

633 Coronation Drive

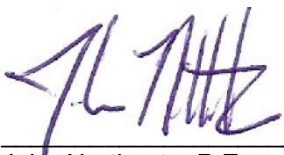
City of Toronto

Traffic Impact Study for Coronation Organics Processing Inc.

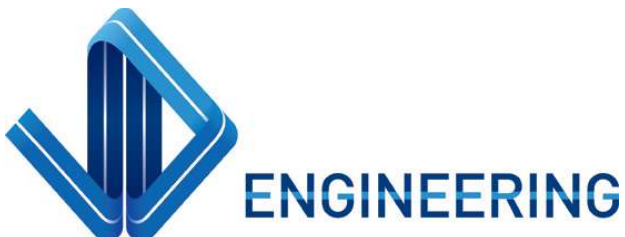
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Executive Summary

This report summarizes the traffic impact study prepared for the proposed industrial development on a site municipally known as 633 Coronation Drive, located on the south side of Coronation Drive, between Chemical Court and Beechgrove Drive in the Borough of Scarborough, City of Toronto [City].

The report assesses the impact of traffic related to the development on the adjacent roadway and provides recommendations to accommodate this traffic in a safe and efficient manner.

The proposed development includes the construction an Organic Processing Centre and ancillary buildings. Access to the development will be provided via existing driveway connections onto Coronation Drive.

The scope of this analysis includes a review of the following intersections:

- Coronation Drive / Beechgrove Drive;
- Coronation Drive / Manse Road;
- Beechgrove Drive / Lawrence Avenue East; and
- Manse Road / Lawrence Avenue East.

Conclusions

1. The proposed development is expected to generate a total of 39 AM peak hour trips, 39 PM peak hour trips and 34 evening peak hour trips.
2. With timing of the study coinciding with the COVID-19 pandemic, detailed turning movements counts were not commissioned at the study area intersections recognizing that any retrieved data would not reflect typical roadway operations. Rather, historic turning movement counts were obtained from the City and modified appropriately to reflect existing (2020) conditions (detailed in Section 2.3 of this report).
3. An intersection operation analysis was completed at the study area intersections, using the existing (2020) traffic volumes without the proposed development traffic. This enabled a review of existing traffic deficiencies that would be present without the influence of the proposed development. After review, it was determined that the study area intersections are providing satisfactory conditions with available capacity to facilitate additional growth.
4. An estimate of the amount of traffic that would be generated by the Subject Site, operating at a 24 hours / 5 day work week, at a peak capacity of 1240 tonnes/day was prepared and assigned to the study area streets and intersections. The 24/5 operating scenario considered by the developer reflects an approximate processing reduction of 29% in comparison to a 24 hour / 7 day a week.
5. An intersection operation analysis was completed under total (2020) traffic volumes with the proposed development operational at the study area intersections. The analyses indicate that the study area intersections will operate at near identical levels to those experienced under the existing (2020) conditions, indicating that the proposed development will have minimal impact from an operational standpoint.
6. A 24 hour / 7 day work week was reviewed, noting that an increase in daily tuck traffic is not expected given the daily capacity restraint. Traffic operations on the weekend is expected to be less critical than the weekday commuter periods analyzed. No operational issues are anticipated as a result of the 24 hour / 7 day week.
7. In summary, the proposed development will not cause any operational issues and will not add significant delay or congestion to the local roadway network.

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1 Introduction

1.1 Background

Coronation Organics Processing Inc. [The Developer] is proposing an industrial development on a site municipally known as 633 Coronation Drive, located on the south side of Coronation Drive between Chemical Court and Beechgrove Drive in the Borough of Scarborough, City of Toronto [City]. The proposed industrial development includes an Organic Processing Centre.

Access to the development will be provided via existing full-movement driveway connections onto Coronation Drive.

The Developer has retained **JD Northcote Engineering Inc.** [JD Engineering] to prepare this traffic impact study in support of the proposed development.

Existing (2020) traffic volumes at the study area intersections were developed based on historical counts obtained from the City, modified appropriately to reflect existing (2020) conditions (detailed in Section 2.3).

1.2 Study Area

Figure 1 shows the location of the subject site and study area intersections in relation to the surrounding area. The Site Plan with illustrated truck traffic routes through the site is provided in **Appendix A**.

The subject site is bound by existing industrial lands to the west and east, Coronation Drive to the north and the Lakeshore East Go Train Line to the south.

The following intersections are included in the traffic impact study:

- Coronation Drive / Beechgrove Drive;
- Coronation Drive / Manse Road;
- Beechgrove Drive / Lawrence Avenue East; and
- Manse Road / Lawrence Avenue East.

Figure 1 – Proposed Site Location and Study Area



1.3 Study Scope and Objectives

The purpose of this study is to support the public outreach and neighbour consultation process in addressing any local concern related to increased truck traffic. The study analysis includes the following tasks:

- Determine existing traffic volumes and circulation patterns (detailed in Section 2.3);
- Estimate future traffic volumes if the proposed development was not constructed, including the impact of additional proposed developments in the area;
- Complete level-of-service [LOS] analysis of horizon year (without the proposed development) traffic conditions and identify operational deficiencies;
- Estimate the amount of traffic that would be generated by the proposed development and assign to the roadway network;
- Complete LOS analysis of horizon year (with the proposed development) traffic conditions and identify additional operational deficiencies;
- Identify improvement options to address operational deficiencies;

- Comment on the suitability of the roadways to accommodate the additional traffic from the proposed development;
- Assess the impact of a 24/7 operation versus a 24/5 operation; and
- Document findings and recommendations in a final report.

1.4 Horizon Year and Analysis Periods

Traffic scenarios for the existing year (2020) and existing year (2020) with proposed development scenarios were selected for analysis of traffic operations in the study area. The weekday morning [AM], weekday afternoon [PM] and weekday evening [EVE] (10pm) peak hours have been selected as the analysis periods for this study.

2 Information Gathering

2.1 Street and Intersection Characteristics

Lawrence Avenue East is a four-lane minor arterial road with an urban cross-section and sidewalks on both sides of the road within the study area. The posted speed limit on Lawrence Avenue East is 60km/h. Lawrence Avenue East is under the jurisdiction of the City.

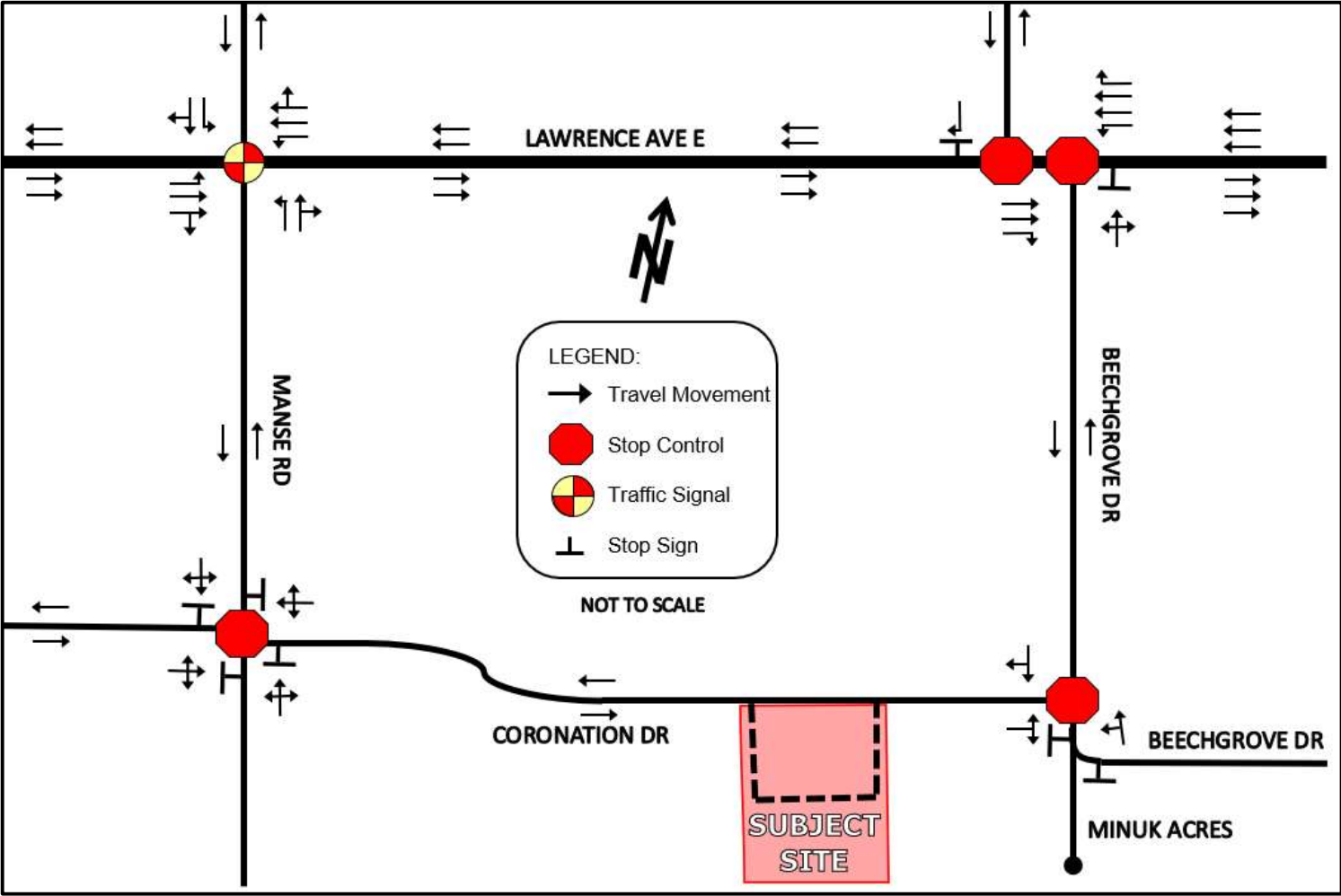
Manse Road is a two-lane collector road with an urban cross-section and sidewalks on both sides of the road within the study area. Between Lawrence Avenue East and Coronation Drive, Manse Road has a “community safety zone” with posted speed limit of 40km/h. The asphalt platform on Manse Road is relatively consistent through the study area (approximately 9.0 metres), providing 4.5 metres travel lanes. Parking is prohibited on both sides of the road. Manse Road is under the jurisdiction of the City.

Beechgrove Drive is a two-lane collector road with an urban cross-section and sidewalk on the east side of the road within the study area. The asphalt platform on Beechgrove Drive is relatively consistent through the study area (approximately 12.0 metres), providing 6.0 metre travel lanes. Parking is restricted on both sides of the road between the hours of 07:00 – 18:00. Beechgrove Drive has a posted speed limit of 40km/h and is under the jurisdiction of the City.

Coronation Drive is a two-lane collector road with an urban cross-section and sidewalk on the north side of the road within the study area. The road provides a 12.0 metre asphalt platform with 6.0 metre travel lanes. Coronation Drive has a posted speed limit of 50km/h and is under the jurisdiction of the City.

The existing intersection spacing and lane configuration within the study area is illustrated in **Figure 2**.

Figure 2 – Existing (2020) Intersection Spacing and Lane Configuration with in Study Area



2.2 Traffic Counts

Detailed turning movement traffic and pedestrian counts were obtained from the City for all existing study area intersections.

Table 1 summarizes the traffic count data collection information.

Table 1 – Traffic Count Data

Intersection (E-W Street / N-S Street)	Count Date	AM Peak Hour	PM Peak Hour	Source
Lawrence Avenue / Manse Road	Wednesday, October 22, 2014	08:30 – 09:30	16:00 – 17:00	City
Lawrence Avenue / Beechgrove Drive	Wednesday, February 8, 2017	08:00 – 09:00	16:30 – 17:30	City
Coronation Drive / Manse Road	Wednesday, October 22, 2014	08:30 – 09:30	16:00 – 17:00	City
Coronation Drive / Beechgrove Drive	Wednesday, October 22, 2014	08:30 – 09:30	16:00 – 17:00	City

Detailed traffic count data can be found in **Appendix B**. Heavy vehicle percentages from the traffic count data have also been included in the Synchro analysis.

Typically, with above traffic counts being somewhat dated, new counts would be commissioned at these intersections to reflect existing traffic conditions. However, with the timing of the study coinciding with the COVID-19 pandemic, any retrieved data would not reflect typical roadway operations. As such, alternative measures were taken to update the noted counts to reflect 2020 conditions.

In order to estimate the evening peak hour traffic volumes, 24-hour directional counts were obtained for the segment of Lawrence Avenue, east and west of Bennet Road. Over the course of a typical Wednesday and Thursday, the 24-hour data indicates that the evening peak hour (10pm) reflects approximately 30% of the PM peak hour volumes. For the purpose of this study and in order to remain conservative, the evening peak hour has been established using 40% of the PM peak hour volumes.

2.3 Background Traffic Growth

2.3.1 Population Growth

The *City of Toronto Ward Profile 25 – Scarborough-Rouge Park* indicates a population increase of 1.7% in the local area between 2006 to 2016, translating to an average annual growth rate of 0.34%. It is noted that a population decrease of 0.4% occurred over the most recent 5-year period (2011 to 2016).

2.3.2 Historic Traffic Growth

Through correspondence with City Staff and in review of the City's Open Data Catalogue it is realized that no recent traffic data is available on the study area road network that would allow for historic growth comparisons. As such, the comparison has been expanded outside of the local area to include the nearest sections of Highway 2 (Kingston Road) and Highway 401, as published by the Ministry of Transportation Ontario [MTO].

The Annual Average Daily Traffic (AADT) volumes on Highway 2 and Highway 401 for the period of 2010 to 2016 shows an average annual increase of 1.0% and 0.8%, respectively.

2.3.3 Overall Background Growth Rate

In consideration of the historic population growth and future growth projections for area, a conservative background growth rate of 1.5% per annum has been applied to the study area roadways.

2.4 Development Growth

In review of the available aerial imagery, it is evident that recent development has occurred in the local area. In order to account for the development traffic that would not otherwise be captured in the 2014 and 2017 traffic counts, the following developments have been explicitly considered in the establishment of the existing year (2020) traffic volumes:

- 280 Manse Road (Heron Park) - 122 townhouse units;
- Highland Creek Phase 2 (Asterfield Drive) – 23 single detached units;
- Woodgrove Drive – 19 single detached units; and
- Highland Creek Treatment Plant – 20,000 ft² (1,858 m² Administration / Process Control building expansion)

Figure 3 shows the location of the above noted adjacent areas and developments in relation to the subject site.

Figure 3 – Development Location within Study Area



2.4.1 Development Growth Traffic Generation

Traffic generation for the recent developments have been calculated based on the data provided in the Institute of Transportation Engineers [ITE] Trip Generation Manual (10th Edition) [ITE Trip Generation Manual]. The following ITE land uses have been applied to estimate the traffic from the recent developments:

- ITE land use 110 (General Light Industrial)
 - General Urban / Suburban Setting;
- ITE land use 210 (Single-Family Detached Housing)
 - General Urban / Suburban Setting; and
- ITE land use 220 (Multifamily Housing (Low-Rise))
 - General Urban / Suburban Setting.

The AM and PM peak hour traffic generation for the adjacent developments do not exactly align with the AM and PM peak hour in the traffic counts; consequently, we have applied the peak hour of adjacent street traffic values provided in the ITE Trip Generation Manual. For the purpose of this study, trip generation rates for the PM peak hour have been utilized to estimate the EVE peak hour trips. While its recognized that the evening trips are expected to be lower, this assumption provides a conservative estimate.

For trip rates showing a strong statistical relationship, fitted curve equations have been utilized. **Table 2** summarizes the utilized trips generation rates and equations.

Table 2 – ITE Traffic Generation Rates & Equations

Land Use	Trip Basis	AM Peak Hour			PM/EVE Peak Hour		
		IN	OUT	TOTAL	IN	OUT	TOTAL
General Light Industrial ITE Land Use: 110	rate (1000 ft ²)	0.62	0.08	0.7	0.08	0.55	0.63
Single-Family Detached ITE Land Use: 210	equation (units)	T = 0.71 X + 4.80			Ln(T) = 0.96 Ln(X) + 0.2		
	distribution	25%	75%	100%	63%	37%	100%
Multifamily Housing (Low-Rise) ITE Land Use: 220	equation (units)	Ln(T) = 0.95 Ln(X) - 0.51			Ln(T) = 0.89 Ln(X) - 0.02		
	distribution	23%	77%	100%	63%	37%	100%

The estimated trip generation of the proposed development is illustrated below in **Table 3**.

Table 3 – Estimated Traffic Generation of Proposed Development

Development	Size	AM Peak Hour			PM/EVE Peak Hour		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Highland Creek Treatment Plant	20,000 ft ²	12	2	14	2	11	13
280 Manse Road	122 units	13	45	58	44	27	71
Asterfield Drive	23 units	5	16	21	16	9	25
Woodgrove Drive	19 units	5	14	19	13	8	21
Total		35	77	112	75	55	130

2.4.2 Development Growth Traffic Generation

The distribution of generated traffic has been calculated based on the 2016 Transportation Tomorrow Survey [TTS] data for traffic zone 570 retrieved using the TTS Internet Data Retrieval System [IDRS] (output attached as **Appendix C**). TTS data provides historical origin and destination trip percentages for specific areas within the Greater Toronto and Hamilton Area [GTHA].

Traffic distribution for the trips generated by all the developments are expected to generally follow commuter travel patterns. Our analysis is based on egress traffic during the AM peak hour. Logically, the distribution of ingress traffic will follow the inverse of the exiting traffic distribution. For each of the individual areas identified in the TTS data, we have selected the probable route of travel, assuming that people will select their route primarily based on travel time.

The distribution of trips is illustrated in **Table 4** using the methodology outlined above.

Table 4 – Development Growth Traffic Distribution

Travel Direction (to / from)	Percent of Total Traffic Generation
North	25%
East	15%
West	60%
TOTAL	100%

The distribution of traffic entering/exiting each development is based on the development's location within the study area and proximity to available major transportation routes (i.e. Highway 40, Kingston Road etc.).

The traffic assignment for recent developments for the AM, PM and evening peak hours is illustrated in **Figure 4** through **Figure 7**.

2.5 Existing Year Traffic Volumes

The 2020 existing AM and PM peak hour traffic volumes through the study area have been established based on the obtained traffic counts, adjusted to reflect the annual background growth

rate noted in Section 2.3 in addition to the recent developments in the study area. As previously mentioned, the evening peak hour traffic volumes have been established using 40% of the PM peak hour volumes.

The existing (2020) AM, PM and evening peak hour traffic volumes are illustrated in **Figure 8**.

3 Existing Operations

3.1 Introduction

Existing year operational conditions were established to determine how the street network within the study area is currently functioning without the proposed development. This provides a base case scenario to compare with future development scenarios. Traffic operations within the study area were evaluated using the 2020 traffic volumes with the existing road configuration and traffic control. The intersection performance was measured using the traffic analysis software, Synchro 10, a deterministic model that employs Highway Capacity Manual and Intersection Capacity Utilization methodologies for analyzing intersection operations. These procedures are accepted by provincial and municipal agencies throughout North America.

Synchro 10 enables the study area to be graphically defined in terms of streets and intersections, along with their geometric and traffic control characteristics. The user is able to evaluate both signalized and unsignalized intersections in relation to each other, thus not only providing level of service for the individual intersections, but also enabling an assessment of the impact the various intersections in a network have on each other in terms of spacing, traffic congestion, delay, and queuing.

Individual turning movements with a volume-to-capacity [V/C] ratio of 0.85 or greater are considered to be critical movements and have been highlighted in the LOS tables.

The intersection operations were also evaluated in terms of the LOS. LOS is a common measure of the quality of performance at an intersection and is defined in terms of vehicular delay. This delay includes deceleration delay, queue move-up time, stopped delay, and acceleration delay. LOS is expressed on a scale of A through F, where LOS A represents very little delay (i.e. less than 10 seconds per vehicle) and LOS F represents very high delay (i.e. greater than 50 seconds per vehicle for a stop sign controlled intersection and greater than 80 seconds per vehicle for a signalized intersection).

The LOS criteria for signalized and stop sign controlled intersections are shown in **Table 5**. A description of traffic performance characteristics is included for each LOS.

Table 5 – Level of Service Criteria for Intersections

LOS	LOS Description	Control Delay (seconds per vehicle)	
		Signalized Intersections	Stop Controlled Intersections
A	Very low delay; most vehicles do not stop (Excellent)	less than 10.0	less than 10.0
B	Higher delay; more vehicles stop (Very Good)	between 10.0 and 20.0	between 10.0 and 15.0
C	Higher level of congestion; number of vehicles stopping is significant, although many still pass through intersection without stopping (Good)	between 20.0 and 35.0	between 15.0 and 25.0
D	Congestion becomes noticeable; vehicles must sometimes wait through more than one red light; many vehicles stop (Satisfactory)	between 35.0 and 55.0	between 25.0 and 35.0
E	Vehicles must often wait through more than one red light; considered by many agencies to be the limit of acceptable delay	between 55.0 and 80.0	between 35.0 and 50.0
F	This level is considered to be unacceptable to most drivers; occurs when arrival flow rates exceed the capacity of the intersection (Unacceptable)	greater than 80.0	greater than 50.0

3.2 Existing (2020) Intersection Operation

The results of the LOS analysis under existing (2020) traffic volumes during the AM, PM and evening peak hours can be found below in **Table 6**. Existing intersection geometry and traffic control have been utilized for this scenario. Detailed output of the Synchro analysis can be found in **Appendix D**.

The results of the LOS analysis indicate that all the intersections in the study area are operating at a satisfactory LOS or better for all turning movements.

No improvements are necessary to accommodate the existing traffic volume.

Table 6 – Existing (2020) LOS

Location (E-W Street / N-S Street)	Weekday AM Peak Hour			Weekday PM Peak Hour			Weekday EVE Peak Hour		
	V/C	Delay (s)	LOS	V/C	Delay (s)	LOS	V/C	Delay (s)	LOS
Lawrence Avenue E / Manse Road (signalized)	0.60	14.5	B	0.47	12.1	B	0.19	9.6	A
EBL	0.05	6.9	A	0.14	6.2	A	0.04	3.3	A
EBTR	0.16	7.1	A	0.42	7.5	A	0.15	3.6	A
WBL	0.13	7.7	A	0.37	10.2	B	0.11	4.0	A
WBTR	0.53	10.5	B	0.25	6.7	A	0.09	3.7	A
NBL	0.65	31.6	C	0.60	25.8	C	0.39	25.2	C
NBTR	0.18	19.3	B	0.61	24.9	C	0.33	24.4	C
SBL	0.03	17.8	B	0.11	19.4	B	0.06	22.1	C
SBTR	0.72	27.1	C	0.38	21.0	C	0.23	23.0	C
Lawrence Avenue E / Beechwood Drive (unsignalized)	-	3.5	A	-	4.3	A	-	1.9	A
EBTR	0.08	0.0	-	0.15	0.0	-	0.07	0.0	-
WBL	0.13	8.8	A	0.08	9.5	A	0.02	8.0	A
WBTR	0.20	0.0	-	0.10	0.0	-	0.05	0.0	-
NB	0.51	32.5	D	0.56	26.5	D	0.13	10.9	B
SB	0.01	10.8	B	0.01	9.3	A	0.00	8.8	A
Coronation Drive / Manse Road (unsignalized)	-	10.2	B	-	10.3	B	-	7.7	A
EB	0.24	9.8	A	0.46	11.7	B	0.16	8.1	A
WB	0.21	9.4	A	0.18	8.7	A	0.06	7.3	A
NB	0.06	9.1	A	0.08	9.2	A	0.03	7.9	A
SB	0.44	10.8	B	0.21	9.1	A	0.07	7.3	A
Coronation Drive / Beechwood Drive (unsignalized)	-	2.1	A	-	5.9	A	-	5.3	A
EB	0.06	9.8	A	0.18	9.9	A	0.07	9.0	A
NB	0.01	3.8	A	0.00	0.7	A	0.00	1.5	A
SB	0.12	0.0	-	0.04	0.0	-	0.02	0.0	-

4 Proposed Development

4.1 Traffic Generation

The traffic generation for proposed development has been estimated based operational details provided by the Developer. The Developer has indicated that an application has been made to receive and process up to 1240 tonnes of material per day from the Province of Ontario, with expectation that approximately 90% of the material will come from the Greater Toronto Area (GTA). The application includes the ability to run the organics facility 24 hours a day, 7 days a week; however, the Developer has indicated that they are also considering a 5-day work week (Monday through Friday). Recognizing the application is based on a daily processing limit, the 24 hour / 5 days a week operating schedule would result in an approximate overall operational reduction of 29% in comparison to a 24 hour / 7 day a week. No additional daily operations are being sought after as result of the reduced work week.

While the operating days have yet to be confirmed, the 24 hour / 5 days a week operating schedule has been utilized for analyze in this report. Furthermore, to ensure a conservative approach, the site has been assumed to be operating at the full daily capacity of 1240 tonnes per day.

In terms of daily operations, the development traffic is expected to be made up of incoming substrate, outgoing digestate, outgoing clean organics and outgoing inorganics delivers, in addition to employee traffic.

The Developer has indicated that the majority of substrate deliveries will occur overnight between 18:00 and 06:00, utilizing 34 tonne trucks with an average tonnage of 27 tonnes/trucks. From 06:00 to 18:00 substrate delivers will utilize smaller carrier vans and trucks with an average of 5 tonnes/vehicle. Outgoing digestate and clean organics deliveries are estimated to see 540 tonnes and 525 tonnes respectively, with an average truck load of 40 tonnes/truck. Outgoing inorganics delivers are estimated at 3 trucks per day at an average of 25 tonnes/truck.

For illustrative purposes, the developer has provided photographs of the heavy truck types (available in **Appendix F**).

Three employee shifts are anticipated, with 20 employees expected for the typical 07:00 – 16:00 shift and a reduced staffing of 5 employees for the evening and overnight shifts.

The future operating conditions are summarized below:

- Hours of operations: 24 hours a day, Monday – Friday;
- 1240 tonnes of inbound substrate per day;
- Typical 18:00 – 06:00 incoming substrate: 41 trucks x 27 tonnes per truck;
- Typical 06:00 – 18:00 incoming substrate: 24 trucks x 5 tonnes per truck;
- Daily outgoing digestate: 14 trucks x 40 tonnes per truck;
- Daily outgoing clean organics: 13 trucks x 40 tonnes per truck;
- Daily outgoing inorganics: 3 trucks x 25 tonnes per truck; and
- 20 employees 07:00 – 16:00, 5 employees during evening & overnight shifts.

With respect to traffic generation, it has been assumed that all staff will arrive and depart to/from the subject site in separate, private vehicles. It is assumed that a total of 20% of daily deliveries will occur during the peak hours - with 5% occurring during both the AM and PM peak hours, and 10% during the evening peak hour, recognizing that a higher proportion of incoming substrate delivers will occur between 18:00 and 06:00. The remaining 80% of deliveries will occur through the remaining 21 hours of the 24 hour operating day (considered a conservative estimate recognizing that 21 hours makes up 88% of the operating day). With respect to the outgoing inorganics deliveries, the 3 expected trips have been distributed evenly to the AM, PM and evening peak hours.

It is assumed that the deliveries will enter and exit the site within each peak hour, resulting in one inbound and one outbound trip per visit. During the AM peak hour, the larger 20 employee shift will enter the site with the reduced 5 employee overnight staff leaving the site, and vice versa during the PM peak hour. While the evening peak hour is unlikely to experience a significant amount of employee change over, 5 inbound and 5 outbound employees trips applied to account for any shift change obscurities.

The estimated trip generation for the future development is illustrated below in **Table 7**.

Table 7 – Estimated Traffic Generation of Proposed Development

Trip Generator	AM Peak Hour			PM Peak Hour			EVE Peak Hour		
	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
Incoming Substrate	4	4	8	4	4	8	7	7	14
Outbound Digestate	1	1	2	1	1	2	2	2	4
Outbound Clean Organics	1	1	2	1	1	2	2	2	4
Outbound Inorganics	1	1	2	1	1	2	2	2	4
Employees	20	5	25	5	20	25	5	5	10
Total	27	12	39	12	27	39	17	17	34

As indicated, the proposed development operations are conservatively estimated at 39 AM peak hour trips, 39 PM peak hour trips and 34 evening peak hour trips (total of inbound and inbound trips).

For the purpose of our analysis, we have conservatively assumed that all trips, other than employee trips, are heavy vehicles.

4.2 Traffic Assignment

In relation to the surrounding study area, development traffic is expected to make its way to/from higher order roadways (Lawrence Avenue E, Kingston Road, Port Union Road, Highway 401 etc.) via the following access connections:

- Morningside Avenue via Coronation Drive;
- Manse Road; and
- Beechgrove Road.

The expected distribution of development trips is illustrated in **Table 8**.

Table 8 – Proposed Development Traffic Distribution

Travel Direction (to / from)	Percent of Total Traffic Generation
West via Coronation Drive	20%
Northwest via Manse Road	30%
Northeast via Beechgrove Drive	50%
TOTAL	100%

The site traffic assignment for the proposed development for the AM, PM and evening peak hour is illustrated in **Figure 9** (trucks), **Figure 10** (cars) and **Figure 11** (total).

4.3 Traffic Volumes with the Proposed Development

For the total (2020) traffic volumes, the proposed development traffic was added to the existing (2020) traffic volumes. The resulting total (2020) year traffic volumes for the AM, PM and evening peak hour are illustrated in **Figure 12**.

5 Total Traffic Operations

5.1 Total (2020) Intersection Operations

The results of the LOS analysis under total (2020) traffic volumes during the AM, PM and evening peak hour can be found below in **Table 9**.

Table 9 –Total (2020) LOS

Location (E-W Street / N-S Street)	Weekday AM Peak Hour			Weekday PM Peak Hour			Weekday EVE Peak Hour		
	V/C	Delay (s)	LOS	V/C	Delay (s)	LOS	V/C	Delay (s)	LOS
Lawrence Avenue E / Manse Road (signalized)	0.60	14.6	B	0.48	12.2	B	0.20	9.7	A
EBL	0.05	6.9	A	0.14	6.4	A	0.04	3.4	A
EBTR	0.16	7.1	A	0.42	7.8	A	0.15	3.7	A
WBL	0.13	7.7	A	0.37	10.6	B	0.11	4.2	A
WBTR	0.53	10.5	B	0.25	6.9	A	0.09	3.8	A
NBL	0.68	34.9	C	0.61	26.3	C	0.44	25.7	C
NBTR	0.18	19.3	B	0.59	24.3	C	0.32	24.1	C
SBL	0.03	17.8	B	0.11	19.2	B	0.06	21.9	C
SBTR	0.72	27.3	C	0.37	20.8	C	0.22	22.8	C
Lawrence Avenue E / Beechwood Drive (unsignalized)	-	3.9	A	-	4.7	A	-	2.1	A
EBTR	0.09	0.0	-	0.15	0.0	-	0.07	0.0	-
WBL	0.14	8.9	A	0.08	9.5	A	0.03	8.0	A
WBTR	0.20	0.0	-	0.10	0.0	-	0.05	0.0	-
NB	0.54	34.9	D	0.59	27.5	D	0.14	11.1	B
SB	0.01	10.8	B	0.01	9.7	A	0.00	9.4	A
Coronation Drive / Manse Road (unsignalized)	-	10.4	B	-	10.5	B	-	7.9	A
EB	0.25	9.9	A	0.46	11.8	B	0.17	8.2	A
WB	0.22	9.7	A	0.20	8.9	A	0.08	7.6	A
NB	0.06	9.2	A	0.08	9.3	A	0.03	7.9	A
SB	0.45	11.1	B	0.22	9.2	A	0.08	7.6	A
Coronation Drive / Beechwood Drive (unsignalized)	-	2.1	A	-	6.1	A	-	5.3	A
EB	0.06	9.8	A	0.20	10.1	B	0.08	9.2	A
NB	0.01	3.6	A	0.00	0.7	A	0.00	1.5	A
SB	0.13	0.0	-	0.05	0.0	-	0.02	0.0	-

The results of the LOS analysis indicate that all the intersections in the study area are operating at a satisfactory LOS or better for all turning movements.

It is noted that the study area intersections will operate at near identical levels to those experienced under the existing (2020) conditions, indicating that the proposed development will have minimal impact from an operations standpoint. In this regard, it is evident that the study area intersections can support the proposed development volumes with no adverse effects.

Furthermore, given the relatively negligible effects of the additional development traffic volumes, should any of the truck traffic choose to deviate from the assuming travel routes, satisfactory operations or better are expected to prevail.

5.2 Queuing Analysis

A review of the anticipated queuing for the critical movements at the study area intersections was undertaken to evaluate the effect of the additional traffic. The anticipated 95th percentile queue lengths for the existing (2020) and total (2020) traffic scenarios are provided in **Table 10**.

Table 10 – Queuing Analysis

Location (E-W Street / N-S Street)	Available Storage (m)	Weekday AM Peak Hour		Weekday PM Peak Hour		Weekday EVE Peak Hour	
		95% Queue (m)		95% Queue (m)		95% Queue (m)	
		Existing	Total	Existing	Total	Existing	Total
Lawrence Avenue E / Manse Road (signalized)	-	-	-	-	-	-	-
WBL	25 m	12.6	12.6	21.6	22.3	7.6	8.0
NBL	15 m	24.4	25.8	31.0	32.9	14.6	15.8
Lawrence Avenue E / Beechwood Drive (unsignalized)	-	-	-	-	-	-	-
WBL	45 m	3.3	3.7	1.9	2.1	0.5	0.7
NB	-	20.3	22.5	24.6	27.3	3.3	3.8

As indicated, with the addition of the site traffic, a minor increase in 95th percentile queue lengths is expected for all critical movements (in the range of 0.2 to 2.7 metres). In this regard, the proposed development will have a negligible impact to queuing operations.

The 95th percentile queues lengths can be accommodated within the existing storage provided for all critical turning movements with the exception of the northbound left turn movement at the intersection of Lawrence Avenue East / Manse Road. While the northbound queue is expected to exceed the available storage, the queuing overflow will fall within the turn lane's available taper length and upstream of the closest roadway (Mansewood Gardens). As such, the northbound left turn queue length is acceptable and will not impose any operational or traffic safety issues.

It is further noted that in the rare event that an additional truck (23 metres) is added to the peak queuing scenario identified above, the corresponding stacking length would not impose any operational or traffic safety issues.

5.3 24 / 7 Operating Scenario

Further to the 24 hour / 5-day work week daily capacity scenario, an expanded 24 hour / 7-day work week (as presented in the developer's application) has been considered.

Recognizing that the same daily capacity limit would be in effect, daily traffic generated by the development would remain consistent. As such, the 24 hour / 7-day work will have no effect on the weekday volumes, only the weekend volumes.

For urban areas, peak roadway volumes occur during the weekday morning (AM) and afternoon (PM) peak hours as result of typical work day operations and commuter traffic. While weekend traffic volumes may approach the peak volumes in some instances (i.e. within predominately commercial or tourist areas), such is not expected within the study area. Once again noting that the daily development traffic would be consistent regardless of the time of week, the study area intersections are expected to operate with satisfactory or better conditions during the weekend.

6 Summary

Coronation Organics Processing Inc. retained **JD Engineering** to prepare this traffic impact study in support of the proposed 633 Coronation Drive industrial development in the City of Toronto. The proposed Site Plan is shown in **Appendix A**. This chapter summarizes the conclusions and recommendations from the study.

1. The proposed development is expected to generate a total of 39 AM peak hour trips, 39 PM peak hour trips and 34 evening peak hour trips.
2. With timing of this study coinciding with the COVID-19 pandemic, detailed turning movements counts were not commissioned at the study area intersections recognizing that any retrieved data would not reflect typical roadway operations. Rather, historic turning movement counts were obtained from the City and modified appropriately to reflect existing (2020) conditions (detailed in Section 2.3 of this report).
3. An intersection operation analysis was completed at the study area intersections, using the existing (2020) traffic volumes without the proposed development traffic. This enabled a review of existing traffic deficiencies that would be present without the influence of the proposed development. After review, it was determined that the study area intersections are providing satisfactory conditions with available capacity to facilitate additional growth.
4. An estimate of the amount of traffic that would be generated by the Subject Site, operating at a 24 hours / 5 day work week, at a peak capacity of 1240 tonnes/day was prepared and assigned to the study area streets and intersections. The 24/5 operating scenario considered by the developer reflects an approximate processing reduction of 29% in comparison to a 24 hour / 7 day a week.
5. An intersection operation analysis was completed under total (2020) traffic volumes with the proposed development operational at the study area intersections. The analyses indicate that the study area intersections will operate at near identical levels to those experienced under the existing (2020) conditions, indicating that the proposed development will have minimal impact from an operational standpoint.
6. A 24 hour / 7 day work week was reviewed, noting that an increase in daily truck traffic is not expected given the daily capacity restraint. Traffic operations on the weekend is expected to be less critical than the weekday commuter periods analyzed. No operational issues are anticipated as a result of the 24 hour / 7 day week.

In summary, the proposed development will not cause any operational issues and will not add significant delay or congestion to the local roadway network.

Figure 4: Development Traffic – Highland Creek Treatment Plant Expansion

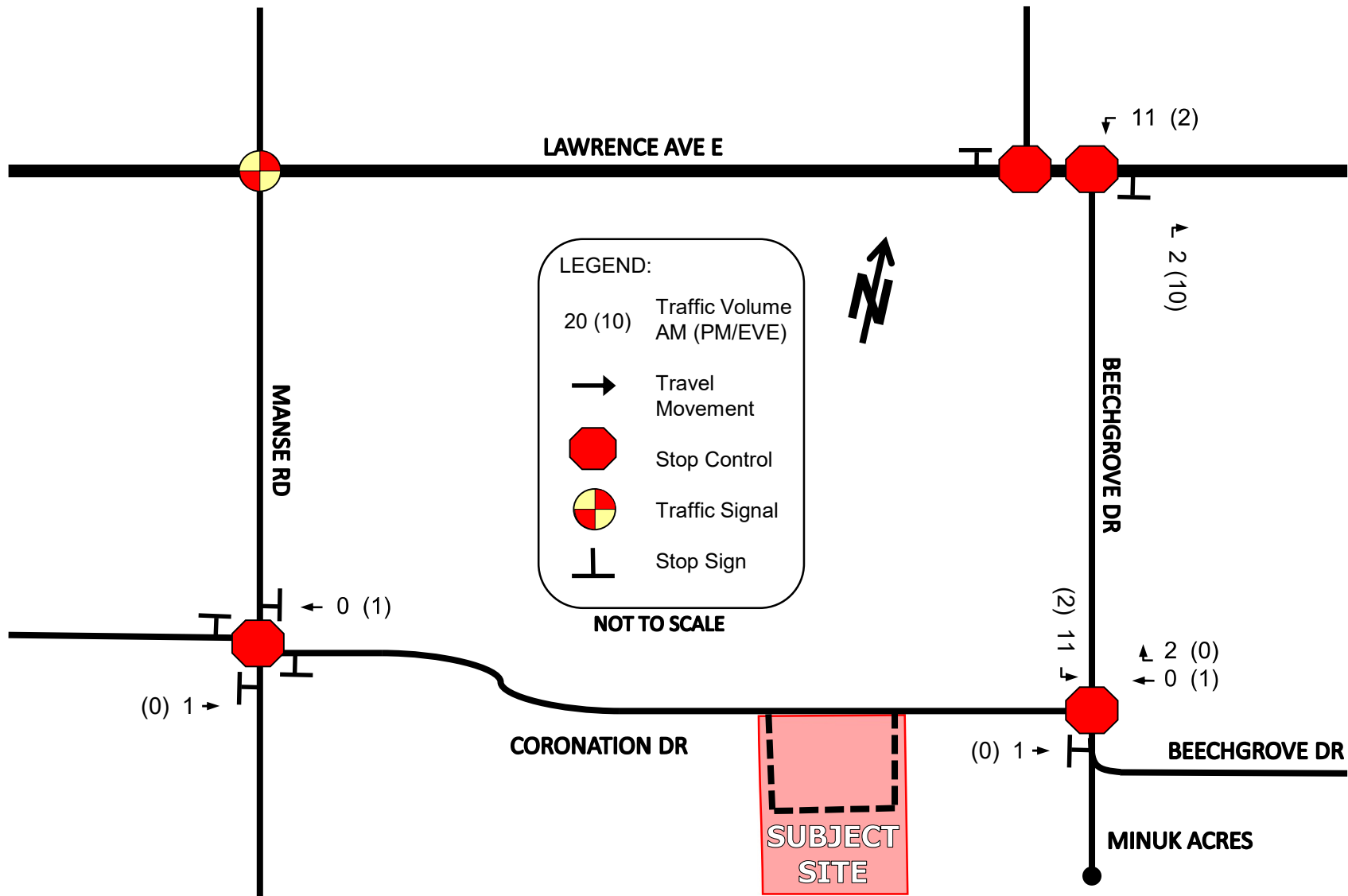


Figure 5: Development Traffic – 280 Manse Road

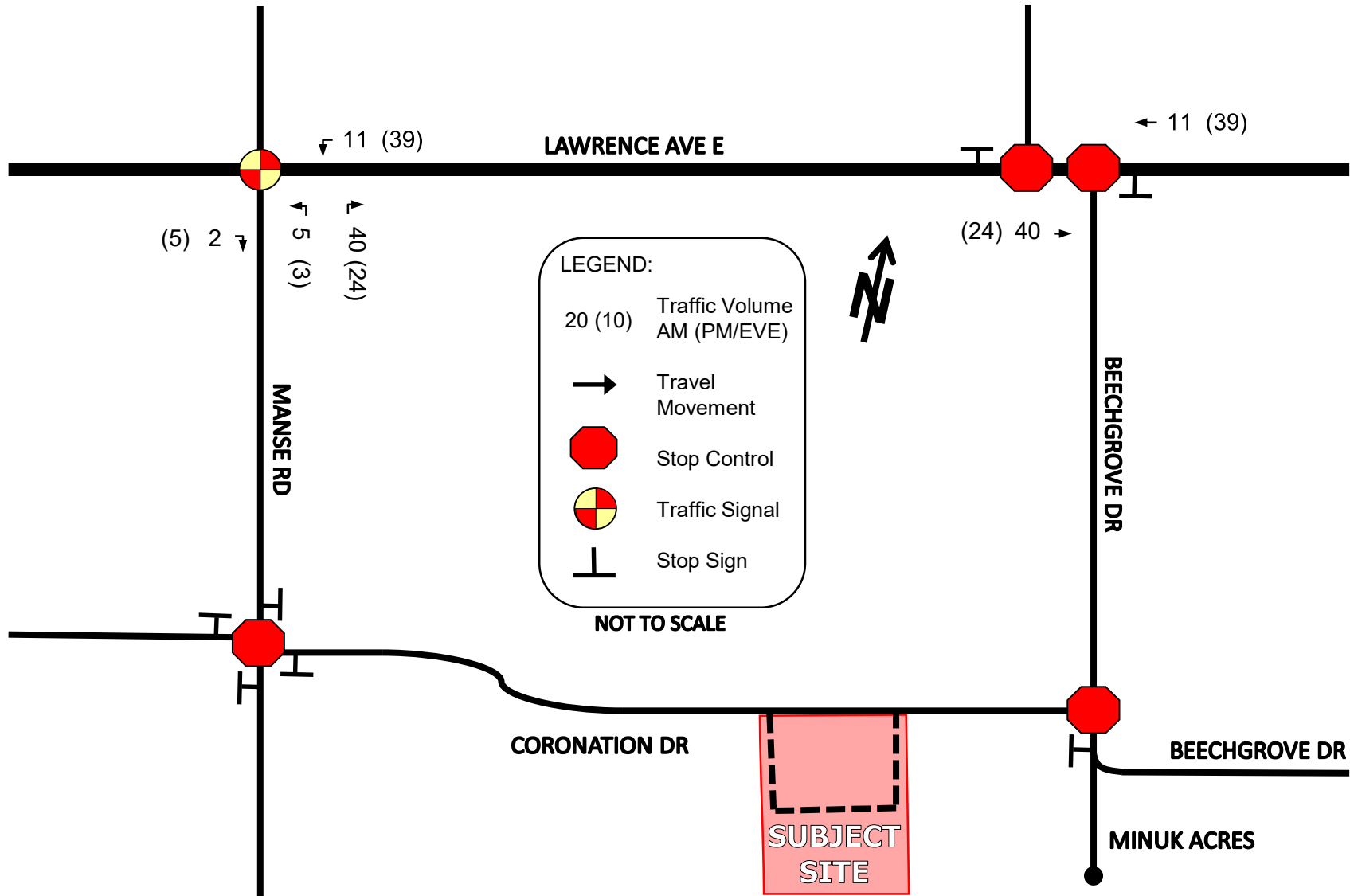


Figure 6: Development Traffic – Asterfield Drive

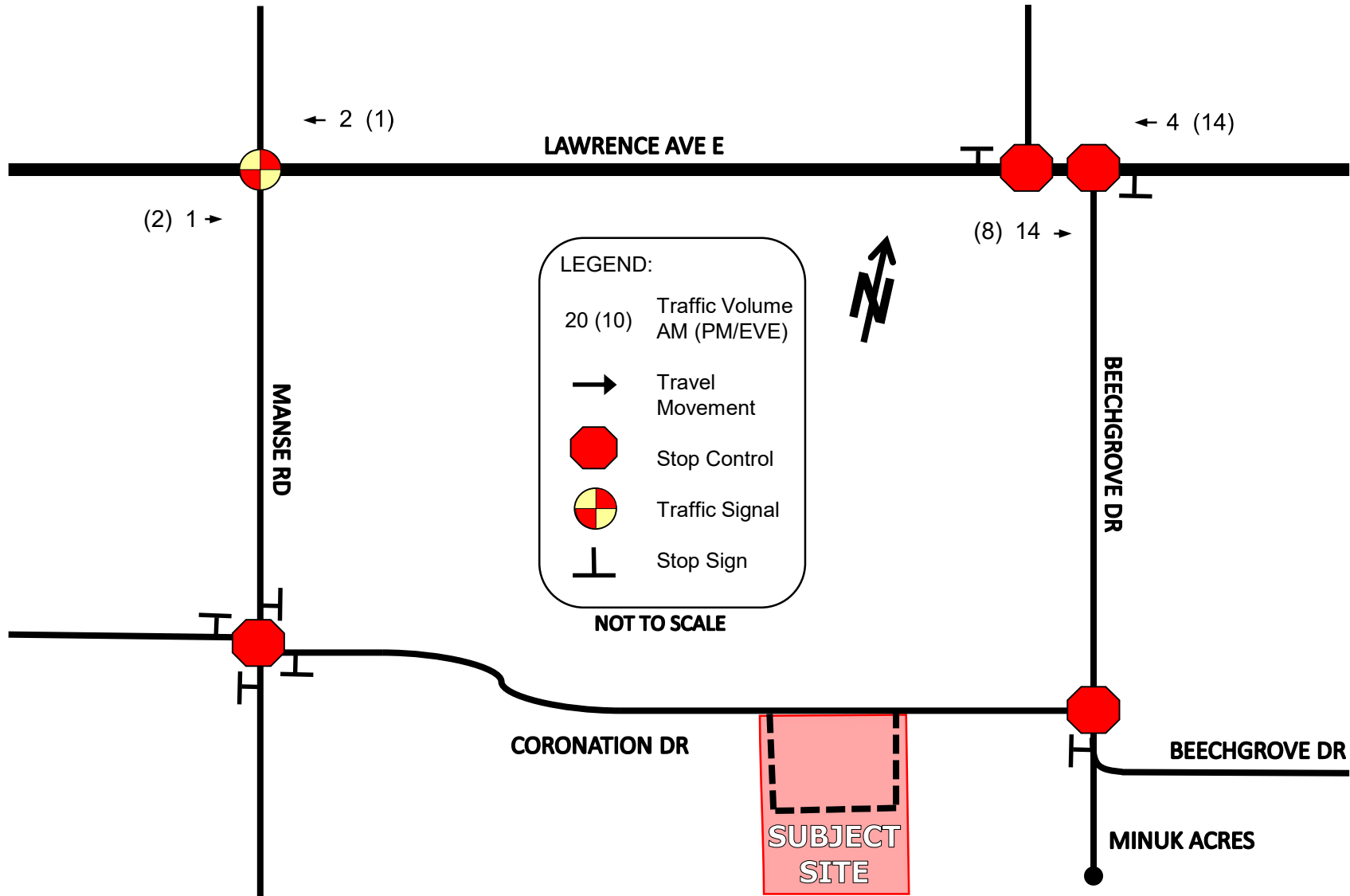


Figure 7: Development Traffic – Woodgrove Drive

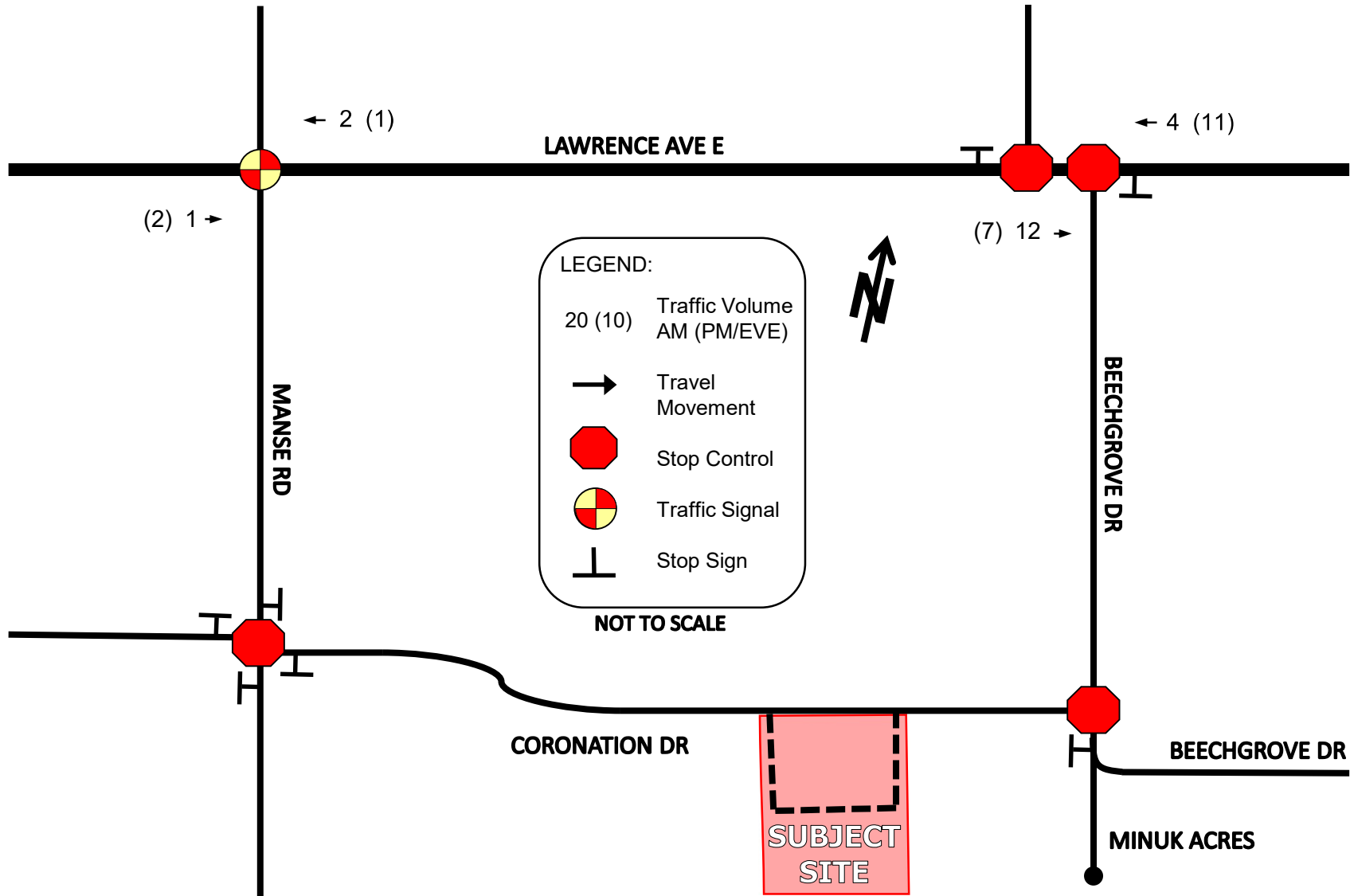


Figure 8: Existing (2020) Traffic Volumes

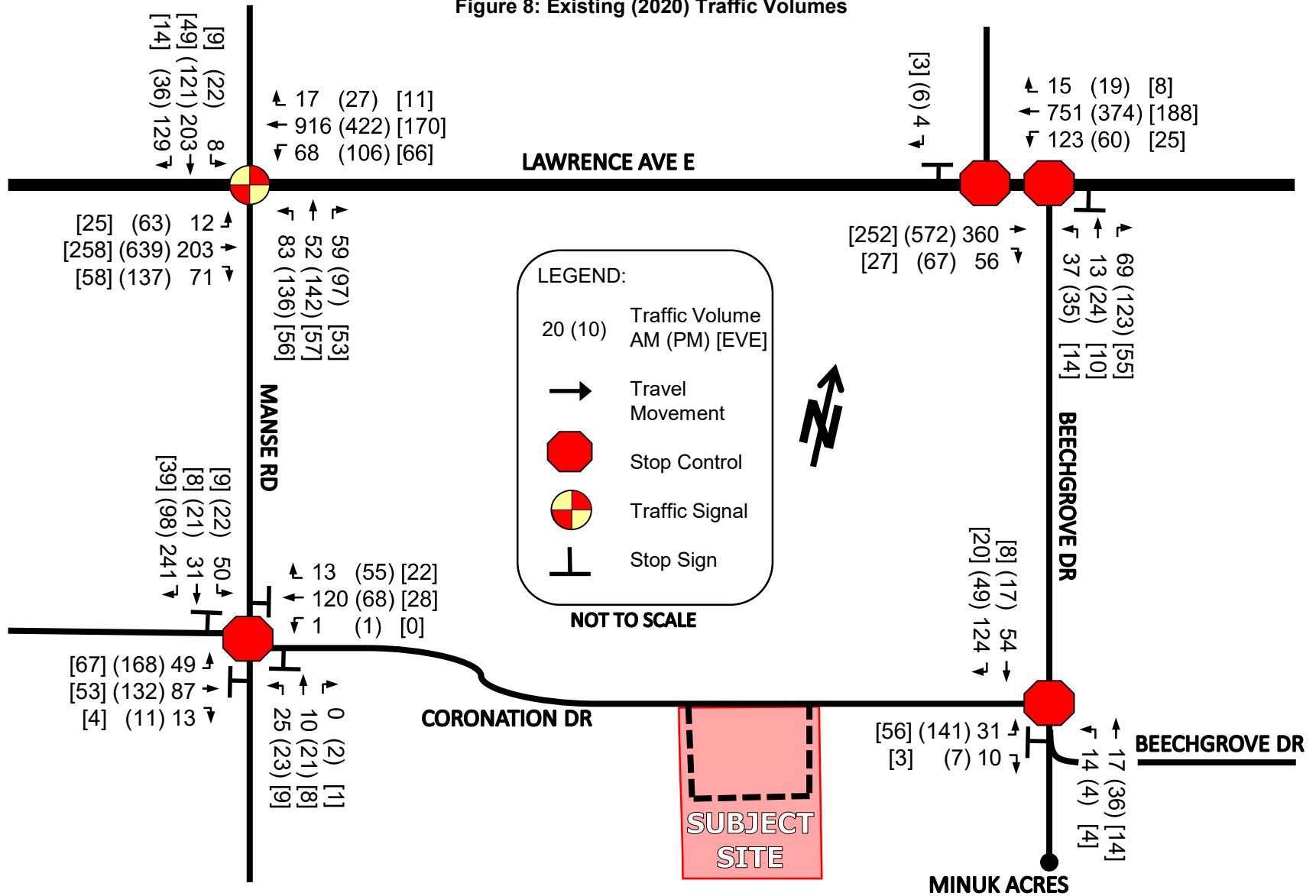


Figure 9: Site Traffic Assignment - Trucks

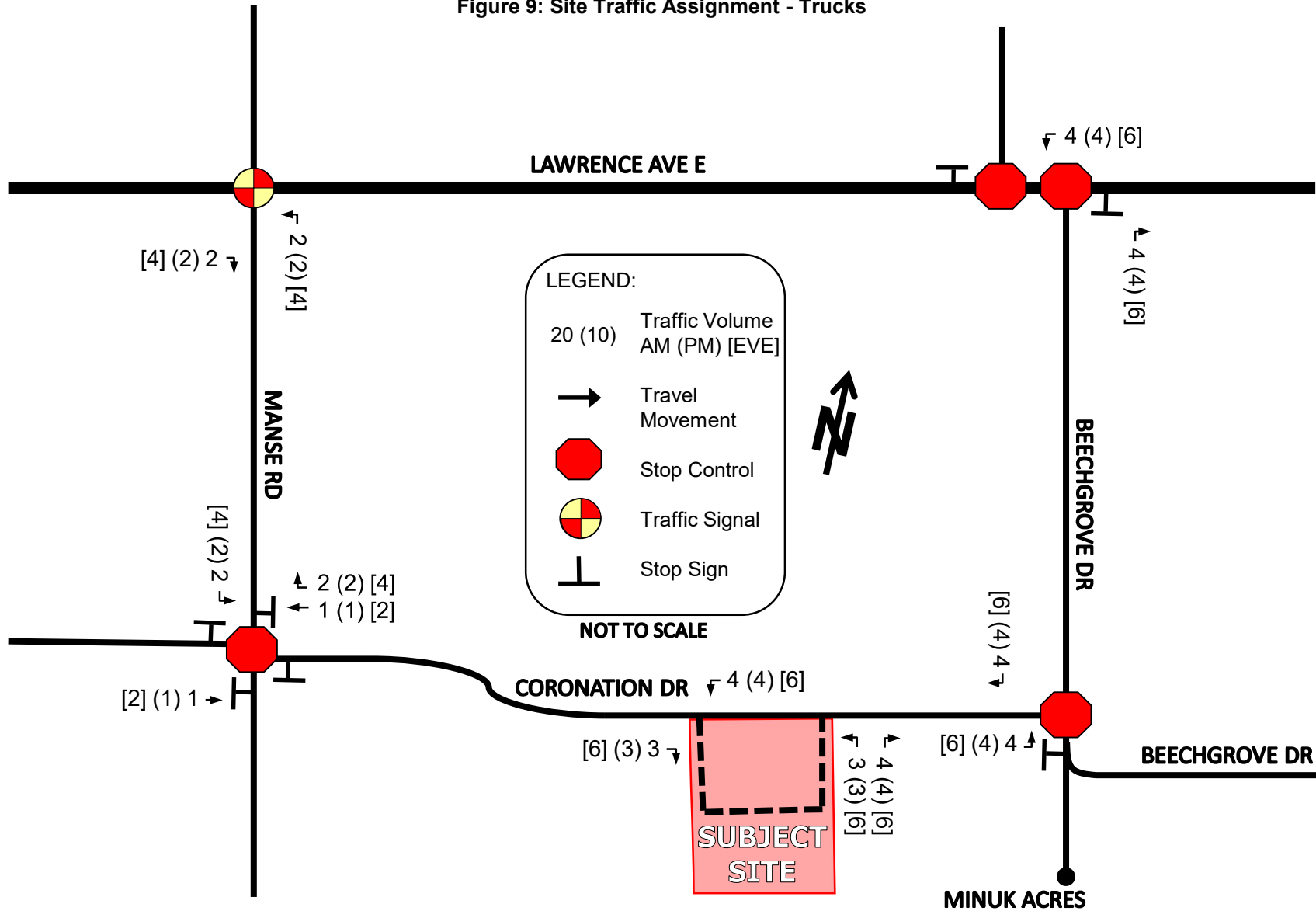


Figure 10: Site Traffic Assignment – Passenger Cars

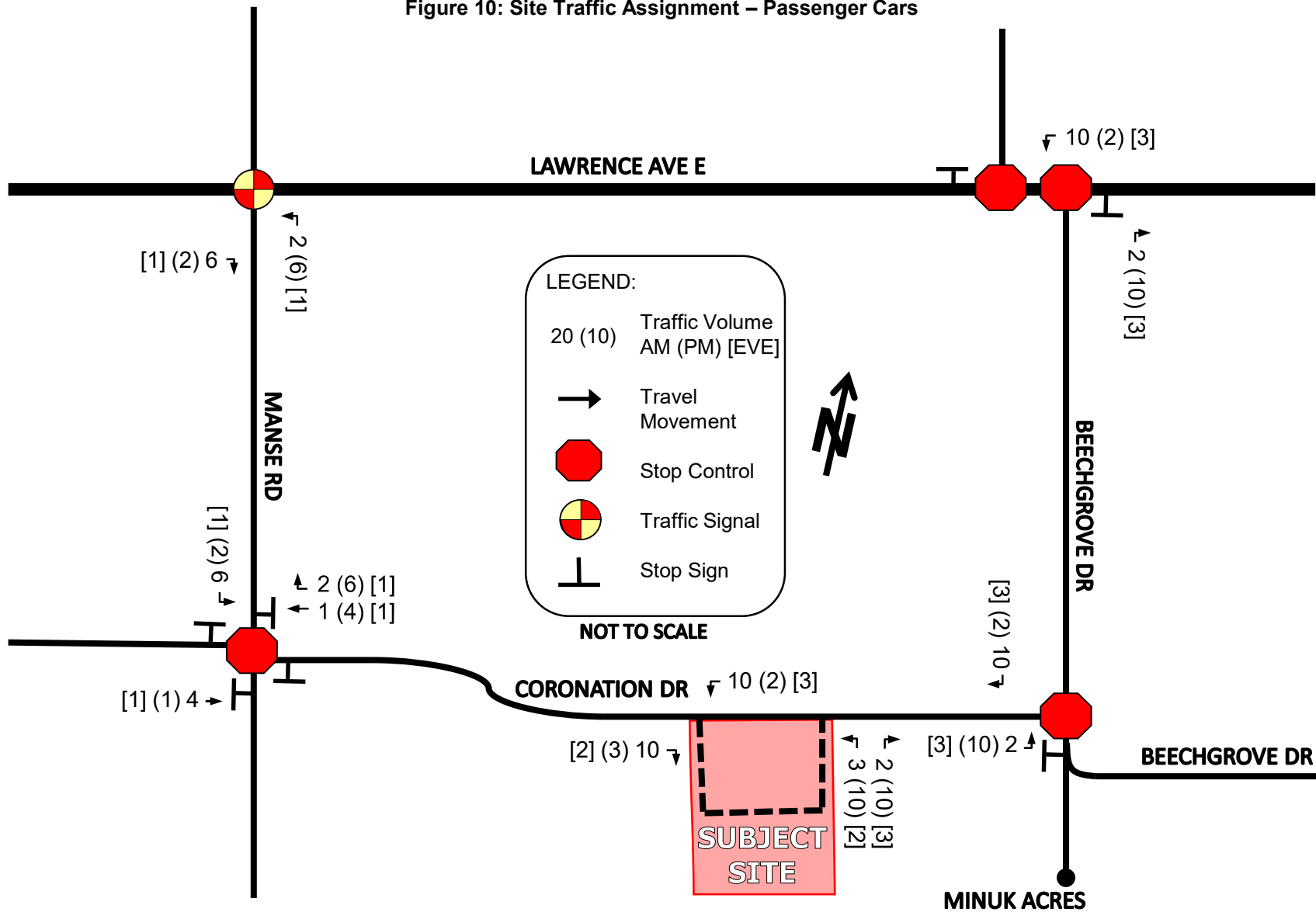


Figure 11: Site Traffic Assignment - Total

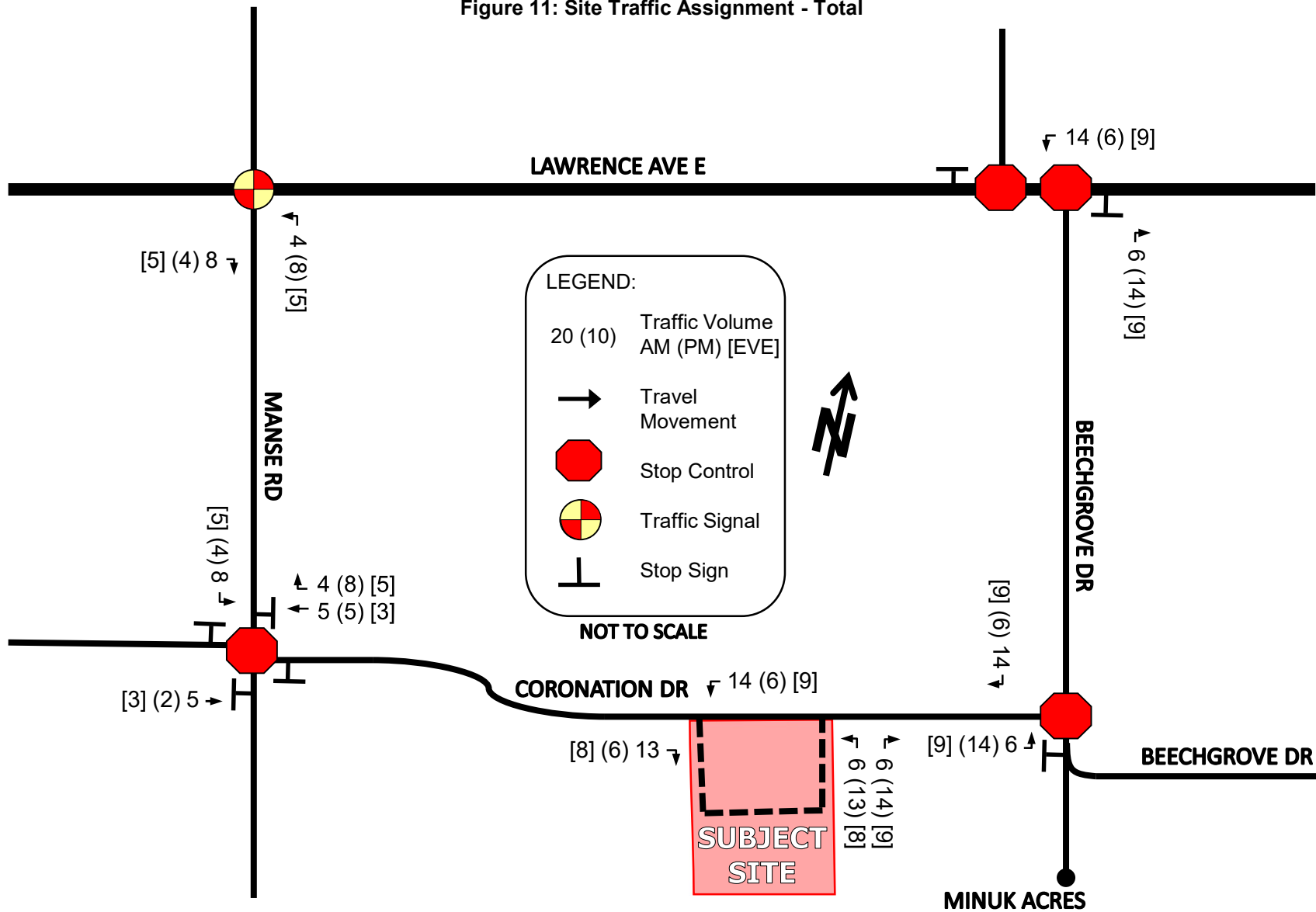
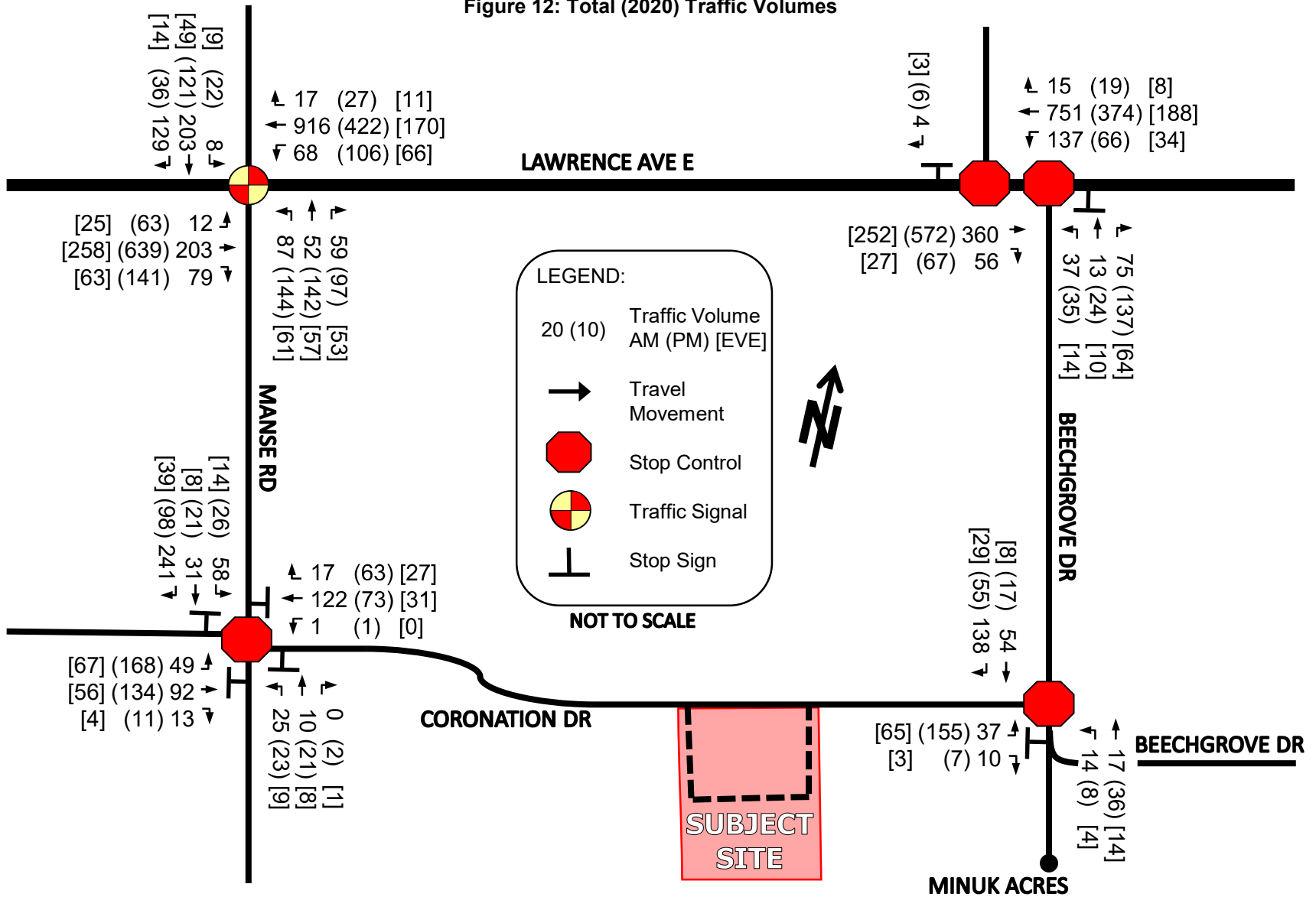
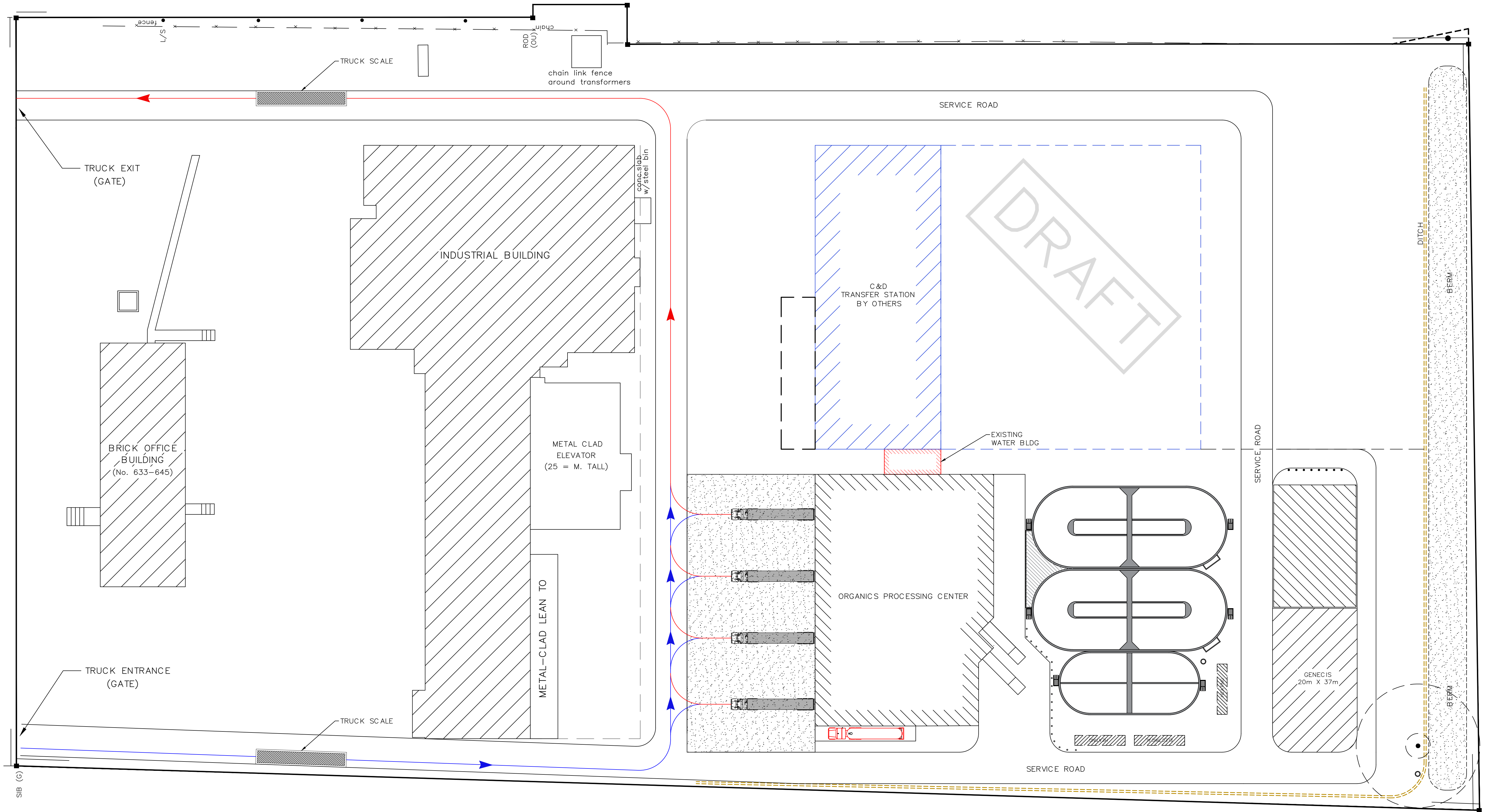
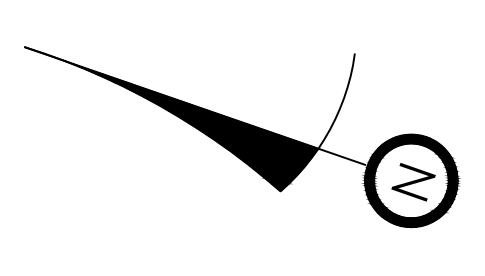


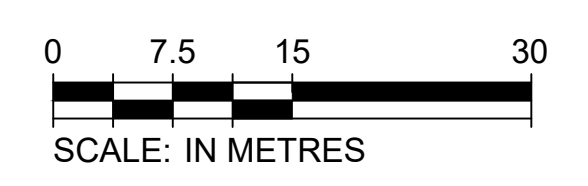
Figure 12: Total (2020) Traffic Volumes



Appendix A – Site Plan



1 TRUCK TRAFFIC
 SP3 AS SHOWN



DRAWING NUMBER: AD-SP3	DRAWING TITLE: TRUCK TRAFFIC	DESIGNED BY: D.L.	CHECKED BY: J.K.B.	DRAWN BY: J.C.	DATE: 3-Dec-19	NO.	REVISION	AUTHOR
		JOB NUMBER: T7C07	SCALE: As Shown	DATE: 12/03/19				
PROJECT: ORGANICS PROCESSING CENTER & ANAEROBIC DIGESTER 633 Coronation Dr Scarborough, ON M1E 2K4					<small>THIS DRAWING IS THE SOLE PROPERTY OF CH FOUR BIOLOGICALS. REPRODUCTION AND/OR DISTRIBUTION IS NOT PERMITTED WITHOUT EXPRESS WRITTEN APPROVAL OF CH FOUR BIOLOGICALS.</small>			
DOCUMENT STATUS:		DATE:	STATUS:	AUTHOR:				

Appendix B – Traffic Count Data

Turning Movement Count Summary Report

BEECHGROVE DR AT CORONATION DR

Survey Date: 2014-Oct-22 (Wednesday)

Survey Type: Routine Hours

Time Period	Vehicle Type	Exits	NORTHBOUND				Total	Exits	EASTBOUND				Total	Exits	SOUTHBOUND				Total	Exits	WESTBOUND				Total	Peds	Bike	Other
			Left	Thru	Right	Total			Left	Thru	Right	Total			Left	Thru	Right	Total			Left	Thru	Right	Total				
08:30-09:30 AM PEAK	CAR	34	3	0	0	3	19	26	2	6	34	27	17	20	110	147	120	1	7	8	16	N	0	0	0			
	TRK	8	2	1	0	3	1	2	0	0	2	1	1	1	3	5	6	0	1	5	6	S	4	0	0			
	BUS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	E	0	0	0			
TOTAL:		42	5	1	0	6	20	28	2	6	36	28	18	21	113	152	126	1	8	13	22							
16:00-17:00 PM PEAK	CAR	155	4	13	0	17	9	126	2	2	130	7	7	5	40	52	47	0	3	16	19	N	2	0	0			
	TRK	4	0	1	0	1	0	3	0	0	3	1	0	1	5	6	5	0	0	0	0	S	0	0	0			
	BUS	3	0	0	0	0	3	0	3	0	3	0	0	0	0	0	0	0	0	3	3	E	0	0	0			
TOTAL:		162	4	14	0	18	12	129	5	2	136	8	7	6	45	58	52	0	3	19	22							
OFF HR AVG	CAR	84	3	8	1	12	18	61	5	2	68	11	12	9	59	80	67	0	5	15	20	N	2	0	0			
	TRK	6	2	2	0	4	1	2	0	0	2	2	1	2	5	8	8	0	1	2	3	S	0	0	0			
	BUS	1	0	0	0	0	0	1	0	0	1	0	0	0	1	1	2	0	1	0	1	E	0	0	0			
TOTAL:		91	5	10	1	16	19	64	5	2	71	13	13	11	65	89	77	0	7	17	24							
07:30-09:30 2 HR AM	CAR	44	9	1	0	10	80	31	13	9	53	44	67	34	141	242	161	1	11	12	24	N	0	0	0			
	TRK	15	2	7	0	9	4	3	0	0	3	2	4	2	7	13	10	0	1	5	6	S	4	0	0			
	BUS	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	E	0	0	0			
TOTAL:		59	11	8	0	19	85	34	14	9	57	46	71	36	148	255	171	1	12	17	30							
16:00-18:00 2 HR PM	CAR	252	10	20	0	30	24	199	9	5	213	11	15	6	92	113	112	0	10	33	43	N	2	0	0			
	TRK	5	0	1	0	1	0	4	0	2	6	9	0	7	10	17	10	0	0	0	0	S	0	0	0			
	BUS	4	0	0	0	0	8	1	8	0	9	0	0	0	0	0	1	0	1	3	4	E	0	0	0			
TOTAL:		261	10	21	0	31	32	204	17	7	228	20	15	13	102	130	123	0	11	36	47							
07:30-18:00 8 HR SUM	CAR	632	30	54	4	88	175	474	42	23	539	100	129	76	467	672	539	1	42	104	147	N	8	0	0			
	TRK	44	8	16	0	24	10	16	1	3	20	21	9	17	35	61	47	1	4	12	17	S	5	0	0			
	BUS	7	0	0	0	0	10	3	10	0	13	0	0	0	3	3	6	0	3	4	7	E	1	0	0			
TOTAL:		683	38	70	4	112	195	493	53	26	572	121	138	93	505	736	592	2	49	120	171							

Total 8 Hour Vehicle Volume: 1,591

Total 8 Hour Bicycle Volume: 0

Total 8 Hour Intersection Volume: 1,591

Comment: ACTUAL HOURS:

Turning Movement Count Summary Report

BEECHGROVE DR AT LAWRENCE AVE

Survey Date: 2017-Feb-08 (Wednesday)

Survey Type: Routine Hours

Time Period	Vehicle Type	Exits	NORTHBOUND				EASTBOUND				SOUTHBOUND				WESTBOUND				Total	Peds	Bike	Other			
			Left	Thru	Right	Total	Exits	Left	Thru	Right	Total	Exits	Left	Thru	Right	Total	Exits	Left					Thru	Right	Total
08:00-09:00 AM PEAK	CAR	25	30	11	55	96	308	0	253	47	300	151	0	0	3	3	695	104	662	14	780	N	2	0	0
	TRK	0	4	0	2	6	12	0	10	3	13	4	0	0	1	1	11	1	6	0	7	S	5	0	0
	BUS	1	1	1	7	9	25	0	18	4	22	6	0	0	0	0	33	2	32	0	34	E	0	1	0
TOTAL:		26	35	12	64	111	345	0	281	54	335	161	0	0	4	4	739	107	700	14	821				
16:30-17:30 PM PEAK	CAR	42	33	23	108	164	598	1	490	53	544	106	0	0	6	6	316	53	277	18	348	N	2	0	0
	TRK	0	0	0	0	0	5	0	5	6	11	8	0	0	0	0	5	2	5	0	7	S	3	0	0
	BUS	0	0	0	0	0	15	0	15	5	20	5	0	0	0	0	14	0	14	0	14	E	0	2	0
TOTAL:		42	33	23	108	164	618	1	510	64	575	119	0	0	6	6	335	55	296	18	369				
OFF HR AVG	CAR	18	33	14	36	83	241	1	205	37	243	68	0	0	5	5	261	31	223	3	257	N	2	0	0
	TRK	1	5	1	2	8	10	0	8	5	13	8	0	0	0	0	13	3	8	0	11	S	3	0	0
	BUS	0	0	0	1	1	8	0	7	2	9	2	0	0	0	0	8	0	8	0	8	E	0	0	0
TOTAL:		19	38	15	39	92	259	1	220	44	265	78	0	0	5	5	282	34	239	3	276				
07:30-09:30 2 HR AM	CAR	43	63	19	89	171	494	0	405	95	500	259	0	0	9	9	1,225	164	1,153	24	1,341	N	2	0	0
	TRK	0	8	0	2	10	28	0	26	12	38	13	0	0	1	1	23	1	14	0	15	S	5	0	0
	BUS	1	1	1	7	9	47	0	40	7	47	9	0	0	0	0	49	2	48	0	50	E	0	1	0
TOTAL:		44	72	20	98	190	569	0	471	114	585	281	0	0	10	10	1,297	167	1,215	24	1,406				
16:00-18:00 2 HR PM	CAR	63	61	40	206	307	1,109	1	903	112	1,016	217	0	0	14	14	628	105	553	22	680	N	3	0	0
	TRK	0	6	0	2	8	10	0	8	7	15	10	0	0	0	0	13	3	7	0	10	S	4	0	0
	BUS	0	0	0	1	1	30	0	29	9	38	9	0	0	0	0	28	0	28	0	28	E	0	2	0
TOTAL:		63	67	40	209	316	1,149	1	940	128	1,069	236	0	0	14	14	669	108	588	22	718				
07:30-18:00 8 HR SUM	CAR	173	257	113	438	808	2,566	4	2,128	355	2,487	748	0	0	42	42	2,897	393	2,598	56	3,047	N	11	0	0
	TRK	2	32	2	13	47	79	0	66	39	105	54	0	0	1	1	87	15	54	0	69	S	20	1	0
	BUS	1	1	1	10	12	105	0	95	24	119	27	0	0	0	0	108	3	107	0	110	E	1	4	0
TOTAL:		176	290	116	461	867	2,750	4	2,289	418	2,711	829	0	0	43	43	3,092	411	2,759	56	3,226				

Total 8 Hour Vehicle Volume: 6,847

Total 8 Hour Bicycle Volume: 9

Total 8 Hour Intersection Volume: 6,856

Comment:

Turning Movement Count Summary Report

CORONATION DR AT MANSE RD

Survey Date: 2014-Oct-22 (Wednesday)
 Survey Type: Routine Hours

Time Period	Vehicle Type	Exits	NORTHBOUND				EASTBOUND				SOUTHBOUND				WESTBOUND				Total	Peds	Bike	Other			
			Left	Thru	Right	Total	Exits	Left	Thru	Right	Total	Exits	Left	Thru	Right	Total	Exits	Left					Thru	Right	Total
08:30-09:30 AM PEAK	CAR	57	18	6	0	24	119	44	75	10	129	39	44	28	219	291	345	1	108	7	116	N	1	0	0
	TRK	9	1	3	0	4	6	1	4	2	7	2	2	0	1	3	3	0	1	5	6	S	0	0	0
	BUS	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	5	0	1	0	1	E	5	0	0
TOTAL:		66	23	9	0	32	125	45	79	12	136	41	46	28	220	294	353	1	110	12	123				
16:00-17:00 PM PEAK	CAR	218	15	19	1	35	139	154	118	8	280	28	20	19	90	129	165	1	60	45	106	N	3	0	0
	TRK	5	0	0	0	0	1	0	1	2	3	2	0	0	0	0	1	0	1	5	6	S	1	0	0
	BUS	0	6	0	1	7	3	0	2	0	2	0	0	0	0	0	6	0	0	0	0	E	6	0	0
TOTAL:		223	21	19	2	42	143	154	121	10	285	30	20	19	90	129	172	1	61	50	112				
OFF HR AVG	CAR	124	9	13	1	23	93	80	69	10	159	22	23	10	88	121	167	2	70	31	103	N	3	0	0
	TRK	10	1	2	0	3	10	1	6	1	8	3	4	2	2	8	10	0	7	7	14	S	1	0	0
	BUS	1	1	0	0	1	0	1	0	1	2	1	0	0	0	0	2	0	1	0	1	E	2	0	0
TOTAL:		135	11	15	1	27	103	82	75	12	169	26	27	12	90	129	179	2	78	38	118				
07:30-09:30 2 HR AM	CAR	88	20	17	2	39	194	60	110	28	198	82	82	52	253	387	398	2	125	11	138	N	2	0	0
	TRK	21	1	5	0	6	10	1	4	3	8	5	6	2	1	9	3	0	1	15	16	S	0	0	0
	BUS	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	5	0	1	0	1	E	7	0	0
TOTAL:		109	25	22	2	49	204	61	114	31	206	87	88	54	254	396	406	2	127	26	155				
16:00-18:00 2 HR PM	CAR	372	27	31	3	61	237	257	195	17	469	52	39	33	161	233	314	2	126	84	212	N	5	0	0
	TRK	10	0	1	0	1	4	0	2	2	4	2	2	0	0	2	2	0	2	9	11	S	1	0	0
	BUS	0	7	0	2	9	9	0	7	1	8	1	0	0	0	0	8	0	1	0	1	E	15	0	0
TOTAL:		382	34	32	5	71	250	257	204	20	481	55	41	33	161	235	324	2	129	93	224				
07:30-18:00 8 HR SUM	CAR	954	81	100	10	191	803	635	579	86	1,300	220	214	123	767	1,104	1,377	11	529	219	759	N	17	0	0
	TRK	70	4	15	0	19	52	4	30	9	43	21	22	11	7	40	40	1	29	51	81	S	3	0	0
	BUS	5	16	0	2	18	9	4	7	4	15	4	0	0	0	0	22	0	6	1	7	E	28	0	0
TOTAL:		1,029	101	115	12	228	864	643	616	99	1,358	245	236	134	774	1,144	1,439	12	564	271	847				

Total 8 Hour Vehicle Volume: 3,577
 Comment: ACTUAL HOURS:

Total 8 Hour Bicycle Volume: 0

Total 8 Hour Intersection Volume: 3,577

Turning Movement Count Summary Report

LAWRENCE AVE AT MANSE RD (PX 983)

Survey Date: 2014-Oct-22 (Wednesday)

Survey Type: Routine Hours

Time Period	Vehicle Type	Exits	NORTHBOUND				Total	Exits	EASTBOUND				Total	Exits	SOUTHBOUND				Total	Exits	WESTBOUND				Total	Peds	Bike	Other
			Left	Thru	Right	Total			Left	Thru	Right	Total			Left	Thru	Right	Total			Left	Thru	Right	Total				
08:30-09:30 AM PEAK	CAR	73	63	46	16	125	178	11	155	60	226	295	7	184	118	309	987	51	806	16	873	N	7	0	0			
	TRK	2	8	2	1	11	30	0	29	3	32	6	0	2	0	2	32	1	24	0	25	S	17	0	0			
	BUS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	0	4	E	5	0	0			
TOTAL:		75	71	48	17	136	208	11	184	63	258	301	7	186	118	311	1,023	52	834	16	902							
16:00-17:00 PM PEAK	CAR	211	118	129	67	314	650	57	564	121	742	293	19	111	33	163	521	61	370	25	456	N	32	0	0			
	TRK	2	4	1	0	5	17	1	16	0	17	0	1	0	0	1	18	0	14	0	14	S	29	0	0			
	BUS	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	E	11	0	0			
TOTAL:		213	122	130	67	319	668	58	581	121	760	293	20	111	33	164	539	61	384	25	470							
OFF HR AVG	CAR	120	82	77	41	200	416	26	359	89	474	204	16	83	28	127	570	32	460	17	509	N	13	0	0			
	TRK	2	7	2	1	10	25	0	24	6	30	8	0	1	1	2	32	1	24	0	25	S	21	0	0			
	BUS	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	1	0	1	0	1	E	6	0	0			
TOTAL:		122	89	79	42	210	442	26	384	95	505	212	16	84	29	129	603	33	485	17	535							
07:30-09:30 2 HR AM	CAR	103	117	69	19	205	279	15	247	94	356	393	13	242	147	402	1,568	57	1,304	19	1,380	N	9	0	0			
	TRK	3	19	3	2	24	55	0	53	9	62	12	0	2	0	2	59	1	40	0	41	S	24	0	0			
	BUS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4	0	4	E	5	0	0			
TOTAL:		106	136	72	21	229	334	15	300	103	418	405	13	244	147	404	1,631	58	1,348	19	1,425							
16:00-18:00 2 HR PM	CAR	361	198	225	110	533	1,221	98	1,074	215	1,387	542	37	210	69	316	1,035	117	768	38	923	N	48	0	0			
	TRK	4	8	2	0	10	35	2	34	2	38	2	1	0	0	1	38	0	30	0	30	S	57	0	0			
	BUS	0	0	0	0	0	4	0	4	0	4	0	0	0	0	0	0	0	0	0	0	E	18	0	0			
TOTAL:		365	206	227	110	543	1,260	100	1,112	217	1,429	544	38	210	69	317	1,073	117	798	38	953							
07:30-18:00 8 HR SUM	CAR	939	641	600	293	1,534	3,161	216	2,756	664	3,636	1,749	112	782	327	1,221	4,879	303	3,911	123	4,337	N	108	0	0			
	TRK	15	56	13	4	73	187	2	181	34	217	44	2	7	3	12	225	3	166	0	169	S	165	0	0			
	BUS	0	0	0	0	0	6	0	6	0	6	0	0	0	0	0	6	0	6	0	6	E	45	0	0			
TOTAL:		954	697	613	297	1,607	3,354	218	2,943	698	3,859	1,793	114	789	330	1,233	5,110	306	4,083	123	4,512							

Total 8 Hour Vehicle Volume: 11,211

Total 8 Hour Bicycle Volume: 0

Total 8 Hour Intersection Volume: 11,211

Comment: ACTUAL HOURS:

Graphical 24-Hour Count Summary Report

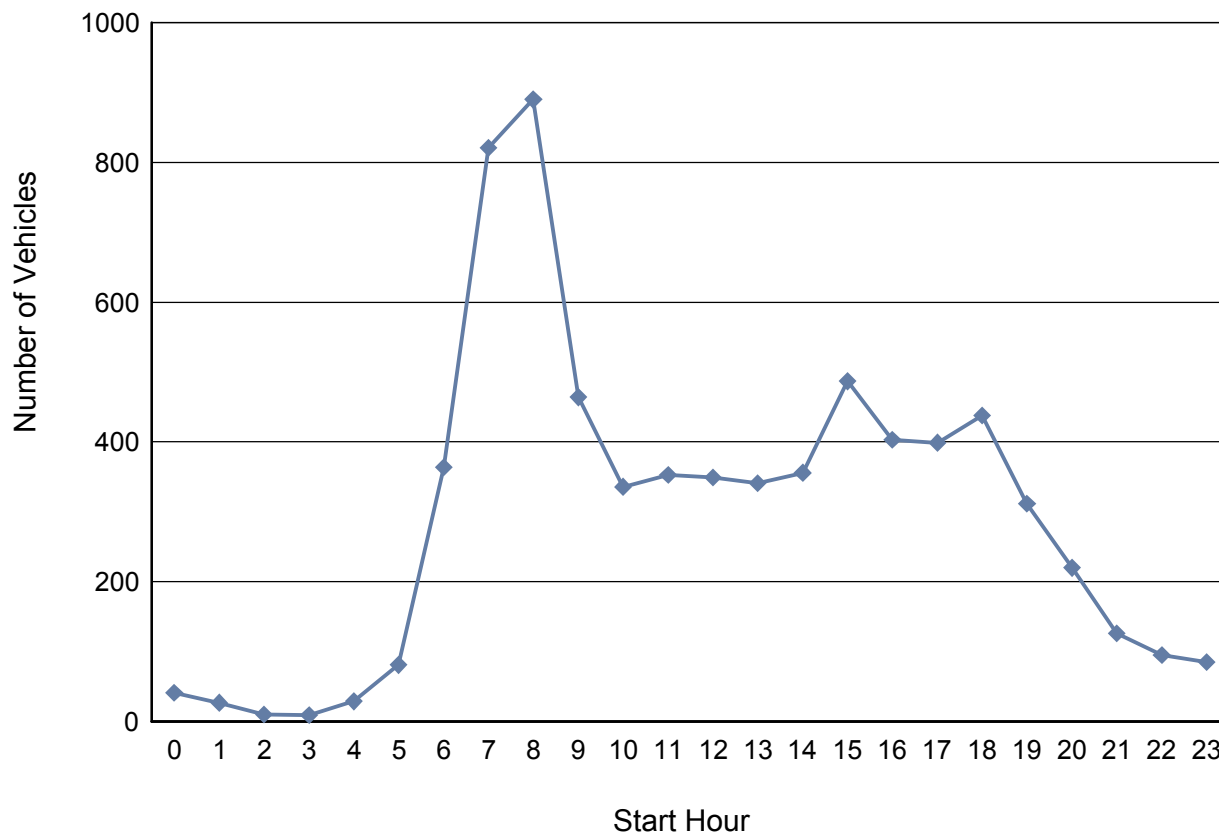
LAWRENCE AVE W/B E OF BENNETT RD

Station Number: 3219

Westbound

Artery Code: 3219

Category: 24 HOUR



Survey Date: Tue, November 8, 2011

Start Hour By Hour Volume:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
41	27	10	9	29	81	364	821	890	464	336	353	349	341	356	487	403	399	438	312	220	126	95	85

Comment:

Graphical 24-Hour Count Summary Report

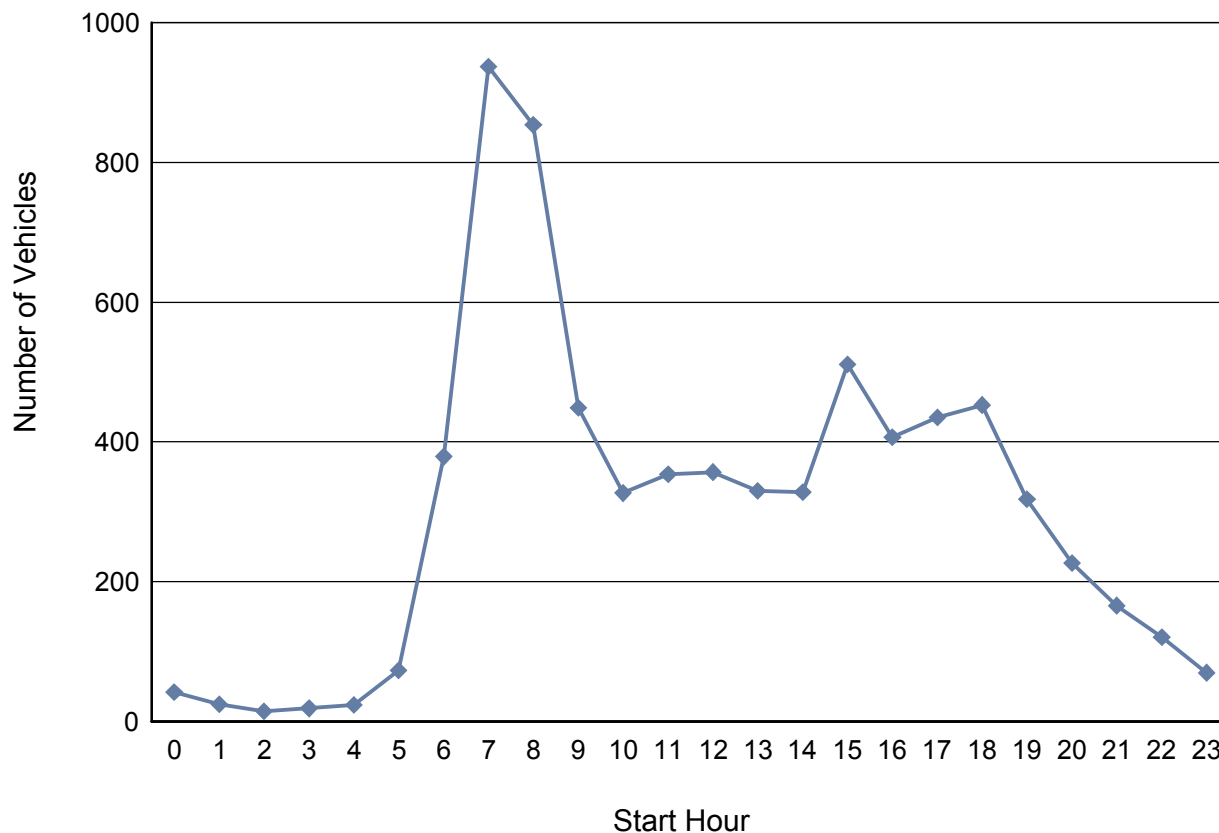
LAWRENCE AVE W/B E OF BENNETT RD

Station Number: 3219

Westbound

Artery Code: 3219

Category: 24 HOUR



Survey Date: Wed, November 9, 2011

Start Hour By Hour Volume:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
42	25	15	19	24	73	379	937	854	449	327	354	357	330	328	511	407	435	453	318	227	166	121	70

Comment:

Graphical 24-Hour Count Summary Report

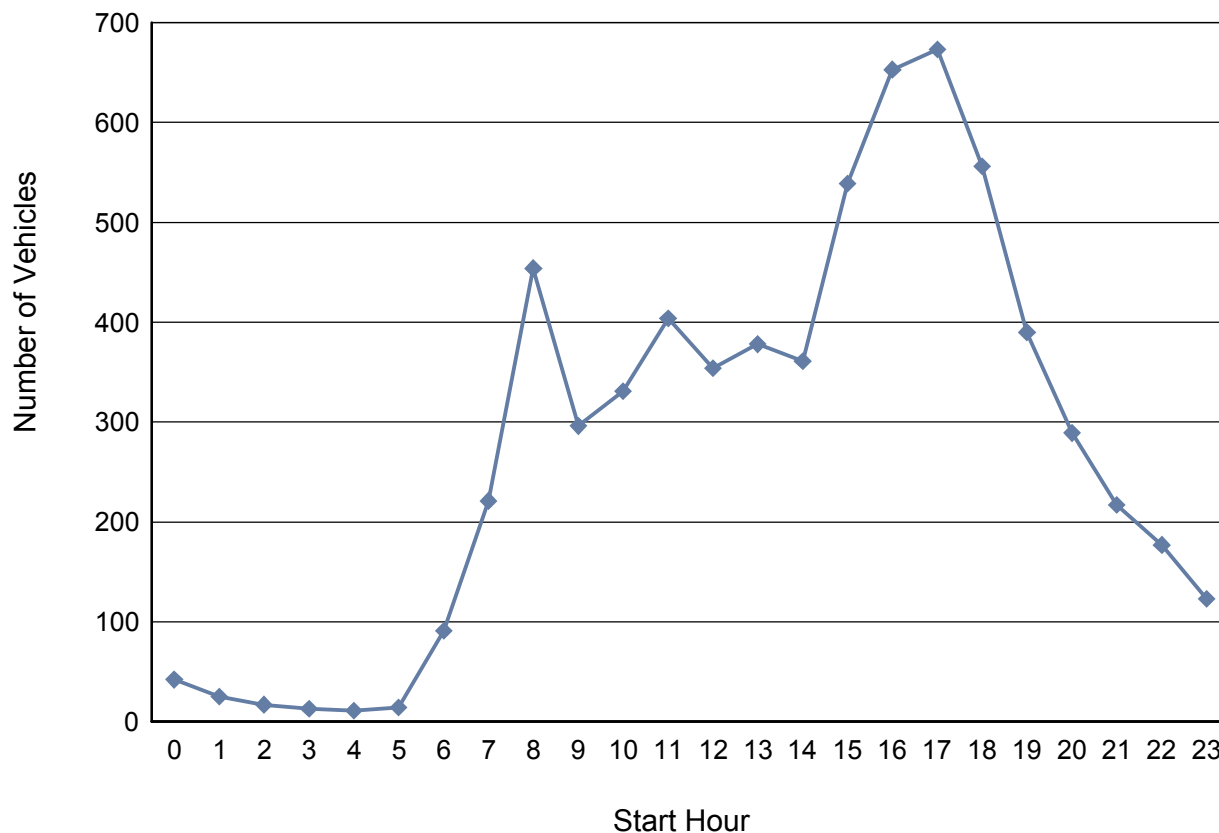
LAWRENCE AVE E/B W OF BENNETT RD

Station Number: 3218

Eastbound

Artery Code: 3218

Category: 24 HOUR



Survey Date: Tue, November 8, 2011

Start Hour By Hour Volume:

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>
42	25	17	13	11	14	91	221	454	296	331	404	354	378	361	539	653	673	556	390	289	217	177	123

Comment:

Graphical 24-Hour Count Summary Report

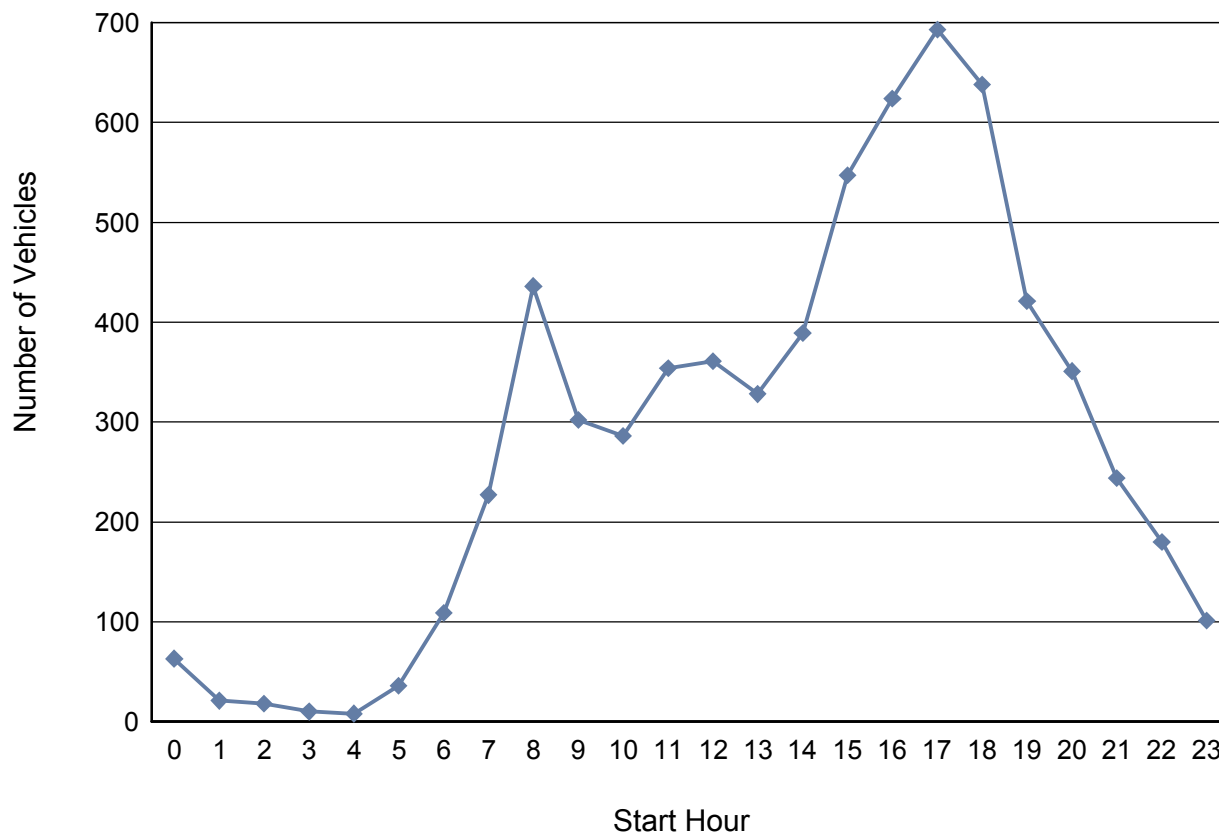
LAWRENCE AVE E/B W OF BENNETT RD

Station Number: 3218

Eastbound

Artery Code: 3218

Category: 24 HOUR



Survey Date: Wed, November 9, 2011

Start Hour By Hour Volume:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
63	21	18	10	8	36	109	227	436	302	286	354	361	328	389	547	624	693	638	421	351	244	180	101

Comment:

Graphical 24-Hour Count Summary Report

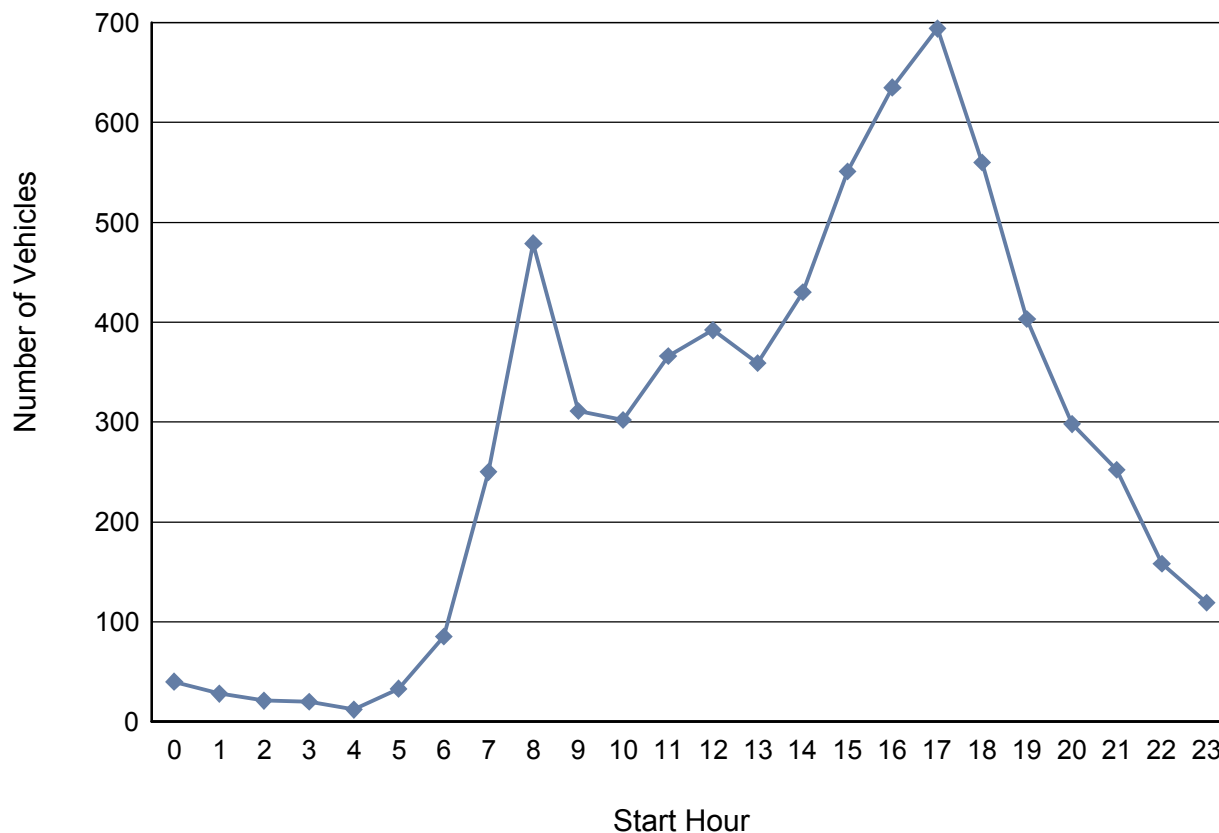
LAWRENCE AVE E/B W OF BENNETT RD

Station Number: 3218

Eastbound

Artery Code: 3218

Category: 24 HOUR



Survey Date: Thu, November 10, 2011

Start Hour By Hour Volume:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
40	28	21	20	12	33	85	250	479	311	302	366	392	359	430	551	635	694	560	403	298	252	158	119

Comment:

Appendix C – Transportation Tomorrow Survey – Excerpt

2006 GTA Zone of Origin: 570

Planning District of Destination		Distribution				Total
		N	S	E	W	
PD 1 of Toronto	506	506				506
PD 2 of Toronto	10	10				10
PD 3 of Toronto	30	30				30
PD 4 of Toronto	86	86				86
PD 5 of Toronto	94	94				94
PD 6 of Toronto	275	275				275
PD 7 of Toronto	44	44				44
PD 8 of Toronto	32	32				32
PD 11 of Toronto	152	152				152
PD 12 of Toronto	56	56				56
PD 13 of Toronto	468			468		468
PD 14 of Toronto	52			52		52
PD 15 of Toronto	1541	616.4		308	616	1541
PD 16 of Toronto	196	196				196
Pickering	201			201		201
Ajax	58			58		58
Oshawa	14			14		14
Richmond Hill	32	32				32
Whitchurch-Stouffville	32	32				32
Markham	27	27				27
Vaughan	62	62				62
Mississauga	9	9				9
Clearview	16	16				16
Kawartha Lakes	23			23		23
						0
Totals	4016	2275	0	604	1136	4016
Distribution %		57%	0%	15%	28%	100%

Note: Trips to North and East reflect vehicles making their way to Highway 401

Thu Jun 18 2020 12:16:47 GMT-0400 (Eastern Daylight Time) - Run Time:

Cross Tabulation Query Form - Trip - 2016 v1.1

Row: 2006 GTA zone of origin - gta06_orig
 Column: Planning district of destination - pd_dest

Filters:
 (Start time of trip - start_time In 600-900
 and
 2006 GTA zone of origin - gta06_orig In 570)

Trip 2016

ROW : gta06_orig
 COLUMN : pd_dest

gta06_orig	pd_dest	total
570	1	506
570	2	10
570	3	30
570	4	86
570	5	94
570	6	275
570	7	44
570	8	32
570	11	152
570	12	56
570	13	468
570	14	52
570	15	1541
570	16	196
570	20	201
570	21	58
570	23	14
570	29	32
570	30	32
570	31	27
570	33	62
570	36	9
570	87	16
570	89	23
570	999	8

Appendix D – Synchro Analysis Output – Existing Traffic Volumes

Queues
1: Manse Rd & Lawrence Ave E

633 Coronation Dr
Existing (2020) - AM



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	13	305	76	1037	92	124	9	369
v/c Ratio	0.05	0.17	0.13	0.53	0.65	0.26	0.03	0.74
Control Delay	9.5	6.3	9.7	11.6	43.5	11.3	16.8	28.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.5	6.3	9.7	11.6	43.5	11.3	16.8	28.7
Queue Length 50th (m)	0.7	6.1	4.1	38.0	9.9	5.4	0.8	35.5
Queue Length 95th (m)	3.6	14.8	12.6	70.0	24.4	16.1	3.6	61.0
Internal Link Dist (m)		129.2		141.4		122.2		101.2
Turn Bay Length (m)	25.0		25.0		15.0		20.0	
Base Capacity (vph)	237	1745	573	1941	267	830	621	875
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	0.05	0.17	0.13	0.53	0.34	0.15	0.01	0.42

Intersection Summary

HCM Signalized Intersection Capacity Analysis
 1: Manse Rd & Lawrence Ave E

633 Coronation Dr
 Existing (2020) - AM



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (vph)	12	203	71	68	916	17	83	52	59	8	203	129
Future Volume (vph)	12	203	71	68	916	17	83	52	59	8	203	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3		6.1	6.1		6.8	6.8		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		0.98	1.00		0.98	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	1.00		1.00	0.92		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1786	3051		1760	3533		1603	1668		1783	1744	
Flt Permitted	0.23	1.00		0.57	1.00		0.33	1.00		0.68	1.00	
Satd. Flow (perm)	424	3051		1048	3533		562	1668		1271	1744	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	13	226	79	76	1018	19	92	58	66	9	226	143
RTOR Reduction (vph)	0	35	0	0	1	0	0	49	0	0	34	0
Lane Group Flow (vph)	13	270	0	76	1036	0	92	75	0	9	335	0
Confl. Peds. (#/hr)	7		17	17		7	36		5	5		36
Heavy Vehicles (%)	2%	16%	7%	2%	3%	2%	12%	4%	6%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	36.9	36.9		36.1	36.1		16.7	16.7		17.5	17.5	
Effective Green, g (s)	36.9	36.9		36.1	36.1		16.7	16.7		17.5	17.5	
Actuated g/C Ratio	0.56	0.56		0.55	0.55		0.25	0.25		0.27	0.27	
Clearance Time (s)	5.3	5.3		6.1	6.1		6.8	6.8		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	238	1713		575	1941		142	423		338	464	
v/s Ratio Prot		0.09			c0.29			0.04			c0.19	
v/s Ratio Perm	0.03			0.07			0.16			0.01		
v/c Ratio	0.05	0.16		0.13	0.53		0.65	0.18		0.03	0.72	
Uniform Delay, d1	6.5	6.9		7.2	9.4		21.9	19.1		17.8	21.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.2		0.5	1.1		9.8	0.2		0.0	5.5	
Delay (s)	6.9	7.1		7.7	10.5		31.6	19.3		17.8	27.3	
Level of Service	A	A		A	B		C	B		B	C	
Approach Delay (s)		7.1			10.3			24.6			27.1	
Approach LOS		A			B			C			C	

Intersection Summary		
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.60	B
Actuated Cycle Length (s)	65.7	Sum of lost time (s)
Intersection Capacity Utilization	90.0%	12.9
Analysis Period (min)	15	ICU Level of Service
		E

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
2: Beechgrove Dr & Lawrence Ave E

633 Coronation Dr
Existing (2020) - AM



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑		↑	↑↑↑			↑				↑
Traffic Volume (veh/h)	0	360	56	123	751	15	37	13	69	0	0	4
Future Volume (Veh/h)	0	360	56	123	751	15	37	13	69	0	0	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	400	62	137	834	17	41	14	77	0	0	4
Pedestrians		11						5			2	
Lane Width (m)		3.7						3.7			3.7	
Walking Speed (m/s)		1.1						1.1			1.1	
Percent Blockage		1						0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	853			467			1003	1563	169	1336	1586	300
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	853			467			1003	1563	169	1336	1586	300
tC, single (s)	4.1			4.2			7.8	6.7	7.2	7.5	6.5	7.4
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.5
p0 queue free %	100			87			74	85	90	100	100	99
cM capacity (veh/h)	780			1078			158	91	805	81	95	625
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1			
Volume Total	160	160	142	137	334	334	184	132	4			
Volume Left	0	0	0	137	0	0	0	41	0			
Volume Right	0	0	62	0	0	0	17	77	4			
cSH	1700	1700	1700	1078	1700	1700	1700	259	625			
Volume to Capacity	0.09	0.09	0.08	0.13	0.20	0.20	0.11	0.51	0.01			
Queue Length 95th (m)	0.0	0.0	0.0	3.3	0.0	0.0	0.0	20.3	0.1			
Control Delay (s)	0.0	0.0	0.0	8.8	0.0	0.0	0.0	32.5	10.8			
Lane LOS				A				D	B			
Approach Delay (s)	0.0			1.2				32.5	10.8			
Approach LOS								D	B			
Intersection Summary												
Average Delay			3.5									
Intersection Capacity Utilization			39.5%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 3: Manse Rd & Coronation Dr

633 Coronation Dr
 Existing (2020) - AM



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	49	87	13	1	120	13	25	10	0	50	31	241
Future Volume (vph)	49	87	13	1	120	13	25	10	0	50	31	241
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	54	97	14	1	133	14	28	11	0	56	34	268

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	165	148	39	358
Volume Left (vph)	54	1	28	56
Volume Right (vph)	14	14	0	268
Hadj (s)	0.10	0.04	0.57	-0.38
Departure Headway (s)	5.2	5.1	5.8	4.4
Degree Utilization, x	0.24	0.21	0.06	0.44
Capacity (veh/h)	641	642	566	772
Control Delay (s)	9.8	9.5	9.1	10.8
Approach Delay (s)	9.8	9.5	9.1	10.8
Approach LOS	A	A	A	B

Intersection Summary			
Delay		10.2	
Level of Service		B	
Intersection Capacity Utilization	44.8%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 4: Beechgrove Dr & Coronation Dr

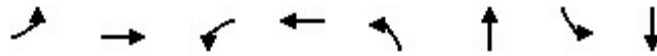
633 Coronation Dr
 Existing (2020) - AM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	31	10	14	17	54	124
Future Volume (Veh/h)	31	10	14	17	54	124
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	34	11	16	19	60	138
Pedestrians	7					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	1					
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	187	136	205			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	187	136	205			
tC, single (s)	6.5	6.2	4.6			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.7			
p0 queue free %	96	99	99			
cM capacity (veh/h)	774	906	1119			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	45	35	198			
Volume Left	34	16	0			
Volume Right	11	0	138			
cSH	803	1119	1700			
Volume to Capacity	0.06	0.01	0.12			
Queue Length 95th (m)	1.4	0.3	0.0			
Control Delay (s)	9.8	3.8	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.8	3.8	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			2.1			
Intersection Capacity Utilization			23.4%	ICU Level of Service	A	
Analysis Period (min)			15			

Queues
1: Manse Rd & Lawrence Ave E

633 Coronation Dr
Existing (2020) - Evening



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	28	351	73	201	62	122	10	70
v/c Ratio	0.03	0.14	0.11	0.08	0.32	0.40	0.05	0.23
Control Delay	4.5	3.7	5.3	4.3	26.0	16.7	20.0	18.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.5	3.7	5.3	4.3	26.0	16.7	20.0	18.6
Queue Length 50th (m)	0.9	5.0	2.5	3.3	5.8	5.8	0.9	4.8
Queue Length 95th (m)	3.4	10.6	7.6	7.4	14.6	17.6	4.1	13.6
Internal Link Dist (m)		129.2		141.4		122.2		101.2
Turn Bay Length (m)	25.0		25.0		15.0		20.0	
Base Capacity (vph)	801	2427	688	2414	507	710	497	739
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	0.14	0.11	0.08	0.12	0.17	0.02	0.09

Intersection Summary

HCM Signalized Intersection Capacity Analysis
 1: Manse Rd & Lawrence Ave E

633 Coronation Dr
 Existing (2020) - Evening



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (vph)	25	258	58	66	170	11	56	57	53	9	49	14
Future Volume (vph)	25	258	58	66	170	11	56	57	53	9	49	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3		6.1	6.1		6.8	6.8		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	0.97	1.00		0.98	1.00		0.98	1.00		0.99	1.00	
Frt	1.00	0.97		1.00	0.99		1.00	0.93		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1732	3417		1747	3469		1741	1729		1725	1806	
Flt Permitted	0.63	1.00		0.54	1.00		0.71	1.00		0.68	1.00	
Satd. Flow (perm)	1140	3417		996	3469		1304	1729		1233	1806	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	28	287	64	73	189	12	62	63	59	10	54	16
RTOR Reduction (vph)	0	18	0	0	4	0	0	52	0	0	14	0
Lane Group Flow (vph)	28	333	0	73	197	0	62	70	0	10	56	0
Confl. Peds. (#/hr)	32		29	29		32	24		11	11		24
Heavy Vehicles (%)	2%	3%	2%	2%	4%	2%	3%	2%	2%	5%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	39.1	39.1		38.3	38.3		7.1	7.1		7.9	7.9	
Effective Green, g (s)	39.1	39.1		38.3	38.3		7.1	7.1		7.9	7.9	
Actuated g/C Ratio	0.67	0.67		0.66	0.66		0.12	0.12		0.14	0.14	
Clearance Time (s)	5.3	5.3		6.1	6.1		6.8	6.8		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	764	2291		654	2278		158	210		167	244	
v/s Ratio Prot		c0.10			0.06			0.04			0.03	
v/s Ratio Perm	0.02			0.07			c0.05			0.01		
v/c Ratio	0.04	0.15		0.11	0.09		0.39	0.33		0.06	0.23	
Uniform Delay, d1	3.2	3.5		3.7	3.6		23.6	23.4		22.0	22.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1		0.3	0.1		1.6	0.9		0.2	0.5	
Delay (s)	3.3	3.6		4.0	3.7		25.2	24.4		22.1	23.0	
Level of Service	A	A		A	A		C	C		C	C	
Approach Delay (s)		3.6			3.8			24.7			22.9	
Approach LOS		A			A			C			C	

Intersection Summary		
HCM 2000 Control Delay	9.6	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.19	A
Actuated Cycle Length (s)	58.3	Sum of lost time (s)
Intersection Capacity Utilization	64.5%	12.9
Analysis Period (min)	15	ICU Level of Service
		C

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
2: Beechgrove Dr & Lawrence Ave E

633 Coronation Dr
Existing (2020) - Evening



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑		↑	↑↑↑			↑				↑
Traffic Volume (veh/h)	0	252	27	25	188	8	14	10	55	0	0	3
Future Volume (Veh/h)	0	252	27	25	188	8	14	10	55	0	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	280	30	28	209	9	16	11	61	0	0	3
Pedestrians		6						3			2	
Lane Width (m)		3.7						3.7			3.7	
Walking Speed (m/s)		1.1						1.1			1.1	
Percent Blockage		1						0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	220			313			433	574	111	431	584	82
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	220			313			433	574	111	431	584	82
tC, single (s)	4.1			4.2			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			97	97	93	100	100	100
cM capacity (veh/h)	1344			1226			490	416	918	454	410	953
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1			
Volume Total	112	112	86	28	84	84	51	88	3			
Volume Left	0	0	0	28	0	0	0	16	0			
Volume Right	0	0	30	0	0	0	9	61	3			
cSH	1700	1700	1700	1226	1700	1700	1700	701	953			
Volume to Capacity	0.07	0.07	0.05	0.02	0.05	0.05	0.03	0.13	0.00			
Queue Length 95th (m)	0.0	0.0	0.0	0.5	0.0	0.0	0.0	3.3	0.1			
Control Delay (s)	0.0	0.0	0.0	8.0	0.0	0.0	0.0	10.9	8.8			
Lane LOS				A				B	A			
Approach Delay (s)	0.0			0.9				10.9	8.8			
Approach LOS								B	A			
Intersection Summary												
Average Delay			1.9									
Intersection Capacity Utilization			30.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 3: Manse Rd & Coronation Dr

633 Coronation Dr
 Existing (2020) - Evening



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	67	53	4	0	28	22	9	8	1	9	8	39
Future Volume (vph)	67	53	4	0	28	22	9	8	1	9	8	39
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	74	59	4	0	31	24	10	9	1	10	9	43

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	137	55	20	62
Volume Left (vph)	74	0	10	10
Volume Right (vph)	4	24	1	43
Hadj (s)	0.13	-0.17	0.37	-0.35
Departure Headway (s)	4.3	4.1	4.8	4.0
Degree Utilization, x	0.16	0.06	0.03	0.07
Capacity (veh/h)	823	862	715	856
Control Delay (s)	8.1	7.3	7.9	7.3
Approach Delay (s)	8.1	7.3	7.9	7.3
Approach LOS	A	A	A	A

Intersection Summary			
Delay		7.7	
Level of Service		A	
Intersection Capacity Utilization	26.2%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 4: Beachgrove Dr/Beechgrove Dr & Coronation Dr

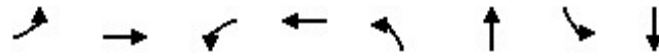
633 Coronation Dr
 Existing (2020) - Evening



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	56	3	4	14	8	20
Future Volume (Veh/h)	56	3	4	14	8	20
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	62	3	4	16	9	22
Pedestrians					2	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.1	
Percent Blockage					0	
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	46	20	31			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	46	20	31			
tC, single (s)	6.4	6.4	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.5	2.2			
p0 queue free %	94	100	100			
cM capacity (veh/h)	960	1016	1582			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	65	20	31			
Volume Left	62	4	0			
Volume Right	3	0	22			
cSH	962	1582	1700			
Volume to Capacity	0.07	0.00	0.02			
Queue Length 95th (m)	1.6	0.1	0.0			
Control Delay (s)	9.0	1.5	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.0	1.5	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			5.3			
Intersection Capacity Utilization			14.2%	ICU Level of Service	A	
Analysis Period (min)			15			

Queues
1: Manse Rd & Lawrence Ave E

633 Coronation Dr
Existing (2020) - PM



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	70	862	118	499	151	266	24	174
v/c Ratio	0.14	0.42	0.37	0.25	0.60	0.65	0.11	0.41
Control Delay	7.9	8.0	12.8	7.4	32.2	25.3	19.5	20.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.9	8.0	12.8	7.4	32.2	25.3	19.5	20.4
Queue Length 50th (m)	3.1	22.8	6.3	12.5	15.6	22.3	2.2	14.7
Queue Length 95th (m)	10.4	45.3	21.6	25.8	31.0	42.1	7.1	28.8
Internal Link Dist (m)		129.2		141.4		122.2		101.2
Turn Bay Length (m)	25.0		25.0		15.0		20.0	
Base Capacity (vph)	507	2036	321	2010	594	905	490	941
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	0.14	0.42	0.37	0.25	0.25	0.29	0.05	0.18

Intersection Summary

HCM Signalized Intersection Capacity Analysis
 1: Manse Rd & Lawrence Ave E

633 Coronation Dr
 Existing (2020) - PM



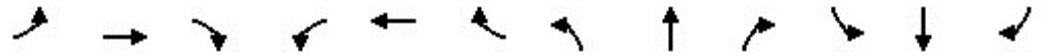
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	639	137	106	422	27	136	142	97	22	121	36
Future Volume (vph)	63	639	137	106	422	27	136	142	97	22	121	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3		6.1	6.1		6.8	6.8		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	0.98	1.00		0.99	1.00		0.98	1.00		0.99	1.00	
Frt	1.00	0.97		1.00	0.99		1.00	0.94		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1749	3419		1769	3469		1744	1754		1727	1805	
Flt Permitted	0.47	1.00		0.30	1.00		0.65	1.00		0.52	1.00	
Satd. Flow (perm)	864	3419		557	3469		1188	1754		952	1805	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	70	710	152	118	469	30	151	158	108	24	134	40
RTOR Reduction (vph)	0	17	0	0	5	0	0	39	0	0	17	0
Lane Group Flow (vph)	70	845	0	118	494	0	151	227	0	24	157	0
Confl. Peds. (#/hr)	32		29	29		32	24		11	11		24
Heavy Vehicles (%)	2%	3%	2%	2%	4%	2%	3%	2%	2%	5%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	36.9	36.9		36.1	36.1		13.3	13.3		14.1	14.1	
Effective Green, g (s)	36.9	36.9		36.1	36.1		13.3	13.3		14.1	14.1	
Actuated g/C Ratio	0.59	0.59		0.58	0.58		0.21	0.21		0.23	0.23	
Clearance Time (s)	5.3	5.3		6.1	6.1		6.8	6.8		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	511	2025		322	2010		253	374		215	408	
v/s Ratio Prot		c0.25			0.14			c0.13			0.09	
v/s Ratio Perm	0.08			0.21			0.13			0.03		
v/c Ratio	0.14	0.42		0.37	0.25		0.60	0.61		0.11	0.38	
Uniform Delay, d1	5.6	6.9		7.0	6.4		22.1	22.1		19.1	20.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	0.6		3.2	0.3		3.8	2.8		0.2	0.6	
Delay (s)	6.2	7.5		10.2	6.7		25.8	24.9		19.4	21.0	
Level of Service	A	A		B	A		C	C		B	C	
Approach Delay (s)		7.4			7.4			25.2			20.8	
Approach LOS		A			A			C			C	

Intersection Summary		
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.47	B
Actuated Cycle Length (s)	62.3	Sum of lost time (s)
Intersection Capacity Utilization	82.7%	12.9
Analysis Period (min)	15	ICU Level of Service
		E

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
2: Beechgrove Dr & Lawrence Ave E

633 Coronation Dr
Existing (2020) - PM



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑		↑	↑↑↑			↑				↑
Traffic Volume (veh/h)	0	572	67	60	374	19	35	24	123	0	0	6
Future Volume (Veh/h)	0	572	67	60	374	19	35	24	123	0	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	636	74	67	416	21	39	27	137	0	0	7
Pedestrians		6						3			2	
Lane Width (m)		3.7						3.7			3.7	
Walking Speed (m/s)		1.1						1.1			1.1	
Percent Blockage		1						0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	439			713			962	1249	252	925	1276	157
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	439			713			962	1249	252	925	1276	157
tC, single (s)	4.1			4.2			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			92			80	83	82	100	100	99
cM capacity (veh/h)	1115			867			194	158	745	149	152	854
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1			
Volume Total	254	254	201	67	166	166	104	203	7			
Volume Left	0	0	0	67	0	0	0	39	0			
Volume Right	0	0	74	0	0	0	21	137	7			
cSH	1700	1700	1700	867	1700	1700	1700	365	854			
Volume to Capacity	0.15	0.15	0.12	0.08	0.10	0.10	0.06	0.56	0.01			
Queue Length 95th (m)	0.0	0.0	0.0	1.9	0.0	0.0	0.0	24.6	0.2			
Control Delay (s)	0.0	0.0	0.0	9.5	0.0	0.0	0.0	26.5	9.3			
Lane LOS				A				D	A			
Approach Delay (s)	0.0			1.3				26.5	9.3			
Approach LOS								D	A			
Intersection Summary												
Average Delay			4.3									
Intersection Capacity Utilization			43.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 3: Manse Rd & Coronation Dr

633 Coronation Dr
 Existing (2020) - PM



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	168	132	11	1	68	55	23	21	2	22	21	98
Future Volume (vph)	168	132	11	1	68	55	23	21	2	22	21	98
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	187	147	12	1	76	61	26	23	2	24	23	109

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	346	138	51	156
Volume Left (vph)	187	1	26	24
Volume Right (vph)	12	61	2	109
Hadj (s)	0.13	-0.17	0.38	-0.35
Departure Headway (s)	4.7	4.7	5.7	4.8
Degree Utilization, x	0.46	0.18	0.08	0.21
Capacity (veh/h)	725	713	566	678
Control Delay (s)	11.7	8.7	9.2	9.1
Approach Delay (s)	11.7	8.7	9.2	9.1
Approach LOS	B	A	A	A

Intersection Summary			
Delay		10.3	
Level of Service		B	
Intersection Capacity Utilization	44.3%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis
 4: Beachgrove Dr/Beechgrove Dr & Coronation Dr

633 Coronation Dr
 Existing (2020) - PM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	141	7	4	36	17	49
Future Volume (Veh/h)	141	7	4	36	17	49
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	157	8	4	40	19	54
Pedestrians						2
Lane Width (m)						3.7
Walking Speed (m/s)						1.1
Percent Blockage						0
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	96	46	73			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	96	46	73			
tC, single (s)	6.4	6.4	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.5	2.2			
p0 queue free %	83	99	100			
cM capacity (veh/h)	899	982	1527			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	165	44	73			
Volume Left	157	4	0			
Volume Right	8	0	54			
cSH	903	1527	1700			
Volume to Capacity	0.18	0.00	0.04			
Queue Length 95th (m)	5.1	0.1	0.0			
Control Delay (s)	9.9	0.7	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.9	0.7	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			5.9			
Intersection Capacity Utilization			20.1%	ICU Level of Service	A	
Analysis Period (min)			15			

Appendix E – Synchro Analysis Output – Total Traffic Volumes

Queues
1: Manse Rd & Lawrence Ave E

633 Coronation Dr
Total (2020) - Evening



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	28	357	73	201	68	122	10	70
v/c Ratio	0.04	0.15	0.11	0.08	0.36	0.38	0.05	0.22
Control Delay	4.8	3.8	5.6	4.5	27.0	16.2	19.8	18.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.8	3.8	5.6	4.5	27.0	16.2	19.8	18.2
Queue Length 50th (m)	0.9	5.2	2.6	3.4	6.4	5.8	0.9	4.8
Queue Length 95th (m)	3.6	11.3	8.0	7.7	15.8	17.5	4.1	13.5
Internal Link Dist (m)		129.2		141.4		122.2		101.2
Turn Bay Length (m)	25.0		25.0		15.0		20.0	
Base Capacity (vph)	795	2387	679	2397	472	706	495	735
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	0.04	0.15	0.11	0.08	0.14	0.17	0.02	0.10

Intersection Summary

HCM Signalized Intersection Capacity Analysis
 1: Manse Rd & Lawrence Ave E

























633 Coronation Dr
 Total (2020) - Evening

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	258	63	66	170	11	61	57	53	9	49	14
Future Volume (vph)	25	258	63	66	170	11	61	57	53	9	49	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3		6.1	6.1		6.8	6.8		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	0.97	1.00		0.98	1.00		0.98	1.00		0.99	1.00	
Frt	1.00	0.97		1.00	0.99		1.00	0.93		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1732	3381		1747	3469		1630	1729		1725	1806	
Flt Permitted	0.63	1.00		0.54	1.00		0.71	1.00		0.68	1.00	
Satd. Flow (perm)	1140	3381		990	3469		1221	1729		1232	1806	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	28	287	70	73	189	12	68	63	59	10	54	16
RTOR Reduction (vph)	0	21	0	0	4	0	0	52	0	0	14	0
Lane Group Flow (vph)	28	336	0	73	197	0	68	70	0	10	56	0
Confl. Peds. (#/hr)	32		29	29		32	24		11	11		24
Heavy Vehicles (%)	2%	3%	6%	2%	4%	2%	10%	2%	2%	5%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	39.0	39.0		38.2	38.2		7.4	7.4		8.2	8.2	
Effective Green, g (s)	39.0	39.0		38.2	38.2		7.4	7.4		8.2	8.2	
Actuated g/C Ratio	0.67	0.67		0.65	0.65		0.13	0.13		0.14	0.14	
Clearance Time (s)	5.3	5.3		6.1	6.1		6.8	6.8		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	760	2254		646	2265		154	218		172	253	
v/s Ratio Prot		c0.10			0.06			0.04			0.03	
v/s Ratio Perm	0.02			0.07			c0.06			0.01		
v/c Ratio	0.04	0.15		0.11	0.09		0.44	0.32		0.06	0.22	
Uniform Delay, d1	3.3	3.6		3.8	3.7		23.6	23.3		21.8	22.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1		0.4	0.1		2.0	0.9		0.1	0.4	
Delay (s)	3.4	3.7		4.2	3.8		25.7	24.1		21.9	22.8	
Level of Service	A	A		A	A		C	C		C	C	
Approach Delay (s)		3.7			3.9			24.7			22.7	
Approach LOS		A			A			C			C	
Intersection Summary												
HCM 2000 Control Delay			9.7				HCM 2000 Level of Service			A		
HCM 2000 Volume to Capacity ratio			0.20									
Actuated Cycle Length (s)			58.5				Sum of lost time (s)			12.9		
Intersection Capacity Utilization			64.5%				ICU Level of Service			C		
Analysis Period (min)			15									

c Critical Lane Group

















HCM Unsignalized Intersection Capacity Analysis
2: Beechgrove Dr & Lawrence Ave E

633 Coronation Dr
Total (2020) - Evening

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  		  				  				  
Traffic Volume (veh/h)	0	252	27	34	188	8	14	10	64	0	0	3
Future Volume (Veh/h)	0	252	27	34	188	8	14	10	64	0	0	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	280	30	38	209	9	16	11	71	0	0	3
Pedestrians		6						3			2	
Lane Width (m)		3.7						3.7			3.7	
Walking Speed (m/s)		1.1						1.1			1.1	
Percent Blockage		1						0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	220			313			453	594	111	461	604	82
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	220			313			453	594	111	461	604	82
tC, single (s)	4.1			4.2			7.5	6.6	7.2	7.5	6.5	7.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.5	3.5	4.0	3.8
p0 queue free %	100			97			97	97	92	100	100	100
cM capacity (veh/h)	1344			1226			471	398	872	422	396	815
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1			
Volume Total	112	112	86	38	84	84	51	98	3			
Volume Left	0	0	0	38	0	0	0	16	0			
Volume Right	0	0	30	0	0	0	9	71	3			
cSH	1700	1700	1700	1226	1700	1700	1700	685	815			
Volume to Capacity	0.07	0.07	0.05	0.03	0.05	0.05	0.03	0.14	0.00			
Queue Length 95th (m)	0.0	0.0	0.0	0.7	0.0	0.0	0.0	3.8	0.1			
Control Delay (s)	0.0	0.0	0.0	8.0	0.0	0.0	0.0	11.1	9.4			
Lane LOS				A				B	A			
Approach Delay (s)	0.0			1.2				11.1	9.4			
Approach LOS								B	A			
Intersection Summary												
Average Delay			2.1									
Intersection Capacity Utilization			31.5%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 3: Manse Rd & Coronation Dr

633 Coronation Dr
 Total (2020) - Evening

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	67	56	4	0	31	27	9	8	1	14	8	39
Future Volume (vph)	67	56	4	0	31	27	9	8	1	14	8	39
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	74	62	4	0	34	30	10	9	1	16	9	43
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	140	64	20	68								
Volume Left (vph)	74	0	10	16								
Volume Right (vph)	4	30	1	43								
Hadj (s)	0.16	-0.03	0.37	-0.19								
Departure Headway (s)	4.3	4.2	4.8	4.2								
Degree Utilization, x	0.17	0.08	0.03	0.08								
Capacity (veh/h)	811	826	707	816								
Control Delay (s)	8.2	7.6	7.9	7.6								
Approach Delay (s)	8.2	7.6	7.9	7.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.9									
Level of Service			A									
Intersection Capacity Utilization			26.7%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 4: Beachgrove Dr/Beechgrove Dr & Coronation Dr

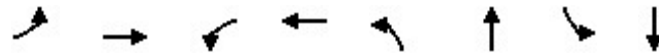
633 Coronation Dr
 Total (2020) - Evening



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	65	3	4	14	8	29
Future Volume (Veh/h)	65	3	4	14	8	29
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	72	3	4	16	9	32
Pedestrians						2
Lane Width (m)						3.7
Walking Speed (m/s)						1.1
Percent Blockage						0
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	51	25	41			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	51	25	41			
tC, single (s)	6.5	6.8	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.8	2.2			
p0 queue free %	92	100	100			
cM capacity (veh/h)	931	906	1568			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	75	20	41			
Volume Left	72	4	0			
Volume Right	3	0	32			
cSH	930	1568	1700			
Volume to Capacity	0.08	0.00	0.02			
Queue Length 95th (m)	2.0	0.1	0.0			
Control Delay (s)	9.2	1.5	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.2	1.5	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			5.3			
Intersection Capacity Utilization			14.7%	ICU Level of Service	A	
Analysis Period (min)			15			

Queues
1: Manse Rd & Lawrence Ave E

633 Coronation Dr
Total (2020) - PM

























Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	70	867	118	499	160	266	24	174
v/c Ratio	0.14	0.43	0.37	0.25	0.62	0.63	0.11	0.40
Control Delay	8.2	8.3	13.4	7.7	32.8	24.6	19.1	20.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.2	8.3	13.4	7.7	32.8	24.6	19.1	20.0
Queue Length 50th (m)	3.2	23.6	6.5	12.8	16.7	22.3	2.2	14.7
Queue Length 95th (m)	10.7	47.0	22.3	26.5	32.9	42.0	7.1	28.7
Internal Link Dist (m)		129.2		141.4		122.2		101.2
Turn Bay Length (m)	25.0		25.0		15.0		20.0	
Base Capacity (vph)	504	2020	315	1996	590	899	493	934
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	0.14	0.43	0.37	0.25	0.27	0.30	0.05	0.19

Intersection Summary

HCM Signalized Intersection Capacity Analysis
 1: Manse Rd & Lawrence Ave E













633 Coronation Dr
 Total (2020) - PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (vph)	63	639	141	106	422	27	144	142	97	22	121	36
Future Volume (vph)	63	639	141	106	422	27	144	142	97	22	121	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3		6.1	6.1		6.8	6.8		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	0.98	1.00		0.99	1.00		0.98	1.00		0.99	1.00	
Frt	1.00	0.97		1.00	0.99		1.00	0.94		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1748	3416		1769	3469		1743	1753		1744	1805	
Flt Permitted	0.47	1.00		0.30	1.00		0.65	1.00		0.53	1.00	
Satd. Flow (perm)	863	3416		550	3469		1188	1753		966	1805	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	70	710	157	118	469	30	160	158	108	24	134	40
RTOR Reduction (vph)	0	18	0	0	5	0	0	39	0	0	17	0
Lane Group Flow (vph)	70	849	0	118	494	0	160	227	0	24	157	0
Confl. Peds. (#/hr)	32		29	29		32	24		11	11		24
Heavy Vehicles (%)	2%	3%	2%	2%	4%	2%	3%	2%	2%	4%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	36.9	36.9		36.1	36.1		13.8	13.8		14.6	14.6	
Effective Green, g (s)	36.9	36.9		36.1	36.1		13.8	13.8		14.6	14.6	
Actuated g/C Ratio	0.59	0.59		0.57	0.57		0.22	0.22		0.23	0.23	
Clearance Time (s)	5.3	5.3		6.1	6.1		6.8	6.8		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	507	2007		316	1994		261	385		224	419	
v/s Ratio Prot		c0.25			0.14			0.13			0.09	
v/s Ratio Perm	0.08			0.21			c0.13			0.02		
v/c Ratio	0.14	0.42		0.37	0.25		0.61	0.59		0.11	0.37	
Uniform Delay, d1	5.8	7.1		7.2	6.6		22.1	22.0		19.0	20.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	0.7		3.4	0.3		4.2	2.3		0.2	0.6	
Delay (s)	6.4	7.8		10.6	6.9		26.3	24.3		19.2	20.8	
Level of Service	A	A		B	A		C	C		B	C	
Approach Delay (s)		7.7			7.6			25.0			20.6	
Approach LOS		A			A			C			C	
Intersection Summary												
HCM 2000 Control Delay			12.2				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.48									
Actuated Cycle Length (s)			62.8				Sum of lost time (s)			12.9		
Intersection Capacity Utilization			83.3%				ICU Level of Service				E	
Analysis Period (min)			15									

c Critical Lane Group

















HCM Unsignalized Intersection Capacity Analysis
2: Beechgrove Dr & Lawrence Ave E

633 Coronation Dr
Total (2020) - PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑		↔	↑↑↑			↕				↗
Traffic Volume (veh/h)	0	572	67	66	374	19	35	24	137	0	0	6
Future Volume (Veh/h)	0	572	67	66	374	19	35	24	137	0	0	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	636	74	73	416	21	39	27	152	0	0	7
Pedestrians		6						3			2	
Lane Width (m)		3.7						3.7			3.7	
Walking Speed (m/s)		1.1						1.1			1.1	
Percent Blockage		1						0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	439			713			974	1261	252	952	1288	157
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	439			713			974	1261	252	952	1288	157
tC, single (s)	4.1			4.2			7.5	6.5	7.0	7.5	6.5	7.6
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.6
p0 queue free %	100			92			79	82	80	100	100	99
cM capacity (veh/h)	1115			867			189	154	742	139	151	765
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1			
Volume Total	254	254	201	73	166	166	104	218	7			
Volume Left	0	0	0	73	0	0	0	39	0			
Volume Right	0	0	74	0	0	0	21	152	7			
cSH	1700	1700	1700	867	1700	1700	1700	372	765			
Volume to Capacity	0.15	0.15	0.12	0.08	0.10	0.10	0.06	0.59	0.01			
Queue Length 95th (m)	0.0	0.0	0.0	2.1	0.0	0.0	0.0	27.3	0.2			
Control Delay (s)	0.0	0.0	0.0	9.5	0.0	0.0	0.0	27.5	9.7			
Lane LOS				A				D	A			
Approach Delay (s)	0.0			1.4				27.5	9.7			
Approach LOS								D	A			
Intersection Summary												
Average Delay			4.7									
Intersection Capacity Utilization			44.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 3: Manse Rd & Coronation Dr

633 Coronation Dr
 Total (2020) - PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	168	134	11	1	73	63	23	21	2	26	21	98
Future Volume (vph)	168	134	11	1	73	63	23	21	2	26	21	98
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	187	149	12	1	81	70	26	23	2	29	23	109
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	348	152	51	161								
Volume Left (vph)	187	1	26	29								
Volume Right (vph)	12	70	2	109								
Hadj (s)	0.13	-0.15	0.38	-0.32								
Departure Headway (s)	4.8	4.8	5.8	4.9								
Degree Utilization, x	0.46	0.20	0.08	0.22								
Capacity (veh/h)	718	705	558	666								
Control Delay (s)	11.8	8.9	9.3	9.2								
Approach Delay (s)	11.8	8.9	9.3	9.2								
Approach LOS	B	A	A	A								
Intersection Summary												
Delay			10.5									
Level of Service			B									
Intersection Capacity Utilization			45.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 4: Beachgrove Dr/Beechgrove Dr & Coronation Dr

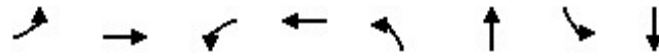
633 Coronation Dr
 Total (2020) - PM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	155	7	4	36	17	55
Future Volume (Veh/h)	155	7	4	36	17	55
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	172	8	4	40	19	61
Pedestrians						2
Lane Width (m)						3.7
Walking Speed (m/s)						1.1
Percent Blockage						0
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	100	50	80			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	100	50	80			
tC, single (s)	6.4	6.8	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.8	2.2			
p0 queue free %	81	99	100			
cM capacity (veh/h)	888	877	1518			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	180	44	80			
Volume Left	172	4	0			
Volume Right	8	0	61			
cSH	887	1518	1700			
Volume to Capacity	0.20	0.00	0.05			
Queue Length 95th (m)	5.8	0.1	0.0			
Control Delay (s)	10.1	0.7	0.0			
Lane LOS	B	A				
Approach Delay (s)	10.1	0.7	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			6.1			
Intersection Capacity Utilization			20.9%	ICU Level of Service	A	
Analysis Period (min)			15			

Queues
1: Manse Rd & Lawrence Ave E

633 Coronation Dr
Total (2020) - AM


























Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	13	314	76	1037	97	124	9	369
v/c Ratio	0.05	0.18	0.13	0.53	0.69	0.26	0.03	0.74
Control Delay	9.5	6.1	9.7	11.6	46.7	11.3	16.8	28.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.5	6.1	9.7	11.6	46.7	11.3	16.8	28.7
Queue Length 50th (m)	0.7	6.1	4.1	38.0	10.6	5.4	0.8	35.5
Queue Length 95th (m)	3.6	14.9	12.6	70.0	25.8	16.1	3.6	61.0
Internal Link Dist (m)		129.2		141.4		122.2		101.2
Turn Bay Length (m)	25.0		25.0		15.0		20.0	
Base Capacity (vph)	237	1744	568	1941	267	830	621	875
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	0.05	0.18	0.13	0.53	0.36	0.15	0.01	0.42

Intersection Summary

HCM Signalized Intersection Capacity Analysis
 1: Manse Rd & Lawrence Ave E

633 Coronation Dr
 Total (2020) - AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (vph)	12	203	79	68	916	17	87	52	59	8	203	129
Future Volume (vph)	12	203	79	68	916	17	87	52	59	8	203	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.3	5.3		6.1	6.1		6.8	6.8		6.0	6.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	0.99		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		0.98	1.00		0.98	1.00		1.00	1.00	
Frt	1.00	0.96		1.00	1.00		1.00	0.92		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1786	3043		1760	3533		1603	1668		1783	1744	
Flt Permitted	0.23	1.00		0.56	1.00		0.33	1.00		0.68	1.00	
Satd. Flow (perm)	424	3043		1040	3533		562	1668		1271	1744	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	13	226	88	76	1018	19	97	58	66	9	226	143
RTOR Reduction (vph)	0	39	0	0	1	0	0	49	0	0	34	0
Lane Group Flow (vph)	13	275	0	76	1036	0	97	75	0	9	335	0
Confl. Peds. (#/hr)	7		17	17		7	36		5	5		36
Heavy Vehicles (%)	2%	16%	7%	2%	3%	2%	12%	4%	6%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	36.9	36.9		36.1	36.1		16.7	16.7		17.5	17.5	
Effective Green, g (s)	36.9	36.9		36.1	36.1		16.7	16.7		17.5	17.5	
Actuated g/C Ratio	0.56	0.56		0.55	0.55		0.25	0.25		0.27	0.27	
Clearance Time (s)	5.3	5.3		6.1	6.1		6.8	6.8		6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	238	1709		571	1941		142	423		338	464	
v/s Ratio Prot		0.09			c0.29			0.04			c0.19	
v/s Ratio Perm	0.03			0.07			0.17			0.01		
v/c Ratio	0.05	0.16		0.13	0.53		0.68	0.18		0.03	0.72	
Uniform Delay, d1	6.5	6.9		7.2	9.4		22.1	19.1		17.8	21.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.2		0.5	1.1		12.7	0.2		0.0	5.5	
Delay (s)	6.9	7.1		7.7	10.5		34.9	19.3		17.8	27.3	
Level of Service	A	A		A	B		C	B		B	C	
Approach Delay (s)		7.1			10.3			26.1			27.1	
Approach LOS		A			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			14.6				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			65.7			Sum of lost time (s)			12.9			
Intersection Capacity Utilization			90.0%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis
2: Beechgrove Dr & Lawrence Ave E

















633 Coronation Dr
Total (2020) - AM



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑		↑	↑↑↑			↑				↑
Traffic Volume (veh/h)	0	360	56	137	751	15	37	13	75	0	0	4
Future Volume (Veh/h)	0	360	56	137	751	15	37	13	75	0	0	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	400	62	152	834	17	41	14	83	0	0	4
Pedestrians		11						5			2	
Lane Width (m)		3.7						3.7			3.7	
Walking Speed (m/s)		1.1						1.1			1.1	
Percent Blockage		1						0			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	853			467			1033	1593	169	1372	1616	300
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	853			467			1033	1593	169	1372	1616	300
tC, single (s)	4.1			4.2			7.8	6.7	7.2	7.5	6.5	7.4
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.6	4.1	3.4	3.5	4.0	3.5
p0 queue free %	100			86			72	84	90	100	100	99
cM capacity (veh/h)	780			1078			148	85	805	74	89	625
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1	SB 1			
Volume Total	160	160	142	152	334	334	184	138	4			
Volume Left	0	0	0	152	0	0	0	41	0			
Volume Right	0	0	62	0	0	0	17	83	4			
cSH	1700	1700	1700	1078	1700	1700	1700	254	625			
Volume to Capacity	0.09	0.09	0.08	0.14	0.20	0.20	0.11	0.54	0.01			
Queue Length 95th (m)	0.0	0.0	0.0	3.7	0.0	0.0	0.0	22.5	0.1			
Control Delay (s)	0.0	0.0	0.0	8.9	0.0	0.0	0.0	34.9	10.8			
Lane LOS				A				D	B			
Approach Delay (s)	0.0			1.3				34.9	10.8			
Approach LOS								D	B			
Intersection Summary												
Average Delay			3.9									
Intersection Capacity Utilization			40.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 3: Manse Rd & Coronation Dr

633 Coronation Dr
 Total (2020) - AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	49	92	13	1	122	17	25	10	0	58	31	241
Future Volume (vph)	49	92	13	1	122	17	25	10	0	58	31	241
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	54	102	14	1	136	19	28	11	0	64	34	268
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	170	156	39	366								
Volume Left (vph)	54	1	28	64								
Volume Right (vph)	14	19	0	268								
Hadj (s)	0.11	0.05	0.57	-0.36								
Departure Headway (s)	5.2	5.2	5.8	4.5								
Degree Utilization, x	0.25	0.22	0.06	0.45								
Capacity (veh/h)	634	636	558	761								
Control Delay (s)	9.9	9.7	9.2	11.1								
Approach Delay (s)	9.9	9.7	9.2	11.1								
Approach LOS	A	A	A	B								
Intersection Summary												
Delay			10.4									
Level of Service			B									
Intersection Capacity Utilization			45.8%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 4: Beechgrove Dr & Coronation Dr

633 Coronation Dr
 Total (2020) - AM



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	37	10	14	17	54	138
Future Volume (Veh/h)	37	10	14	17	54	138
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	41	11	16	19	60	153
Pedestrians	7					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.1					
Percent Blockage	1					
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	194	144	220			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	194	144	220			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	99	99			
cM capacity (veh/h)	779	893	1323			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	52	35	213			
Volume Left	41	16	0			
Volume Right	11	0	153			
cSH	801	1323	1700			
Volume to Capacity	0.06	0.01	0.13			
Queue Length 95th (m)	1.6	0.3	0.0			
Control Delay (s)	9.8	3.6	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.8	3.6	0.0			
Approach LOS	A					
Intersection Summary						
Average Delay			2.1			
Intersection Capacity Utilization			23.4%	ICU Level of Service	A	
Analysis Period (min)			15			

Appendix F – Development Heavy Truck Photographs



