s)	13.5	8.1	0	-	7.9	0	-	11.1
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.5	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	22	1	1	1	1	1	1	30	1	1	25	22
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	67	20	20	20	20	20	20	10	20	20	20	50
Mvmt Flow	28	1	1	1	1	1	1	38	1	1	31	28

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	100	99	55	100	112	48	64	0	0	44	0	0
Stage 1	53	53	-	46	46	-	-	-	-	-	-	-
Stage 2	47	46	-	54	66	-	-	-	-	-	-	-
Critical Hdwy	7.77	6.7	6.4	7.3	6.7	6.4	4.3	-	-	4.3	-	-
Critical Hdwy Stg 1	6.77	5.7	-	6.3	5.7	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.77	5.7	-	6.3	5.7	-	-	-	-	-	-	-
Follow-up Hdwy	4.103	4.18	3.48	3.68	4.18	3.48	2.38	-	-	2.38	-	-
Pot Cap-1 Maneuver	748	758	963	840	746	972	1431	-	-	1456	-	-
Stage 1	818	817	-	924	822	-	-	-	-	-	-	-
Stage 2	825	822	-	915	806	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	739	750	955	829	738	964	1425	-	-	1450	-	-
Mov Cap-2 Maneuver	739	750	-	829	738	-	-	-	-	-	-	-
Stage 1	814	813	-	919	818	-	-	-	-	-	-	-
Stage 2	818	818	-	908	802	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10	9.3	0.2	0.2
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1425	-	-	746	834	1450	-	-
HCM Lane V/C Ratio	0.001	-	-	0.04	0.004	0.001	-	-
HCM Control Delay (s)	7.5	0	-	10	9.3	7.5	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	10	267	40	9	195	3	54	1	15	1	1	19
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	20	10	20	20	10	20	20	20	20	20	20	20
Mvmt Flow	12	334	50	11	244	4	68	1	19	1	1	24

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	253	0	0	389	0	0	675	664	369	672	687	256
Stage 1	-	-	-	-	-	-	389	389	-	273	273	-
Stage 2	-	-	-	-	-	-	286	275	-	399	414	-
Critical Hdwy	4.3	-	-	4.3	-	-	7.3	6.7	6.4	7.3	6.7	6.4
Critical Hdwy Stg 1	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Follow-up Hdwy	2.38	-	-	2.38	-	-	3.68	4.18	3.48	3.68	4.18	3.48
Pot Cap-1 Maneuver	1214	-	-	1078	-	-	345	359	638	346	348	741
Stage 1	-	-	-	-	-	-	600	578	-	695	652	-
Stage 2	-	-	-	-	-	-	684	651	-	593	563	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1209	-	-	1073	-	-	324	347	633	325	336	735
Mov Cap-2 Maneuver	-	-	-	-	-	-	324	347	-	325	336	-
Stage 1	-	-	-	-	-	-	589	567	-	682	641	-
Stage 2	-	-	-	-	-	-	650	640	-	564	553	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.4	18.1	10.7
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	362	1209	-	-	1073	-	-	658
HCM Lane V/C Ratio	0.242	0.01	-	-	0.01	-	-	0.04
HCM Control Delay (s)	18.1	8	0	-	8.4	0	-	10.7
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.9	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	36	1	1	1	1	12	1	21	1	1	30	20
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	67	20	20	20	20	20	20	10	20	20	20	50
Mvmt Flow	45	1	1	1	1	15	1	26	1	1	38	25

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	101	93	60	93	104	37	68	0	0	33	0	0
Stage 1	58	58	-	34	34	-	-	-	-	-	-	-
Stage 2	43	35	-	59	70	-	-	-	-	-	-	-
Critical Hdwy	7.77	6.7	6.4	7.3	6.7	6.4	4.3	-	-	4.3	-	-
Critical Hdwy Stg 1	6.77	5.7	-	6.3	5.7	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.77	5.7	-	6.3	5.7	-	-	-	-	-	-	-
Follow-up Hdwy	4.103	4.18	3.48	3.68	4.18	3.48	2.38	-	-	2.38	-	-
Pot Cap-1 Maneuver	747	764	957	849	753	986	1426	-	-	1470	-	-
Stage 1	813	812	-	938	832	-	-	-	-	-	-	-
Stage 2	829	831	-	909	803	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	727	756	949	838	745	978	1420	-	-	1464	-	-
Mov Cap-2 Maneuver	727	756	-	838	745	-	-	-	-	-	-	-
Stage 1	809	808	-	933	828	-	-	-	-	-	-	-
Stage 2	811	827	-	902	799	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.3	8.9	0.3	0.1
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1420	-	-	732	946	1464	-	-
HCM Lane V/C Ratio	0.001	-	-	0.065	0.018	0.001	-	-
HCM Control Delay (s)	7.5	0	-	10.3	8.9	7.5	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	-	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	9	135	28	7	242	9	32	1	12	2	1	12
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	20	10	20	20	10	20	20	20	20	20	20	20
Mvmt Flow	11	169	35	9	302	11	40	1	15	2	1	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	319	0	0	209	0	0	553	550	196	553	562	318
Stage 1	-	-	-	-	-	-	214	214	-	331	331	-
Stage 2	-	-	-	-	-	-	339	336	-	222	231	-
Critical Hdwy	4.3	-	-	4.3	-	-	7.3	6.7	6.4	7.3	6.7	6.4
Critical Hdwy Stg 1	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Follow-up Hdwy	2.38	-	-	2.38	-	-	3.68	4.18	3.48	3.68	4.18	3.48
Pot Cap-1 Maneuver	1146	-	-	1262	-	-	417	419	801	417	412	683
Stage 1	-	-	-	-	-	-	749	693	-	646	614	-
Stage 2	-	-	-	-	-	-	640	611	-	741	681	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1141	-	-	1257	-	-	397	407	794	399	400	677
Mov Cap-2 Maneuver	-	-	-	-	-	-	397	407	-	399	400	-
Stage 1	-	-	-	-	-	-	738	682	-	636	606	-
Stage 2	-	-	-	-	-	-	616	603	-	715	671	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.2	14	11.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	458	1141	-	-	1257	-	-	594
HCM Lane V/C Ratio	0.123	0.01	-	-	0.007	-	-	0.032
HCM Control Delay (s)	14	8.2	0	-	7.9	0	-	11.3
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	11	1	1	1	1	1	1	33	1	1	28	7
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	67	20	20	20	20	20	20	10	20	20	20	50
Mvmt Flow	14	1	1	1	1	1	1	41	1	1	35	9

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	98	97	49	97	100	52	49	0	0	48	0	0
Stage 1	47	47	-	49	49	-	-	-	-	-	-	-
Stage 2	51	50	-	48	51	-	-	-	-	-	-	-
Critical Hdwy	7.77	6.7	6.4	7.3	6.7	6.4	4.3	-	-	4.3	-	-
Critical Hdwy Stg 1	6.77	5.7	-	6.3	5.7	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.77	5.7	-	6.3	5.7	-	-	-	-	-	-	-
Follow-up Hdwy	4.103	4.18	3.48	3.68	4.18	3.48	2.38	-	-	2.38	-	-
Pot Cap-1 Maneuver	751	760	971	844	757	967	1450	-	-	1451	-	-
Stage 1	825	821	-	921	820	-	-	-	-	-	-	-
Stage 2	821	819	-	922	818	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	742	752	963	833	749	959	1444	-	-	1445	-	-
Mov Cap-2 Maneuver	742	752	-	833	749	-	-	-	-	-	-	-
Stage 1	821	817	-	916	816	-	-	-	-	-	-	-
Stage 2	814	815	-	915	814	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.9	9.3	0.2	0.2
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1444	-	-	756	838	1445	-	-
HCM Lane V/C Ratio	0.001	-	-	0.021	0.004	0.001	-	-
HCM Control Delay (s)	7.5	0	-	9.9	9.3	7.5	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	11	296	38	4	216	4	51	1	9	1	1	21
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	20	10	20	20	10	20	20	20	20	20	20	20
Mvmt Flow	14	370	48	5	270	5	64	1	11	1	1	26

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	280	0	0	423	0	0	727	716	404	721	738	283
Stage 1	-	-	-	-	-	-	426	426	-	288	288	-
Stage 2	-	-	-	-	-	-	301	290	-	433	450	-
Critical Hdwy	4.3	-	-	4.3	-	-	7.3	6.7	6.4	7.3	6.7	6.4
Critical Hdwy Stg 1	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Follow-up Hdwy	2.38	-	-	2.38	-	-	3.68	4.18	3.48	3.68	4.18	3.48
Pot Cap-1 Maneuver	1186	-	-	1046	-	-	317	335	609	320	325	715
Stage 1	-	-	-	-	-	-	573	556	-	682	642	-
Stage 2	-	-	-	-	-	-	671	641	-	567	542	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1181	-	-	1042	-	-	297	325	604	305	315	709
Mov Cap-2 Maneuver	-	-	-	-	-	-	297	325	-	305	315	-
Stage 1	-	-	-	-	-	-	561	545	-	668	635	-
Stage 2	-	-	-	-	-	-	638	634	-	544	531	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.2	19.6	10.9
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	322	1181	-	-	1042	-	-	638
HCM Lane V/C Ratio	0.237	0.012	-	-	0.005	-	-	0.045
HCM Control Delay (s)	19.6	8.1	0	-	8.5	0	-	10.9
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.9	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	23	1	1	1	1	13	1	23	1	1	33	9
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	67	20	20	20	20	20	20	10	20	20	20	50
Mvmt Flow	29	1	1	1	1	16	1	29	1	1	41	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	100	92	57	93	97	39	58	0	0	35	0	0
Stage 1	54	54	-	37	37	-	-	-	-	-	-	-
Stage 2	46	38	-	56	60	-	-	-	-	-	-	-
Critical Hdwy	7.77	6.7	6.4	7.3	6.7	6.4	4.3	-	-	4.3	-	-
Critical Hdwy Stg 1	6.77	5.7	-	6.3	5.7	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.77	5.7	-	6.3	5.7	-	-	-	-	-	-	-
Follow-up Hdwy	4.103	4.18	3.48	3.68	4.18	3.48	2.38	-	-	2.38	-	-
Pot Cap-1 Maneuver	748	765	961	849	760	983	1439	-	-	1468	-	-
Stage 1	817	816	-	934	830	-	-	-	-	-	-	-
Stage 2	826	829	-	913	811	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	727	757	953	838	752	975	1433	-	-	1462	-	-
Mov Cap-2 Maneuver	727	757	-	838	752	-	-	-	-	-	-	-
Stage 1	813	812	-	929	826	-	-	-	-	-	-	-
Stage 2	807	825	-	906	807	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.1	8.9	0.3	0.2
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1433	-	-	735	946	1462	-	-
HCM Lane V/C Ratio	0.001	-	-	0.043	0.02	0.001	-	-
HCM Control Delay (s)	7.5	0	-	10.1	8.9	7.5	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	9	135	36	14	242	9	38	1	18	2	1	12
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	20	10	20	20	10	20	20	20	20	20	20	20
Mvmt Flow	11	169	45	18	302	11	48	1	22	2	1	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	319	0	0	219	0	0	575	573	201	579	589	318
Stage 1	-	-	-	-	-	-	219	219	-	348	348	-
Stage 2	-	-	-	-	-	-	356	354	-	231	241	-
Critical Hdwy	4.3	-	-	4.3	-	-	7.3	6.7	6.4	7.3	6.7	6.4
Critical Hdwy Stg 1	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Follow-up Hdwy	2.38	-	-	2.38	-	-	3.68	4.18	3.48	3.68	4.18	3.48
Pot Cap-1 Maneuver	1146	-	-	1251	-	-	403	406	796	401	397	683
Stage 1	-	-	-	-	-	-	744	690	-	632	603	-
Stage 2	-	-	-	-	-	-	626	600	-	733	674	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1141	-	-	1246	-	-	381	391	789	377	382	677
Mov Cap-2 Maneuver	-	-	-	-	-	-	381	391	-	377	382	-
Stage 1	-	-	-	-	-	-	733	680	-	622	590	-
Stage 2	-	-	-	-	-	-	597	587	-	700	664	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.4	14.4	11.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	456	1141	-	-	1246	-	-	585
HCM Lane V/C Ratio	0.156	0.01	-	-	0.014	-	-	0.032
HCM Control Delay (s)	14.4	8.2	0	-	7.9	0	-	11.4
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.5	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	23	1	1	1	1	1	1	33	1	1	28	22
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	67	20	20	20	20	20	20	10	20	20	20	50
Mvmt Flow	29	1	1	1	1	1	1	41	1	1	35	28

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	107	106	59	107	119	52	68	0	0	48	0	0
Stage 1	56	56	-	49	49	-	-	-	-	-	-	-
Stage 2	51	50	-	58	70	-	-	-	-	-	-	-
Critical Hdwy	7.77	6.7	6.4	7.3	6.7	6.4	4.3	-	-	4.3	-	-
Critical Hdwy Stg 1	6.77	5.7	-	6.3	5.7	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.77	5.7	-	6.3	5.7	-	-	-	-	-	-	-
Follow-up Hdwy	4.103	4.18	3.48	3.68	4.18	3.48	2.38	-	-	2.38	-	-
Pot Cap-1 Maneuver	740	751	958	831	739	967	1426	-	-	1451	-	-
Stage 1	815	814	-	921	820	-	-	-	-	-	-	-
Stage 2	821	819	-	910	803	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	731	743	950	821	731	959	1420	-	-	1445	-	-
Mov Cap-2 Maneuver	731	743	-	821	731	-	-	-	-	-	-	-
Stage 1	811	810	-	916	816	-	-	-	-	-	-	-
Stage 2	814	815	-	903	799	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.1	9.4	0.2	0.1
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1420	-	-	738	827	1445	-	-
HCM Lane V/C Ratio	0.001	-	-	0.042	0.005	0.001	-	-
HCM Control Delay (s)	7.5	0	-	10.1	9.4	7.5	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	-	-

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	11	296	44	10	216	4	59	1	16	1	1	21
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	20	10	20	20	10	20	20	20	20	20	20	20
Mvmt Flow	14	370	55	12	270	5	74	1	20	1	1	26

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	280	0	0	430	0	0	746	735	408	744	761	283
Stage 1	-	-	-	-	-	-	430	430	-	303	303	-
Stage 2	-	-	-	-	-	-	316	305	-	441	458	-
Critical Hdwy	4.3	-	-	4.3	-	-	7.3	6.7	6.4	7.3	6.7	6.4
Critical Hdwy Stg 1	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Follow-up Hdwy	2.38	-	-	2.38	-	-	3.68	4.18	3.48	3.68	4.18	3.48
Pot Cap-1 Maneuver	1186	-	-	1040	-	-	308	326	606	309	315	715
Stage 1	-	-	-	-	-	-	570	554	-	669	632	-
Stage 2	-	-	-	-	-	-	658	631	-	562	538	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1181	-	-	1036	-	-	286	313	601	288	303	709
Mov Cap-2 Maneuver	-	-	-	-	-	-	286	313	-	288	303	-
Stage 1	-	-	-	-	-	-	559	543	-	656	620	-
Stage 2	-	-	-	-	-	-	620	619	-	531	527	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.4	20.8	11
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	322	1181	-	-	1036	-	-	632
HCM Lane V/C Ratio	0.295	0.012	-	-	0.012	-	-	0.045
HCM Control Delay (s)	20.8	8.1	0	-	8.5	0	-	11
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1.2	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	38	1	1	1	1	13	1	23	1	1	33	21
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	67	20	20	20	20	20	20	10	20	20	20	50
Mvmt Flow	48	1	1	1	1	16	1	29	1	1	41	26

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	108	100	64	100	112	39	73	0	0	35	0	0
Stage 1	62	62	-	37	37	-	-	-	-	-	-	-
Stage 2	46	38	-	63	75	-	-	-	-	-	-	-
Critical Hdwy	7.77	6.7	6.4	7.3	6.7	6.4	4.3	-	-	4.3	-	-
Critical Hdwy Stg 1	6.77	5.7	-	6.3	5.7	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.77	5.7	-	6.3	5.7	-	-	-	-	-	-	-
Follow-up Hdwy	4.103	4.18	3.48	3.68	4.18	3.48	2.38	-	-	2.38	-	-
Pot Cap-1 Maneuver	739	757	952	840	746	983	1420	-	-	1468	-	-
Stage 1	809	809	-	934	830	-	-	-	-	-	-	-
Stage 2	826	829	-	905	799	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	719	749	944	829	738	975	1414	-	-	1462	-	-
Mov Cap-2 Maneuver	719	749	-	829	738	-	-	-	-	-	-	-
Stage 1	805	805	-	929	826	-	-	-	-	-	-	-
Stage 2	807	825	-	898	795	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.3	8.9	0.3	0.1
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1414	-	-	724	944	1462	-	-
HCM Lane V/C Ratio	0.001	-	-	0.069	0.02	0.001	-	-
HCM Control Delay (s)	7.5	0	-	10.3	8.9	7.5	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	-	-

Traffic Data

Road Appraisal Sheet

Section No	1210	*Length*	3.4	*Old Sect No*	121

Road Name	Bay Lake Road A				
From	Hwy 62	*Km*	0.5	*Direction*	S
To	Barton Lane	*Km*	0	*Direction*	

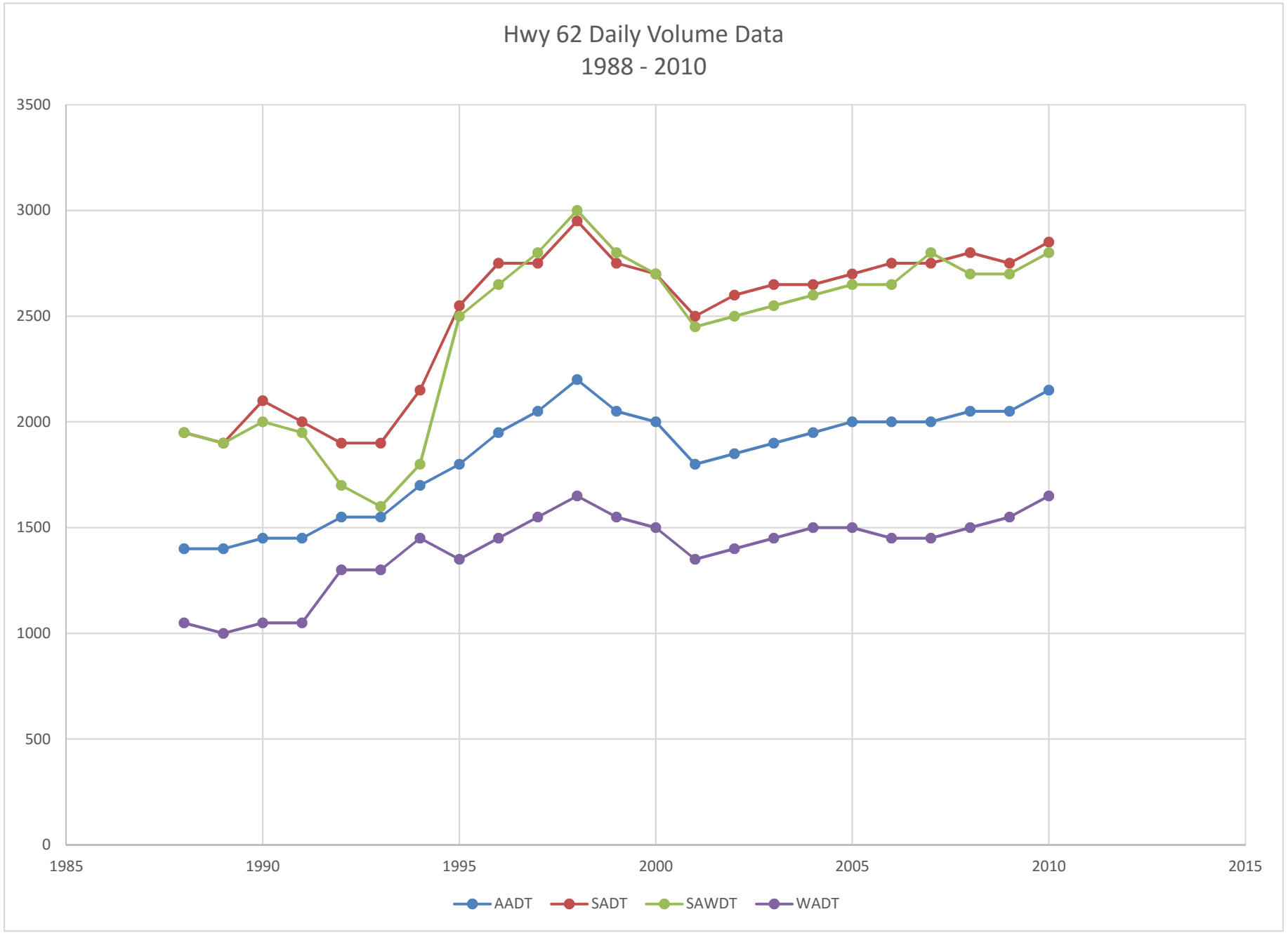
Surf Type	LCB	*Platform Width*	7	*Surface Width*	6
		Road Allowance:	Forced Road		
Road Environ	R	*Drainage*	ND	*Speed*	60
Boundary Road	N	*Classification*	5	*Old Class*	M5

Road Condition 6

Construction: $650,063

Ditching: $0

Remarks


Hwy 62 Daily Volume Data
1988 - 2010
3500
3000
2500
2000
1500
1000
500
0
1985
1990
1995
2000
2005
2010
2015
AADT
SADT
SAWDT
WADT

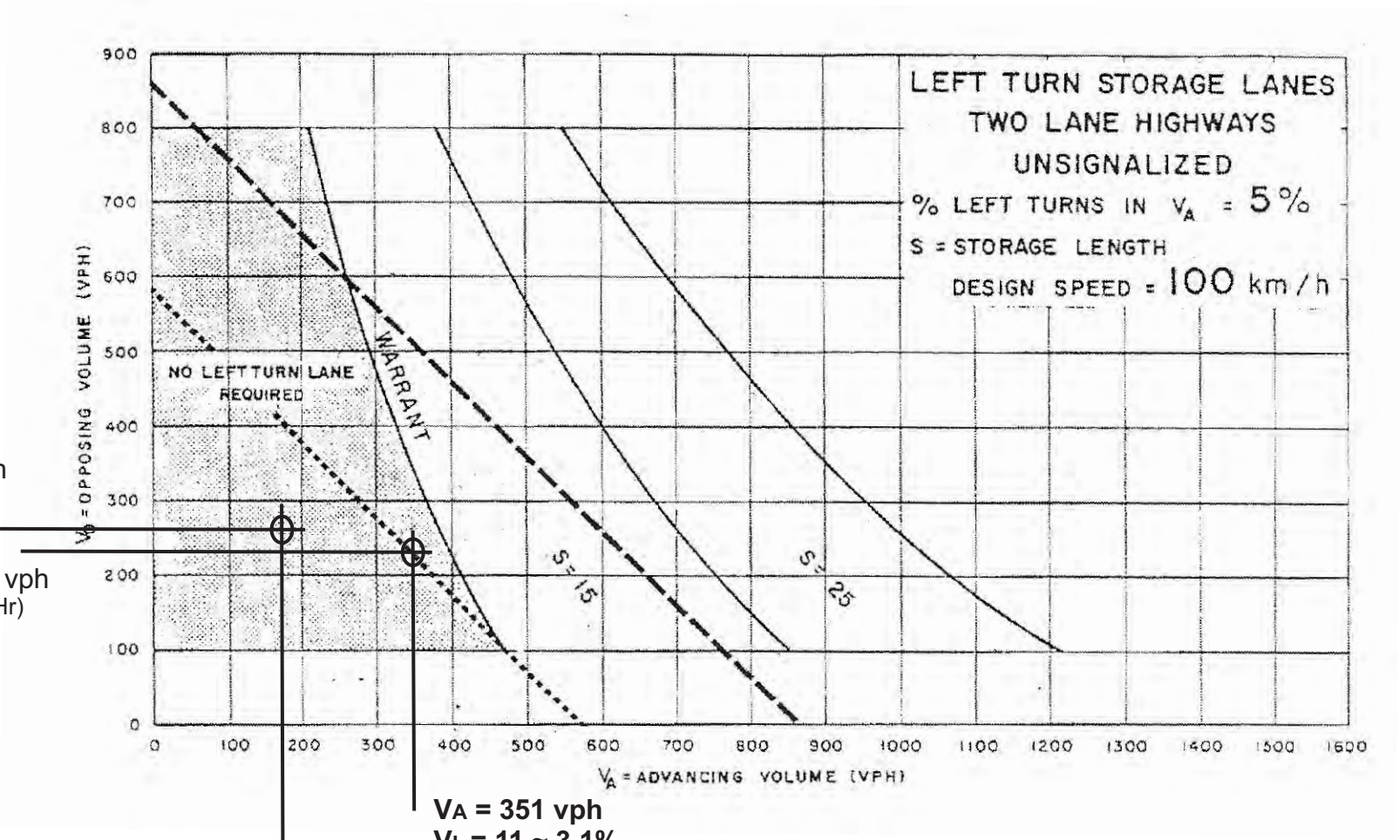
Highway 62 Daily Traffic Vols 1988 - 2010

Section Green's Corners to Sth Lmts Bancroft

Year	AADT	SADT	SAWDT	WADT	AR
1988	1400	1950	1950	1050	3.9
1989	1400	1900	1900	1000	2.5
1990	1450	2100	2000	1050	0.3
1991	1450	2000	1950	1050	3.4
1992	1550	1900	1700	1300	1.9
1993	1550	1900	1600	1300	2.2
1994	1700	2150	1800	1450	1.5
1995	1800	2550	2500	1350	3.0
1996	1950	2750	2650	1450	3.3
1997	2050	2750	2800	1550	1.2
1998	2200	2950	3000	1650	2.9
1999	2050	2750	2800	1550	2.7
2000	2000	2700	2700	1500	1.2
2001	1800	2500	2450	1350	0.6
2002	1850	2600	2500	1400	3.0
2003	1900	2650	2550	1450	3.1
2004	1950	2650	2600	1500	2.3
2005	2000	2700	2650	1500	3.5
2006	2000	2750	2650	1450	3.0
2007	2000	2750	2800	1450	1.2
2008	2050	2800	2700	1500	2.7
2009	2050	2750	2700	1550	3.4
2010	2150	2850	2800	1650	2.3

Auxiliary Lane Warrant Analyses

Left Turn Lane Warrant Analyses
Southbound Hwy 62 at Bay Lake Road
(2025 Total Traffic Conditions)



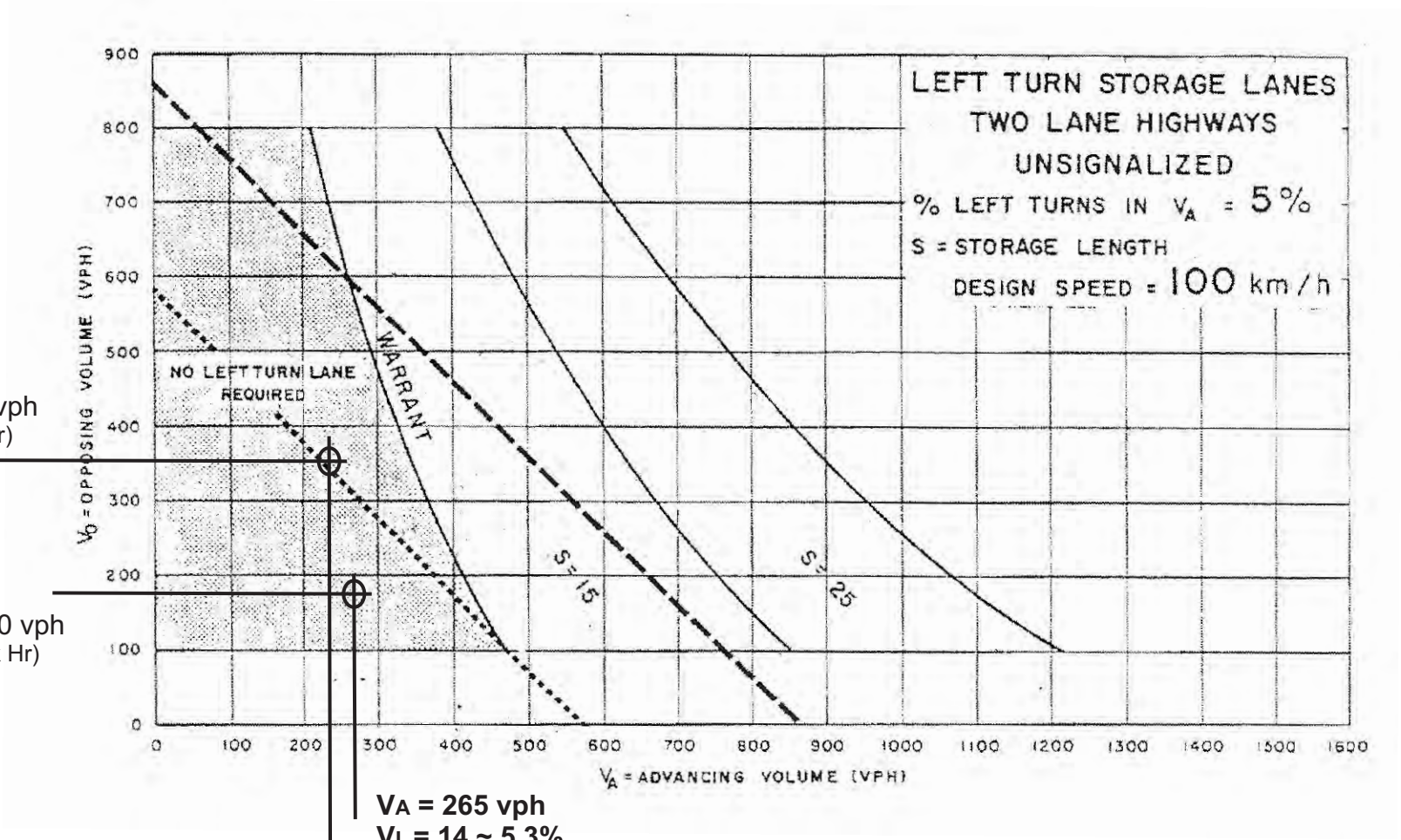
Vo = 265 vph
(AM Pk Hr)

Vo = 230 vph
(PM Pk Hr)

V_A = 351 vph
V_L = 11 ~ 3.1%

V_A = 180 vph
V_L = 9 ~ 5%

Left Turn Lane Warrant Analyses
Northbound Hwy 62 at Bay Lake Road
(2025 Total Traffic Conditions)



V_O = 351 vph
(PM Pk Hr)

V_O = 180 vph
(AM Pk Hr)

V_A = 265 vph
V_L = 14 ~ 5.3%

V_A = 230 vph
V_L = 10 ~ 4.3%