Traffic Impact Study

Residential Development
1683 Moore Drive &
1490 County Road 28, Fraserville
Township of Cavan Monaghan
County of Peterborough

D.M. Wills Project Number 85152

D.M. Wills Associates Limited
Partners in Engineering, Planning and Environmental Services
Peterborough

September 2022

Summary of Revisions

Revision No.	Revision Title	Date of Release	Summary of Revisions
1	Draft Report	November 23, 2021	Draft Report Submitted
2	Final Report	January 24, 2022	Modifications according to the MTO's comments made in the pre-consultation meeting and the comments received from the County of Peterborough
3	Final Report	May 18, 2022	Final Report Submitted
4	Final Report	July 25, 2022	Site plan update
5	Final Report	August 16, 2022	Final Report Submitted
6	Final Report	September 13, 2022	Site plan update

This report has been formatted considering the requirements of the Accessibility for Ontarians with Disabilities Act.

Executive Summary

D.M. Wills Associates Limited (Wills) has been retained to investigate the impact of a proposed redevelopment of Kawartha Downs and a proposed residential subdivision to the north of it (the development) on the traffic operation in the area. The development is located at 1382 County Road 28, 1490 County Road 28, and 1683 Moore Drive, Fraserville, Ontario. The lands are to the south side of Moore Drive (South of Highway 115) and on the west side of Peterborough County Road 28 (CR 28).

As proposed in the draft conceptual plan, the proposed development includes two components; residential and recreational developments. The residential development is proposed to include 328 single detached dwellings, 66 semi-detached dwellings, and 123 townhouses. Most of these dwellings will have an access to Moore Drive, and only 52 single detached dwellings will have a direct access to CR 28. For the recreational development, the existing racetrack and horse barns will remain the same, but the oval infield will include an outdoor amphitheater and four soccer fields. The casino will remain the same with the addition of a multi-use event center, hotel, and a tractor pull. The recreational development has two existing entrances/exits on CR 28, and the development does not have any access to Syer Line. The study area includes CR 28 intersections with Moore Drive, CR 11, Syer Line, and Whitfield Road. Also, the study area includes two entrances of the recreational component on CR 28 and an entrance to the 52 dwelling units residential component on CR 28.

A traffic operation analysis has been conducted using Synchro 9.0 to investigate the impact of the traffic generated from the proposed development on the study area. This analysis is split into two main parts, namely, the background traffic conditions and the traffic condition with the consideration of the development impact. The analysis has covered the AM and PM peaks, as well as the current (i.e. 2021) and horizon years (i.e. 2026 and 2031) scenarios. Also, a scenario for a sold-out event in the outdoor amphitheater was investigated. The study also investigated the need for auxiliary lanes and traffic signals at the intersections and entrances within the study area.

The results of this study can be summarized in the following points:

- Regardless of the development impact
    - At CR 28 intersection with Moore Drive, a left turn lane for the northbound traffic and a right turn taper for the southbound traffic are needed.
    - An extension of the existing left turn lane at Whitfield Road is needed based on the existing traffic at this intersection and given a proposed development on Whitfield Road.
- With the consideration of the development impact
    - At the intersection of CR 28 and Moore Drive, a full-width right turn lane for the southbound traffic is needed in addition to a left turn lane for the northbound traffic.
    - At the intersection of CR 28 and Moore Drive, it is recommended to consider the installation of a traffic signal at this intersection; however, a

traffic signal is not fully warranted. The reason behind recommending a traffic signal is the substantially low LOS and high v/c ratio on Moore Drive after the full operation of the development. Although CR 11 is in a close proximity to CR 28, CR 11 will not be impacted by the installation of traffic signal at the intersection of CR 28 and Moore Drive. This is because the traffic volumes on CR 11 are significantly low (9 to 12 veh/hr during the AM peak and 5 to 7 veh/hr during the PM peak hour for current and future scenarios) based on the counts provided by the County of Peterborough.

- The entrance of the residential development on CR 28 will not need any auxiliary lanes. Based on the assumptions documented in this report, it is anticipated that 14 vehicles only will turn left from CR 28 to the entrance during the PM peak. This left-turning volume is relatively low and with the signalization of Moore Drive intersection, this relatively low volume is not anticipated to interrupt the traffic operation on CR 28 even after the addition of a left turn lane for Moore Drive.
- Based on discussions with the client, we understand that there is an environmental constraint that will prevent connecting the residential component (52 dwelling units) on CR 28 to the rest of the residential subdivision that will access Moore Drive. The proposed location of the residential entrance on CR 28 meets the Peterborough County by-law no. 2012-26 understanding that the only access available to this portion of land is from CR 28. It is anticipated the entrance will be designed according to this by-law and constructed according to Peterborough County relevant standards.
- At the secondary entrance of the recreational development, a full-width right turn lane for the southbound traffic and a left turn lane for the left turn traffic are needed.
- At the main entrance of the recreational development, a traffic signal is warranted.
- Peterborough County may consider widening CR 28 as part of their long-term plan (i.e. 30 years, which is beyond the study horizon of this report). If this widening is considered in the future, it is not anticipated to have a significant impact on the results of this report. Nevertheless, the County should review the travel pattern and the traffic conditions on CR 28 and the surrounding area by that time.
- A signalization or ramp metering at the south off-ramp merging into CR 28 from Highway 115 is not warranted since CR 28 is not expected to reach 95% capacity according to MTO ITS903 – Freeway Ramp Metering.

This study and associated recommendations were completed based on what would be constituted as a 'normal' operational condition in accordance with typical practices. It is understood that due to the nature of the redeveloped venue, large events will be hosted, on an infrequent basis, which would represent an atypical condition. Typically, these events are not usually used as the basis of design, since the remedial measures to accommodate a massive influx/outflux of vehicles in a short time would be

uncharacteristic and excessive for a normal condition. This is especially typical for events at locations such as large stadiums and sporting/event venues. In such cases, event staff typically develop an event-specific traffic control plan and provide adequate staffing and traffic control personnel to direct traffic (both pedestrian and vehicular) accordingly and in as safe and organized manner as possible within the site to minimize disruption to main street traffic as much as possible. We understand that this practice will be employed by venue staff and will include the use of multi-lane stacking on the access road within the Kawartha Downs property and event traffic control staff during these events.

Table of Contents

List of Tables

Appendices

1.0 Introduction and Background

D.M. Wills Associates Limited (Wills) was retained by RIC (Moore Drive) Inc. and RIC (Highway 28) Inc. to undertake a Traffic Impact Study (TIS) to assess the impact of the Kawartha Downs Redevelopment located at 1382 County Road 28, 1490 County Road 28, and 1683 Moore Drive, Fraserville, Ontario on the traffic operation in the area.

The purpose of this TIS Report is to assess the impact of the proposed developments on traffic operations of the adjacent roads for both current and future conditions. Also, this study examines the need for auxiliary lanes at the entrances of the developments on Peterborough County Road 28 (CR 28) and at the intersection of CR 28 and Moore Drive. Moreover, traffic signal warrant analyses are conducted for each entrance and for the intersection of CR 28 and Moore Drive. This study will assess the Level of Service (LOS) at the intersections of CR 28 with Moore Drive and Syer Line for both current and future conditions. Also, this study will assess the impact of the developments on the intersections of CR 28 and CR 11, and CR 28 and Whitfield Road. Therefore, the study area is defined here as the entrances of the developments on CR 28 and the intersections of CR 28 with Moore Drive, CR 11, Syer Line, and Whitfield Road.

Parts of the subject lands where the developments are planned are currently vacant, while the other parts are currently developed with recreational uses including a casino, racetracks, horse barns, and event staging area. The proposed developments are located to the west of CR 28 and Moore Drive is located on the north boundary of the land, while Syer Line is located on the south boundary. The lands surrounding the proposed developments are a mix of farmlands with rural-style residential homes and undeveloped lands. An aerial photo sketching an approximate location plan of the lands is included in Appendix A.

The proposed developments include two components; residential and recreational developments. The residential development is proposed to include 328 single detached dwellings, 66 semidetached dwellings, and 123 townhouses. Most of these dwellings will have an access to Moore Drive and only 52 single detached dwellings will have a direct access to CR 28 as shown in Appendix B. For the recreational development, the existing racetrack and horse barns will remain the same but the oval infield will include an outdoor amphitheater and four soccer fields. The casino will remain the same with the addition of a multi-use event center, hotel, and a tractor pull as shown in Appendix B. The recreational development has two existing entrances/exits on CR 28 and the development does not have any access to Syer Line.

2.0 Background Traffic Analysis

2.1 Roadway Existing Conditions

Within the study area, CR 28 has a two-way two-lane cross-section. Both sides of CR 28 have double solid yellow line, solid white markings, unpaved shoulders, and ditches. At

the intersection of CR 28 and the main entrance/exit of the recreational development, the exit direction is controlled with a stop sign. There is a right turn lane for the southbound direction and a left turn lane for the northbound direction at the main entrance of the recreational development. The speed limit on CR 28 within the study area is 80 km/hr.

Moore Drive within the study area has a two-way two-lane rural cross-section with unpaved shoulders and ditches and no pavement marking. Moore Drive intersects CR 28 in a T-intersection with a stop sign on Moore Drive.

2.2 Existing and Future Background Traffic Conditions

This study uses the traffic counts that were collected on July 7, 2021, at the intersections of CR 28 with Moore Drive and Syer Line and were considered to represent current site conditions on a typical weekday. The traffic counts conducted at this intersection are included in Appendix C. Based on the traffic counts at the intersection of CR 28 and Moore Drive, the AM peak hour is identified between 7:00 am and 8:00 am, while the PM peak hour occurs between 3:30 pm and 4:30 pm. On the other hand, the AM and PM peak hours at the intersection of CR 28 and Syer Line occur between 7:30 and 8:30 am, and 4:30 pm and 5:30 pm, respectively. Since there are differences between the peak hours and to ensure investigating the peak hours at both intersections, each intersection will be modelled separately. However, the trips generated from the developments will be distributed on both intersections during the above mentioned peak periods. Also, when the traffic counts were collected on July 7, 2021, the horse racetrack and casino were not open to public yet due to the provincial COVID19 restrictions.

Moreover, the traffic counts at the intersections between CR 28 and CR 11 (Moncrief Line), and CR 28 and Whitfield Road are acquired from the County and from a recent project that was completed by our team. Due to the different sources of data and data collection times, each of these two intersections will be analyzed separately. The traffic counts at the intersection of CR 28 and CR 11 were collected in November 6, 2018 and the AM and PM peak hours were between 7:30 am and 8:30 am, and 4:15 pm and 5:15 pm, respectively. The traffic counts at the intersection of CR 28 and Whitfield Road were collected on August 18, 2020 and the AM and PM peak hours were between 7:45 am and 8:45 am, and 2:00 pm and 3:00 pm, respectively. Also, it is known to our team that there will be a development on Whitfield Road that will impact the intersection of CR 28 and Whitfield Road. Therefore, the impact of this development is added to the existing condition and the total background traffic is presented in Table 4.

To obtain traffic volumes for the horizon years 2026 and 2031, the future traffic counts were estimated using an annual growth rate of 2.0%. The traffic volumes in the current year and the horizon years (i.e. 2026 and 2031) are summarized in Table 1, Table 2, Table 3, and Table 4.

Table 1 - Traffic Volumes at CR 28 & Moore Drive Intersection

	EBL	EBR	NBL	NBT	SBT	SBR
AM Peak Hour						
2021	17	20	14	418	343	9
2026	19	22	15	462	379	10
2031	21	24	17	510	418	11
PM Peak Hour						
2021	17	22	12	323	440	20
2026	19	24	13	357	486	22
2031	21	27	15	394	536	24

Table 2 - Traffic Volumes at CR 28 & Syer Line Intersection

	EBL	EBR	NBL	NBT	SBT	SBR
AM Peak Hour						
2021	9	9	5	379	303	4
2026	10	10	6	418	335	4
2031	11	11	6	462	369	5
PM Peak Hour						
2021	9	6	8	422	467	9
2026	10	7	9	466	516	10
2031	11	7	10	514	569	11

Table 3 - Traffic Volumes at CR 28 & CR 11 Intersection

	EBL	EBR	NBL	NBT	SBT	SBR
AM Peak Hour						
2018	2	7	578	2	5	334
2021	2	7	613	2	5	354
2026	2	8	677	2	6	391
2031	3	9	748	3	6	432
PM Peak Hour						
2018	3	2	465	0	5	549
2021	3	2	493	0	5	583
2026	4	2	545	0	6	643
2031	4	3	602	0	6	710

Table 4 - Traffic Volumes at CR 28 & Whitfield Intersection

	EBL	EBR	NBL	NBT	SBT	SBR
AM Peak Hour						
2020	11	36	372	2	21	272
2021	11	37	379	2	21	277
2026	12	41	419	2	24	306
2031	14	45	463	2	26	338
PM Peak Hour						
2020	5	37	334	4	38	407
2021	5	38	341	4	39	415
2026	6	42	376	5	43	458
2031	6	46	415	5	47	506

It is worth noting that no pedestrian movements were observed during the peak hours at any of these intersections except during the AM peak at CR 28 and Syer Line when only 2 pedestrians were observed. Accordingly, and based on the nature of the development and the study area, this study assumes that pedestrians do not have any adverse effect on traffic operations in the study area.

2.3 Existing and Future Background Traffic Operation

Synchro 9 software was used to review the existing and future traffic operation at the CR 28 and Moore Drive and CR 28 and Syer Line intersections without the development. Traffic operations were investigated for the existing conditions of 2021, and the horizon years 2026 and 2031. The Level of Service (LOS) and volume to capacity (v/c) ratio results of the existing and future scenarios without the developments impact (i.e. background traffic volumes) are shown in Table 5, Table 6, Table 7, and Table 8. More details about the LOS definition and Synchro models results for these scenarios are presented in Appendix D and Appendix E, respectively.

As shown in the tables, most of the approaches maintain the same LOSs over the study period. The LOSs during the AM peak hour in 2031 drop slightly from "C" to "D" for Moore Drive and from "B" to "C" for Syer Line. Despite these drops in the LOSs, the v/c ratios remain significantly low, which implies a smooth traffic operation on both side roads (i.e. Moore Drive and Syer Line). Similarly, the LOSs drop slightly from "B" to "C" for CR 11 during the AM peak in 2026 and the LOSs remain at "C" in 2031. Moreover, the LOSs are slightly decreased from "B" to "C" during both peak hours in 2031 for the intersection of CR 28 and Whitfield Road. Again, the v/c ratios remain significantly low, which implies a smooth traffic operation on both side roads (i.e. CR 11 and Whitfield Road)

Table 5 - Traffic Operation Measures at CR 28 and Moore Drive Intersection based on the Total Background Traffic

	EB	NBL	SB
AM Peak Hour			
2021	0.231 (C)	0.02 (A)	-
2026	0.296 (C)	0.022 (A)	-
2031	0.384 (D)	0.027 (A)	-
PM Peak Hour			
2021	0.136 (C)	0.014 (A)	-
2026	0.169 (C)	0.016 (A)	-
2031	0.216 (C)	0.02 (A)	-

* LOS (v/c ratio)

Table 6 - Traffic Operation Measures at CR 28 and Syer Line Intersection based on the Total Background Traffic

	EB	NBL	SB
AM Peak Hour			
2021	0.07 (B)	0.005 (A)	-
2026	0.085 (B)	0.006 (A)	-
2031	0.104 (C)	0.006 (A)	-
PM Peak Hour			
2021	0.073 (C)	0.009 (A)	-
2026	0.094 (C)	0.01 (A)	-
2031	0.117 (C)	0.012 (A)	-

* LOS (v/c ratio)

Table 7 - Traffic Operation Measures at CR 28 and CR 11 Intersection based on the Total Background Traffic

	WB	NB	SBL
AM Peak Hour			
2021	0.025 (B)	-	0.006 (A)
2026	0.031 (C)	-	0.008 (A)
2031	0.045 (C)	-	0.008 (A)
PM Peak Hour			
2021	0.02 (C)	-	0.005 (A)
2026	0.029 (C)	-	0.007 (A)
2031	0.037 (C)	-	0.007 (A)

* LOS (v/c ratio)

Table 8 - Traffic Operation Measures at CR 28 and Whitfield Road Intersection based on the Total Background Traffic

	WB	NB	SBL
AM Peak Hour			
2021	0.134 (B)	-	0.026 (A)
2026	0.156 (B)	-	0.03 (A)
2031	0.186 (C)	-	0.033 (A)
PM Peak Hour			
2021	0.129 (B)	-	0.044 (A)
2026	0.153 (B)	-	0.05 (A)
2031	0.176 (C)	-	0.056 (A)

* LOS (v/c ratio)

3.0 Auxiliary Lanes Warrant Analyses based on the Background Traffic Condition

The warrants for auxiliary lanes were examined for the existing condition on CR 28 at Moore Drive, Syer Line, CR 11 (Moncrief Line), and Whitfield Road in accordance with

Appendix 9A of MTO's *Design Supplement for the 2017 Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads*[1].

The need for a left-turn lane at an unsignalized intersection (i.e. at the intersection of CR 28 and Syer Line) as established by the Design Supplement, Chapter 9A is based on the advancing traffic volume (V_A), the opposing traffic volume (V_O), the left-turning traffic volume (V_L), and the percentage of left-turning traffic in the advancing volume (LT%). As shown in Table 9 for CR 28 intersection with Moore Drive, although the left turning traffic volume is relatively low, it triggers the need for a left turn lane on CR 28 for the northbound direction as shown in Appendix F. It is worth mentioning that the warrant is applied only for the PM peak hour since the percentage of the left turning volume is close to 5%, unlike the AM peak hour where the percentage is around 3%.

Table 9 – Left Turning Volume Calculations for CR 28 and Moore Drive Intersection

	V_L	V_A	LT%	V_O
AM Peak				
2021	14	432	3%	352
2026	15	477	3%	389
2031	17	527	3%	429
PM Peak				
2021	12	335	4%	460
2026	13	370	4%	508
2031	15	408	4%	561

For the right-turn lane warrant analysis at the entrance of the development, the TAC Manual specifies that right-turn lanes should be considered "*when the volume of decelerating or accelerating vehicles compared with through traffic volumes causes undue hazard.*" According to the County of Peterborough guidelines, a turn lane or taper may be required based on the Virginia Department of Transportation (VDOT) warrant criteria. The right turning traffic volumes anticipated for the southbound direction are ranging from 9 during the AM peak hour in 2021 to 24 veh/hr during the PM peak in 2031 as shown in Table 1. Based on PM peak hour volumes, a right turn taper is warranted as shown in Appendix F.

For Syer Line and CR 11, Table 12 and Table 11 summarize the left-turn lane warrant calculations. As shown in the tables, the percentages of the left turning volumes to the advanced volumes are significantly low and far from 5%, and hence, a left turn lane is not warranted at the intersection of CR 28 and Syer Line nor at the intersection of CR 28 and CR 11.

For the right turn lane and according to the County of Peterborough guidelines, a right turn taper is not warranted since the right turning volumes on the southbound and

[1] Transportation Association of Canada (TAC). Geometric Design Guide for Canadian Roads: Design Controls, Classification and Consistency. Transportation Association of Canada, 2017.

northbound directions are less than 20 veh/hour at Syer Line and CR 11, respectively, for the current and future scenarios.

Table 10 – Left Turning Volume Calculations for CR 28 and Syer Line Intersection

	V_L	V_A	LT%	V_O
AM Peak				
2021	5	384	1%	307
2026	6	424	1%	339
2031	6	468	1%	374
PM Peak				
2021	8	430	2%	476
2026	9	475	2%	526
2031	10	524	2%	580

Table 11 – Left Turning Volume Calculations for CR 28 and CR 11 Intersection

	V_L	V_A	LT%	V_O
AM Peak				
2021	5	360	1%	616
2026	6	397	1%	680
2031	6	439	1%	750
PM Peak				
2021	5	588	1%	493
2026	6	649	1%	545
2031	6	717	1%	602

For Whitfield Road and as shown in Table 12, a left-turn lane is warranted at this intersection for the southbound left-turn movement as shown in Appendix F.

The intersection of CR 28 and Whitfield Road has a full-width right turn lane for the northbound direction. Therefore, no right turn lane warrant analysis is required.

Table 12 – Left Turning Volume Calculations for CR 28 and Whitfield Road Intersection

	V_L	V_A	LT%	V_O
AM Peak				
2021	27	305	9%	390
2026	30	336	9%	430
2031	32	370	9%	474
PM Peak				
2021	48	463	10%	353
2026	52	510	10%	389
2031	56	562	10%	428

4.0 Traffic Operation Conditions with the Development Consideration

4.1 Trip Generation

4.1.1 Trip Generation for the Residential Component

Estimation of trips generated by the proposed development was derived from the *Trip Generation Manual, 8th Edition*[2], published by the Institute of Transportation Engineers (ITE). The ITE codes of the land uses, which describe the dwelling unit types, and the corresponding trip generation rates are shown in Table 13. Also, the table shows the average trip generation rates for each housing type for both the AM and the PM peaks and the percentages of entering and exiting.

The residential component of this development has three types of dwelling units; namely, single detached, semi-detached dwelling units, and townhouses. Since the ITE Manual does not include a land use for the semi-detached units, it is assumed that both the single detached and the semi-detached will have the same trip generation rates.

Table 13 - Trip Generation Rates during AM and PM Peak Hours for the Residential Component

Land Use	ITE Code	AM Peak			PM Peak		
		Avg. Rate	Entering	Exiting	Avg. Rate	Entering	Exiting
Single/semi-detached dwelling unit	210	0.75	25%	75%	1.01	63%	37%
Townhouses	230	0.44	17%	83%	0.52	67%	33%

The average trip generation rates provided by the ITE Manual for the peak hours of the adjacent street were used. The results summary of the new trips generated (rounded) is presented in Table 14. The trips were estimated based on the proposed number of dwelling units that are shown on the site plan in Appendix B. According to this draft plan, the residential component is split into two parts. The first part has a direct access to Moore Drive and it consists of 276 single detached, 66 semi detached dwelling units, and 123 townhouses. The other part has a direct access to CR 28 and it consists of 52 single detached dwelling units as shown in Table 14.

Table 14 - The Estimated Entering and Exiting Trips during AM and PM Peak Hours for the Residential Component

Land Use	Number of Units	AM Peak			PM Peak		
		Avg. Rate	Entering	Exiting	Avg. Rate	Entering	Exiting
First part of residential component with direct access to Moore Drive							
Single detached dwelling unit	276	207	52	155	279	176	103
Semi-detached dwelling unit	66	50	12	37	67	42	25
Townhouses	123	54	9	45	64	43	21

[2] Trip Generation Manual, Vol. 1, 2, and 3, 8th ed. ITE, Washington, D.C., 2008.

Total		311	73	237	409	260	149
Second part of residential component with direct access to CR 28							
Single detached dwelling unit	52	39	10	29	53	33	19
Total		39	10	29	53	33	19

4.1.2 Trip Generation for the Recreational Component during PM Peak Hours

Again, the ITE Trip Generation Manual is used to estimate the trips generated by the proposed development. The ITE codes of the land uses that best describe the proposed and the existing uses within the recreational component of the development and the corresponding trip generation rates are shown in Table 15. Also, the table shows the average trip generation rates for each land use for both the AM and the PM peaks and the percentages of entering and exiting. As mentioned before, since the Casino and the racetrack were closed to public during the traffic count, the trip generation for these activities will be considered in the calculations as shown in the table.

Table 15 - Trip Generation Rates during AM and PM Peak Hours
for the Recreational Component

Land Use	ITE Code	AM Peak			PM Peak		
		Avg. Rate	Entering	Exiting	Avg. Rate	Entering	Exiting
Hotel	310	0.52	55%	45%	0.61	58%	42%
Existing Casino	473	0	0%	0%	13.43	56%	44%
Multi-use Event Centre	435	0	0%	0%	3.58	55%	45%
Soccer Field	488	1.4	50%	50%	20.67	69%	31%
Existing Horse Racetrack	452	0.01	91%	9%	0.22	91%	9%
Outdoor Amphitheater	441	0	0	0	0.02	50%	50%

The peak hour of the adjacent street for these uses are used except for the Hotel and Horse Racetrack where the peak hour rates of the generator are used since it is assumed that the peak hour of the generators will coincide with the peak hour of the adjacent street. As noticed from the table, most of the land uses attractions are during the PM peak hour except the Hotel and the soccer field. However, the soccer filed trip generation rate during the AM peak will significantly low. For the multi-use event centre, the closest land use in the ITE Manual is selected to be multipurpose recreational facility because the event centre will include indoor field, public spaces, WCs, etc. as indicated in the site plan in Appendix B.

Also, based on discussions with the client, these land uses will not all operate concurrently. For example, the horse racetrack will not operate simultaneously when the outdoor amphitheater or the soccer field are used. Therefore, a worst-case scenario is assumed for the analysis in this section. The scenario assumes that the hotel, horse racetrack, and the casino are going to operate at the same time and the PM peak hour of these uses will be the same as the peak hour of the adjacent street. Since the outdoor amphitheater is the biggest trip attraction in this development and the peak hour of the amphitheater will not coincide with the PM peak hour of the adjacent street, a closer look at the amphitheater trip generation will be discussed later in this report.

Table 16 - The Estimated Entering and Exiting Trips
during AM and PM Peak Hours for the Recreational Component

Land Use	Size	AM Peak			PM Peak		
		Avg. Rate	Entering	Exiting	Avg. Rate	Entering	Exiting
First part of residential component with direct access to Moore Drive							
Hotel (rooms)	115*	60	33	27	70	41	29
Existing Casino (GFA – ft²)	50000	0	0	0	672	376	295
Horse Racetrack (spectators)	2000	20	18	2	440	400	40
Total		124	75	49	1014	647	367

*Assumed number of hotel rooms since the exact number of hotel rooms was not available when this report was produced.

Table 16 shows the estimated trips generated by the three uses as part of the worst-case scenario for the peak hour. The generated trips will have a direct access to CR 28 through two entrances; one main entrance and another secondary entrance and as discussed with the client, there is no access from the development to Syer Line.

Also, it is assumed that there is no pass-by trips for all the developments since the characteristics of the developments indicate that they are final destinations. Due to the lack of information regarding the internal trips in such a development and to assess the worst-case scenario, it is assumed that there is no internal trips within the development itself.

4.1.3 Trip Generation for the Outdoor Amphitheatre

According to the details in the proposed site plan, it is anticipated that the amphitheatre will have 3,880 raked seats in addition to 5,000 lawn seating capacity. The total maximum capacity for a sold-out event will be 8,880 attendees.

The ITE Manual does not have any similar land use that could be adopted here for the proposed outdoor amphitheatre. Therefore, three similar studies carried out in Florida, Tennessee and New York, US[3] for theaters and amphitheatre are explored to estimate the trip generation for this use. The assumed vehicle occupancy rate in these studies ranges from 1.5 to 3.1 passenger/vehicle. Based on the characteristics of the area around Kawartha Downs and being in suburban context, it is assumed that the vehicle occupancy will be 2.8 passenger/vehicle as an intermediate value between the assumptions in previous studies. Also, these studies assume a temporal arrival distribution to the event with a maximum arrival percentage of 60-70% of the total anticipated trips. For this study, it is assumed an average of 65% of the total anticipated trips will arrive during the maximum arrival hour just before the event starts. Assuming the event will start at 8 pm, 65% of the trips will arrive between 7 pm and 8 pm. The rest of the trips will arrive during the hour when the event starts (10% will arrive between 8pm and 9 pm) and 25% will arrive between 6 pm and 7 pm. Since this recreational component has two

[3] - Traffic Impact Statement. Gulfshore Playhouse Planned Development – Rezone.
- Traffic Impact Study. Graystone Quarry Amphitheatre, Thompson's Station, Tennessee.
- Traffic Impact Study. Lakeview Amphitheatre, Onondaga County, NewYork.

entrances, it is assumed that 70% of the traffic will use the main entrance while the remaining 30% will use the secondary entrance. Finally, it is assumed that 95% of the trips will be coming to the amphitheatre using automobile, unlike other studies which assume high percentages for buses and other modes of travel to be used for transportation to the site. Also, it is assumed that the hotel will not generate considerable trips during a sold-out event being held in the amphitheatre when compared to the trip generated by the amphitheater. Moreover, there is no reduction applied to the trips generated by the amphitheatre due to the internal trips between the amphitheater and the hotel.

Based on this discussion, a total of 1,958 vehicle/hour is anticipated to arrive to the site during the peak arrival hour. This is calculated as follow 8,880 (total attendees)*0.95 (automobile usage)*0.65 (maximum arrival percentage)/2.8 (vehicle occupancy rate). As discussed, 1,371 vehicle/hour (70% of the traffic) will use the main entrance (for entering and exiting), while the remaining 588 vehicle/hour (30% of the traffic) will use the secondary entrance (for entering and exiting).

4.2 Trip Distribution

4.2.1 Trip Distribution for the Residential Component during PM Peak Hours

Based on the existing turning movements ratios, the trips generated from the development are distributed as shown in Table 17. For the residential component, the trip distribution ratios are estimated based on the actual traffic counts at CR 28 and Moore Drive.

Table 17 - Trip Distribution Ratios on CR 28 for the Residential Component

CR 28 at Moore Drive	AM		PM	
	Volume	Ratio	Volume	Ratio
Northbound through traffic	418	0.549	323	0.423
Southbound through traffic	343	0.451	440	0.577
CR 28 at Residential Entrance	AM		PM	
	Volume	Ratio	Volume	Ratio
Northbound through traffic	432	0.543	335	0.420
Southbound through traffic	363	0.457	462	0.580

Based on the ratios in Table 17, the number of trips generated by the development shown in Table 14, the trip distribution on the turning movements of CR 28 and Moore Drive intersection due to the residential component is presented in Table 18.

Table 18 - The Turning Movement Volumes Added to the Intersection of CR 28 and Moore Drive

Peak Hour	EBL	EBR	NBL	NBT	SBT	SBR
AM	130	107	40	0	0	33
PM	63	86	110	0	0	150

Similarly, the turning movements at the entrance of the residential part that has direct access to CR 28 are shown in Table 19.

Table 19 - The Turning Movement Volumes Added
to CR 28 at the Entrance of the Residential Component

Peak Hour	EBL	EBR	NBL	NBT	SBT	SBR
AM	16	13	5	0	0	4
PM	8	11	14	0	0	19

4.2.2 Trip Distribution for the Recreational Component during PM Peak Hours

Based on the existing turning movements ratios, the trips generated from the development are distributed as shown in Table 20. For the recreational component, the trip distribution ratios are estimated based on the actual traffic counts at CR 28 and Syer Line intersection.

Table 20 - Trip Distribution Ratios on CR 28 for the Recreational Component

CR 28 at Syer Line	AM		PM	
	Volume	Ratio	Volume	Ratio
Southbound Left Traffic	388	0.558	323	0.423
Southbound Right Traffic	307	0.442	440	0.577

Since the recreational development has two entrances, it is assumed for this scenario that a portion (50%) of the trips generated by the horse racetrack will use the secondary entrance. However, the trips generated from the casino and the hotel will use the main entrance only. Accordingly and based on the ratios in Table 20, the number of trips generated by the recreational development shown in Table 16 will be distributed on the turning movements at the main and secondary entrance of the recreational development is presented in Table 21 and Table 22.

Table 21 - The Turning Movement Volumes Added
to CR 28 at the Main Entrance of the Recreational Component

Peak Hour	EBL	EBR	NBL	NBT	SBT	SBR
AM	16	13	29	0	0	23
PM	146	199	261	0	0	356

Table 22 - The Turning Movement Volumes Added
to CR 28 at the Secondary Entrance of the Recreational Component

Peak Hour	EBL	EBR	NBL	NBT	SBT	SBR
AM	1	1	10	0	0	8
PM	8	11	85	0	0	115

It is worth mentioning that it is assumed that the trip generated from both development components (i.e. residential and recreational) will not increase over the horizon years since there is no expansion anticipated within the development.

Also, due to the low volume that is using CR 11 as in the traffic counts provided by the County, it is assumed that no trips generated from the development will be distributed on CR 11 (i.e. either from or to CR 11). Accordingly, the traffic movements added to the intersection of CR 28 and CR 11 are shown in Table 23.

Table 23 - The Turning Movement Volumes Added to the intersection of CR 28 and CR 11

Peak Hour	WBL	WBR	NBT	NBR	SBL	SBT
AM	0	0	73	0	0	142
PM	0	0	273	0	0	577

The total generated trips that will pass through the segment between Syer Line and Whitfield Road is summarized in Table 24. All the generated trips will be then distributed on the turning movements at the intersection of CR 28 and Whitfield Road according to the ratios shown in Table 25. The traffic movements added to this intersection due to the developments are summarized in Table 26.

Table 24 - Total Trips Generated by the Developments between Syer Line and Whitfield Road

Peak Hour	WBL	WBR	NBT	NBR	SBL	SBT
AM	0	0	85	0	0	134
PM	0	0	470	0	0	308

Table 25 - Trip Distribution Ratios at the Intersection of CR 28 and Whitfield Road

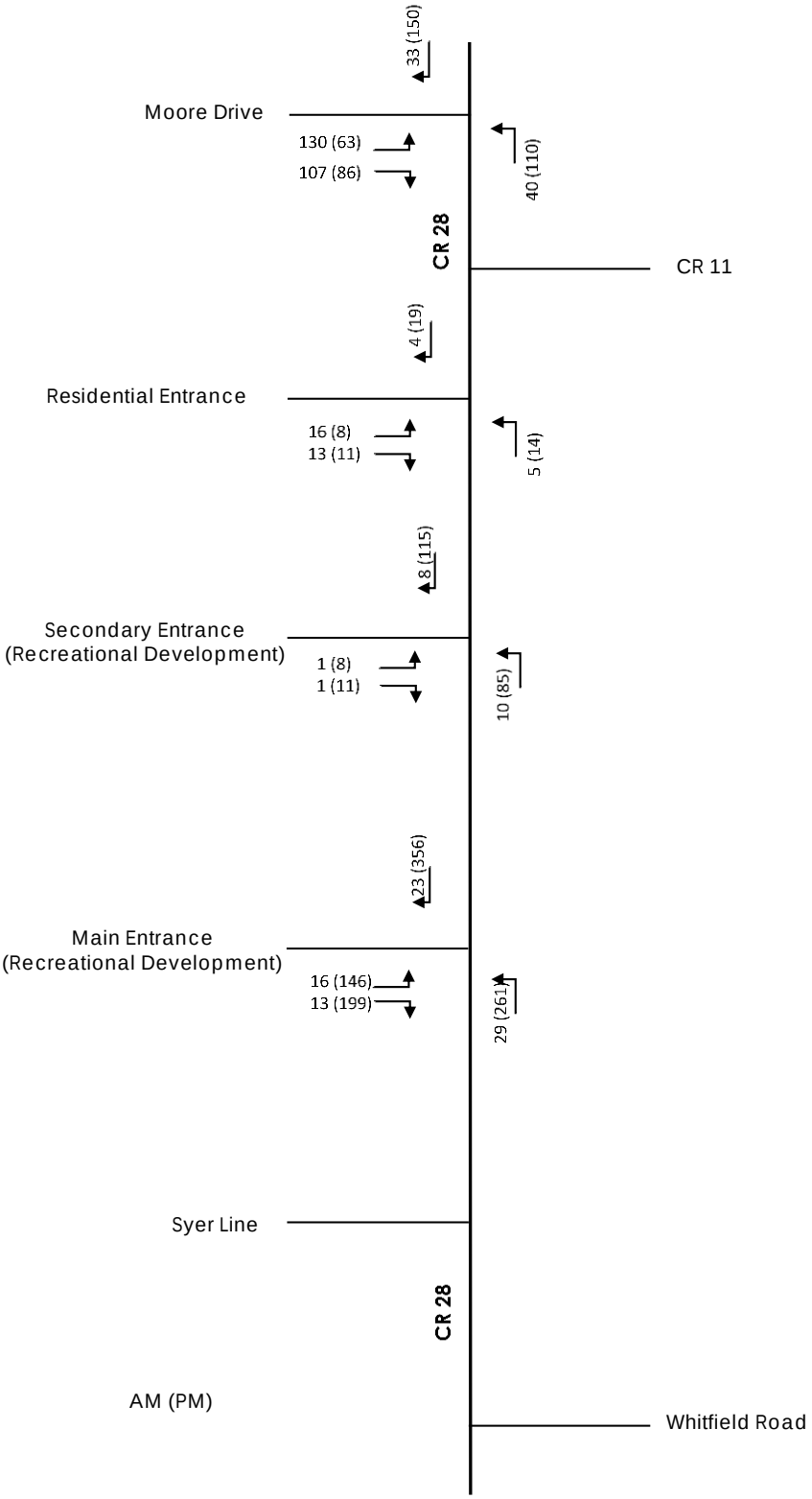
CR 28 at Moore Drive	AM		PM	
	Volume	Ratio	Volume	Ratio
Northbound through traffic	379	0.892	341	0.882
Westbound right traffic	46	0.108	46	0.118
CR 28 at Residential Entrance	AM		PM	
	Volume	Ratio	Volume	Ratio
Southbound through traffic	277	0.910	415	0.897
Southbound left traffic	27	0.090	48	0.103

Table 26 - The Turning Movement Volumes Added to the intersection of CR 28 and Whitfield Road

Peak Hour	WBL	WBR	NBT	NBR	SBL	SBT
AM	0	9	76	0	12	122
PM	0	56	414	0	32	276

Figure 1 summarizes all the generated trips at the entrances of the developments.

Figure 1 - Summary of the Trips Generated by the Developments



4.3 Trip Assignment

4.3.1 Trip Assignment during the peak hours

The trip distributed at each access point to the development will impact the traffic on the other access point. This means, for example, that the traffic exiting the recreational component and turning left into CR 28 will increase the traffic volumes on CR 28 intersection with Moore Drive and similarly for the other access points. The total traffic volumes with the consideration of both development components at each access point are presented in Tables 27 – 33. It is worth mentioning that the volumes in Table 27 and Table 28 are based on the background traffic at CR 28 and Moore Drive, while the volumes in Table 29, Table 30, and Table 31 are based on the background traffic at CR 28 and Syer Line. This was assumed based on the proximity of the entrances to the intersections. Also, it is assumed that 10% of the traffic exiting the main entrance of the recreational development and heading to the north will enter the residential development on Moore Drive during the AM and PM peak hours. It is also assumed that 10% of the traffic exiting the residential development on Moore Drive will enter the recreational development through the main entrance during the PM peak hour.

It is worth noting that the traffic volumes between intersection may not balance since the traffic counts are used from multiple sources and were collected at different timings.

Table 27 - The Turning Movements at the Intersection of CR 28 and Moore Drive

	EBL	EBR	NBL	NBT	SBT	SBR
AM Peak Hour						
2021	147	127	56	449	378	42
2026	149	129	57	493	414	43
2031	151	131	59	541	453	44
PM Peak Hour						
2021	80	108	137	471	922	170
2026	82	110	138	505	968	172
2031	84	113	139	542	1018	175

Table 28 - The Turning Movements at the Residential Component Entrance on CR 28

	EBL	EBR	NBL	NBT	SBT	SBR
AM Peak Hour						
2021	16	13	5	489	501	4
2026	16	13	5	534	538	4
2031	16	13	5	584	580	4
PM Peak Hour						
2021	8	11	14	600	1019	19
2026	8	11	14	634	1067	19
2031	8	11	14	673	1120	19

Table 29 - The Turning Movements at the Secondary Entrance of the Recreational Component on CR 28

	EBL	EBR	NBL	NBT	SBT	SBR
AM Peak Hour						
2021	1	1	10	450	450	8
2026	1	1	10	490	482	8
2031	1	1	10	535	517	8
PM Peak Hour						
2021	8	11	85	701	929	115
2026	8	11	85	746	978	115
2031	8	11	85	795	1033	115

Table 30 - The Turning Movements at the Main Entrance of the Recreational Component on CR 28

	EBL	EBR	NBL	NBT	SBT	SBR
AM Peak Hour						
2021	16	13	29	444	428	23
2026	16	13	29	484	460	23
2031	16	13	29	529	495	23
PM Peak Hour						
2021	146	199	261	640	576	356
2026	146	199	261	685	626	356
2031	146	199	261	734	680	356

Table 31 - The Turning Movements at the Intersection of CR 28 and Syer Line

	EBL	EBR	NBL	NBT	SBT	SBR
AM Peak Hour						
2021	9	9	5	463	437	4
2026	10	10	6	503	468	4
2031	11	11	6	546	503	5
PM Peak Hour						
2021	9	6	8	892	766	9
2026	10	7	9	936	814	10
2031	11	7	10	985	868	11

Table 32 - The Turning Movements at the Intersection of CR 28 and CR 11

	WBL	WBR	NBT	NBR	SBL	SBT
AM Peak Hour						
2021	2	7	687	2	5	497
2026	2	8	750	2	6	534
2031	3	9	821	3	6	575
PM Peak Hour						
2021	3	2	766	0	5	1159
2026	4	2	818	0	6	1220
2031	4	3	874	0	6	1287

Table 33 - The Turning Movements at the Intersection of CR 28 and Whitfield Road

	WBL	WBR	NBT	NBR	SBL	SBT
AM Peak Hour						
2021	18	55	455	11	39	399
2026	19	59	495	11	42	428
2031	21	63	538	11	44	460
PM Peak Hour						
2021	14	101	755	12	79	691
2026	15	105	790	13	84	734
2031	15	110	830	13	88	782

4.3.2 Trip Assignment during a Sold-out Event for the Outdoor Amphitheatre

It is assumed that 70% of the inbound traffic for the outdoor amphitheater will be assigned to the main entrance and the rest (30%) will be assigned for the secondary entrance of the recreational component. Since a sold-out event is assumed to be held after the PM peak hour, the traffic during the off-peak hour is assumed to be equal to the lowest traffic volumes observed during the traffic count collection for this study which is between 1:30 pm and 2:30 pm at CR 28 intersection with Moore Drive as shown in Appendix C. Accordingly, the northbound and southbound traffic at the entrances on CR 28 will be 249 veh/day and 256 veh/day, respectively. This means that the directional split for the off-peak period is almost 50/50. However, due to the nature of this development and its proximity to the City of Peterborough (north of the development), it is assumed that southbound entering traffic is 60% while the northbound entering traffic is 40%

Based on the temporal distribution of the arrival trips discussed before and the trip distribution, the inbound traffic volumes at the entrances of the recreational component are summarized in Table 34 and Table 35.

Table 34 - The Turning Movements at the Main Entrance of the Recreational Component during Spectators Arrival Peak

	EBL	EBR	NBL	NBT	SBT	SBR
Off Peak Hour						
2021	0	0	548	602	256	823
2026	0	0	548	627	283	823
2031	0	0	548	656	312	823

Table 35 - The Turning Movements at the Secondary Entrance of the Recreational Component during Spectators Arrival Peak

	EBL	EBR	NBL	NBT	SBT	SBR
Off Peak Hour						
2021	0	0	235	249	1079	353
2026	0	0	235	275	1105	353
2031	0	0	235	304	1135	353

For the outbound traffic, it is anticipated that all the vehicles will leave the venue once the event is done, which is typical for these big events. Accordingly, the total traffic

volumes at the entrances at the end of a sold-out event will be 3013 vehicles based on the assumptions discussed before in the trip generation section. This traffic volume will split into 70% and 30% on both exits and it is assumed that the directional distribution at the exit is 60% and 40% heading north and south, respectively. Accordingly, the traffic exiting the main entrance will be 844 vehicles turning right on CR 28 and 1265 vehicles turning left on CR 28. Similarly, the secondary entrance will be used by 362 vehicles turning right on CR 28 and 542 vehicles turning left on CR 28. The turning volumes at the entrances are presented in Table 36 and Table 37.

Table 36 - The Turning Movements at the Main Entrance of the Recreational Component after the End of a Sold-out Event

	EBL	EBR	NBL	NBT	SBT	SBR
Off Peak Hour						
2021	1265	844	0	249	618	0
2026	1265	844	0	275	644	0
2031	1265	844	0	304	674	0

Table 37 - The Turning Movements at the Secondary Entrance of the Recreational Component after the End of a Sold-out Event

	EBL	EBR	NBL	NBT	SBT	SBR
Off Peak Hour						
2021	542	362	0	1304	256	0
2026	542	362	0	1329	283	0
2031	542	362	0	1358	312	0

4.4 Existing and Future Traffic Operation with the Development Consideration

Again, Synchro 9 software was used to model the traffic at the adjacent intersections. The model aims at assessing the traffic operation performance at these locations without any modifications to the existing intersections. Different scenarios with the consideration of the traffic generated from the development were assessed including the current year (2021) and the horizon years (2026 and 2031) for both AM and PM peak hours. The traffic volumes used in this assessment ae summarized in Table 27 and Table 31. The results summary is presented in Table 38 and Table 39. The details of the simulation models and full results can be found in Appendix G. The sold-out event scenario is not modeled since it is not the typical scenario for this development and the traffic operation measures are anticipated to deteriorate significantly in this scenario due to the anticipated traffic volumes.

The traffic operation performance for the background traffic and the traffic with the developments consideration at CR 28 intersection with Moore Drive are compared without any modification to the roadway existing conditions. Accordingly, the LOSs for the AM peak LOSs for CR 28 will remain the same before and after adding the development impact; however, the PM peak LOSs will deteriorate significantly. For Moore Drive, the LOSs are expected to have a huge reduction and a huge raise in v/c ratio.

On the other hand, for Syer Line intersection with CR 28 and based on the assumptions mentioned above, the LOSs on CR 28 will slightly decrease from "A" to "B" after adding the developments impact for the PM peak. For Syer Line, the LOSs will also decrease but the v/c ratios will remain low (v/c=0.376 in 2031 scenario) which indicates the traffic will operate at an acceptable level.

For the intersection of CR 28 and CR 11, the LOSs during the AM peak for all scenarios remained the same at LOS "C" on CR 11 as shown in Table 40. On the other hand, the LOSs during the PM peak hour and after adding the impact of the development, the LOSs dropped significantly from "C" to "F". However, the v/c ratios for all scenarios will remain within the acceptable limits.

For the intersection of CR 28 and Whitfield Road, the LOSs will drop during the AM peak hour from "B" to "C" and from "B" and "C" to "E" and "F" during the PM peak as show in Table 41. It is also noticed that the v/c ratios will remain within the acceptable limits.

Table 38 – Traffic Operation Measures at CR 28 & Moore Drive Intersection based on the Future Traffic Condition with the Consideration of the Developments

	EB	NBL	SB
AM Peak Hour			
2021	2.686 (F)	0.087 (A)	-
2026	3.206 (F)	0.093 (A)	-
2031	3.978 (F)	0.1 (A)	-
PM Peak Hour			
2021	4.737 (F)	0.347 (C)	-
2026	6.238 (F)	0.37 (C)	-
2031	8.387 (F)	0.398 (C)	-

* LOS (v/c ratio)

Table 39 – Traffic Operation Measures at CR 28 & Syer Line Intersection based on the Future Traffic Condition with the Consideration of the Developments

	EB	NBL	SB
AM Peak Hour			
2021	0.095 (C)	0.006 (A)	-
2026	0.116 (C)	0.007 (A)	-
2031	0.142 (C)	0.007 (A)	-
PM Peak Hour			
2021	0.213 (E)	0.011 (A)	-
2026	0.275 (F)	0.014 (B)	-
2031	0.357 (F)	0.016 (B)	-

* LOS (v/c ratio)

Table 40 – Traffic Operation Measures at CR 28 & CR 11 Intersection based on the Future Traffic Condition with the Consideration of the Developments

	WB	NB	SBL
AM Peak Hour			
2021	0.031 (C)	-	0.006 (A)
2026	0.037 (C)	-	0.008 (A)
2031	0.055 (C)	-	0.009 (A)
PM Peak Hour			

2021	0.064 (F)	-	0.007 (A)
2026	0.104 (F)	-	0.009 (A)
2031	0.127 (F)	-	0.009 (B)

* LOS (v/c ratio)

Table 41 – Traffic Operation Measures at CR 28 & Whitfield Road Intersection based on the Future Traffic Condition with the Consideration of the Developments

	EB	NBL	SB
AM Peak Hour			
2021	0.183 (C)	-	0.04 (A)
2026	0.212 (C)	-	0.045 (A)
2031	0.253 (C)	-	0.049 (A)
PM Peak Hour			
2021	0.494 (D)	-	0.107 (B)
2026	0.575 (E)	-	0.118 (B)
2031	0.66 (F)	-	0.128 (B)

* LOS (v/c ratio)

In summary, the traffic impact of the development on the intersection of CR 28 and Moore Drive is significant and needs mitigation measures to be applied as will be discussed later in this report. Conversely, the developments impact on CR 11, Syer Line, and Whitfield Road intersections with CR 28 is within the acceptable traffic operation levels. Most of this impact will be noticed on CR 11, Syer Line, and Whitfield Road, which are side roads. Also, it is anticipated that the LOS for the southbound lane of CR 28 at the intersection of Whitfield Road will drop slightly from "A" to "B" but still within the acceptable limits.

It is worth mentioning that the modelling effort carried out at the intersections of CR 28 and Whitfield Road assumed no existing left turn lane. However, a left turn lane will be needed for the southbound left turn movement at the intersection of CR 28 and Whitfield Road based on the background traffic as discussed earlier in this report. Therefore, the intersections of CR 28 and Syer Line and CR 28 and Whitfield Road should be re-evaluated by the County based on the approved improvements that will be carried out at the intersection of Whitfield Road and CR 28.

5.0 Auxiliary Lanes with the Consideration of the Proposed Developments

The warrants for auxiliary lanes are examined in this section in accordance with Appendix 9A of MTO's *Design Supplement for the 2017 Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads*[4]. The need for a left-turn lane at an unsignalized intersection as established by the Design Supplement, Chapter 9A is based on the advancing traffic volume (V_A), the opposing traffic volume (V_O), the

[4] Transportation Association of Canada (TAC). Geometric Design Guide for Canadian Roads: Design Controls, Classification and Consistency. Transportation Association of Canada, 2017.

left-turning traffic volume (V_L), and the percentage of left-turning traffic in the advancing volume (LT%).

For the right-turn lane warrant analysis at the entrance of the development, the TAC Manual specifies that right-turn lanes should be considered "*when the volume of decelerating or accelerating vehicles compared with through traffic volumes causes undue hazard.*" According to the County of Peterborough guidelines, a turn lane or taper may be required based on the Virginia Department of Transportation (VDOT) warrant criteria. Since the TAC does not provide a quantitative method to determine the need for right-turn lanes, the reliance in this section will be on the County of Peterborough guidelines.

5.1 The Intersection of CR 28 and Moore Drive

This intersection was assessed for the existing conditions and the results revealed that a right turn taper for southbound and a left turn lane for the northbound are needed. Accordingly, these improvements will be needed with the development. Additionally, based on the southbound right turning volumes shown in Table 27 and according to the County's guidelines, a full-width right turn lane will be required.

5.2 The Intersection of CR 28 and CR 11

As shown in Table 42, the left-turning volumes are less than 10 vph in all the peak hours for the current and the horizon years. Based on these low volumes, there is no need for a left turning lane at this entrance.

Table 42 – Left Turning Volume Calculations for the Intersection of CR 28 and CR 11

	V_L	V_A	LT%	V_O
AM Peak				
2021	5	502	1%	689
2026	6	540	1%	753
2031	6	581	1%	823
PM Peak				
2021	5	1164	0%	766
2026	6	1226	0%	818
2031	6	1293	0%	874

Also, there is no need for a right turn lane/taper since the northbound right turning volume into CR 11 is none during the PM peak hour and a maximum of 3 veh/hr during the AM peak hour.

5.3 The Intersection of CR 28 and Residential Component Entrance

As shown in Table 43, the left-turning volumes are less than 15 vph in all the peak hours for the current and the horizon years. Based on these low volumes, there is no need for a left turning lane at this entrance. Also, with the signalization of Moore Drive intersection, this relatively low volume is not anticipated to interrupt the traffic operation

on CR 28 even after the addition of a left turn lane for Moore Drive. The proposed location of the entrance meets the visibility requirements in the Peterborough County by-law no. 2012-26.

Table 43 – Left Turning Volume Calculations for Residential Component entrance on CR 28

	V_L	V_A	LT%	V_O
AM Peak				
2021	5	495	1%	505
2026	5	540	1%	543
2031	5	589	1%	585
PM Peak				
2021	14	613	2%	1038
2026	14	648	2%	1086
2031	14	687	2%	1139

Based on the right turning traffic volumes anticipated for the southbound direction (ranging from 4 to 19 veh/hr during the AM and PM peak in 2031 as shown in Table 28), a right turn taper is not warranted since the volumes are less than 20 veh/hr based on the County of Peterborough guidelines.

5.4 The Intersection of CR 28 and the Secondary Entrance of the Recreational Component

Table 44 shows the left-turn lane calculations. For the AM peak, the anticipated percentage of the left turning vehicle is low, while the PM peak has considerable left-turning volumes. Based on these volumes, a left turn lane is required at the secondary entrance of the recreational development.

Based on the County of Peterborough guidelines and the right turning traffic volumes anticipated for the southbound direction during the PM peak (115 veh/hr as shown in Table 29), a full-width right turn lane and a taper are warranted.

Table 44 – Left Turning Volume Calculations for Recreational Component Secondary Entrance on CR 28

	V_L	V_A	LT%	V_O
AM Peak				
2021	10	460	2%	458
2026	10	500	2%	490
2031	10	545	2%	525
PM Peak				
2021	85	786	11%	1044
2026	85	831	10%	1094
2031	85	880	10%	1149

5.5 The Intersection of CR 28 and the Main Entrance of the Recreational Component

The existing condition at the main entrance of the recreational component has already both right turn and left-turn lanes. Therefore, the analysis for auxiliary lanes analysis for this entrance is not required; however, a traffic signal warrant analysis is required as will be discussed later.

5.6 The Intersection of CR 28 and Whitfield Road

The existing condition for this intersection has been assessed and a left-turn lane is needed at this intersection. Also, there is already an existing right turn lane at this intersection for the northbound direction. Therefore, the analysis for auxiliary lanes analysis for Whitfield Road is not required; however, a traffic signal warrant analysis is required as will be discussed later.

6.0 Traffic Signal Warrant Analyses with the Developments Impact Consideration

Due to the considerable traffic volumes that will be generated by the developments, traffic signal warrant analyses are carried out to investigate the need for traffic signals at the intersections of CR 28 with Moore Drive, and the main and secondary entrances of the recreational component on CR 28.

According to the Ontario Traffic Manual (OTM) Book 12 – Traffic Signals, the need for a traffic signal for a future scenario will follow Justification 7 – Projected Volumes. This justification assumes two basic scenarios; one of them meets the case of the Study Area, where an intersection already exists and a proposed development or developments will add more traffic to that intersection. Since the future eight-hour volumes with the additional volumes due to the impact of the developments are not available and will not be predicted with sufficient accuracy, the OTM suggested the analysis of the justification using the Peak Hour Volume (PHV) and reduced to the Average Hour Volume (AHV). According to the OTM, the AHV will be calculated as follow:

$$AHV = \frac{PHV}{2}$$

Due to the fluctuation of the traffic volumes during the AM and the PM peak hours, the traffic warrants will be carried out for both peak hours to account for the worst case.

6.1 The Intersection of CR 28 and Moore Drive

To investigate the traffic signal warrant, the above equation is applied to the volumes of CR 28 intersection with Moore Drive during both the AM and PM peak hours in 2031, which are presented in Table 27. Accordingly, the AHVs for this intersection are shown in Table 45.

Table 45 – AHV based on Peak Hours for CR 28 and Moore Drive Intersection

	EBL	EBT	NBL	NBT	SBT	SBR
2031 (AM Peak)	76	66	29	270	227	22
2031 (PM Peak)	42	56	70	271	509	87

Based on the estimated AHVs, the analysis for Justification 7 was conducted as shown in Table 46. As seen from the compliance percentages, the estimated AHVs are not fulfilling the volume requirements to justify a traffic signal for the worst-case future scenario in 2031.

Table 46 – Traffic Signal Warrant Calculations for CR 28 and Moore Drive Intersection

Justification	Guidance Approach Lanes (1 lane)	20% Threshold Increase as per OTM	Estimated AHV	COMPLIANCE %
Flow Condition	Free Flow			
AM Peak Hour				
1. Minimum Vehicular Volume	480	576	690	120%
	120	216*	141	65%
2. Delay to Cross Traffic	480	576	549	95%
	50	60	76	126%
PM Peak Hour				
1. Minimum Vehicular Volume	480	576	1035	180%
	120	216*	98	45%
2. Delay to Cross Traffic	480	576	937	163%
	50	60	42	70%

* Volume requirements to be increased by 20% for an existing intersection when using the AHV approach as per OTM guidelines.
*Volume requirements to be increased by 50% for a T-intersection.

Based on the OTM procedure and the results reported above, the intersections between CR 28 and Moore Drive is not justified for traffic signal controls in the future with the developments in place. However, as shown in Table 46, a traffic signal warrant is close to be justified. Therefore, a traffic signal control should be considered for this location to address the LOS F and the over-capacity operation (shown in Table 38), which is anticipated in the future when the development is in full operation.

6.2 The Intersection of CR 28 and CR 11

The AHVs at the intersection of CR 28 and CR 11during both the AM and PM peak hours in 2031 are shown in Table 47. These AHVs are based on the volumes summarized in Table 32.

Table 47 – AHV based on Peak Hours for CR 28 and CR 11 Intersection

	WBL	WBR	NBT	NBR	SBL	SBT
2031 (AM Peak)	1	5	410	1	3	287
2031 (PM Peak)	2	1	437	0	3	643

Table 48 – Traffic Signal Warrant Calculations for CR 28 and CR 11 Intersection

Justification	Guidance Approach Lanes (1 lane)	20% Threshold Increase as per OTM	Estimated AHV	COMPLIANCE %
Flow Condition	Free Flow			
AM Peak Hour				
1. Minimum Vehicular Volume	480	576	708	123%
	120	216*	6	3%
2. Delay to Cross Traffic	480	576	702	122%
	50	60	1	2%
PM Peak Hour				
1. Minimum Vehicular Volume	480	576	1087	189%
	120	216*	3	1%
2. Delay to Cross Traffic	480	576	1084	188%
	50	60	2	3%

* Volume requirements to be increased by 20% for an existing intersection when using the AHV approach as per OTM guidelines.
*Volume requirements to be increased by 50% for a T-intersection.

Based on the estimated AHVs, the analysis for Justification 7 was conducted as shown in Table 48. Although CR 28 is anticipated to have significant number of traffic, the estimated AHVs are not fulfilling the volume requirements to justify a traffic signal for the worst-case future scenario in 2031 due to the substantially low traffic volume on CR 11.

6.3 The Intersection of CR 28 and Residential Component Entrance

Again, the AHV methodology is used for this intersection for both the AM and PM peak hours. The volumes at the entrance of the residential component on CR 28 during both the AM and PM peak hours in 2031 are presented in Table 28. Accordingly, the AHVs for this intersection are shown in Table 49.

Table 49 – AHV based on Peak Hours for
CR 28 and the Entrance of the Residential Component

	EBL	EBT	NBL	NBT	SBT	SBR
2031 (AM Peak)	8	7	3	292	290	2
2031 (PM Peak)	4	6	7	336	560	10

Table 50 – Traffic Signal Warrant Calculations for CR 28 and Residential Entrance

Justification	Guidance Approach Lanes (1 lane)	20% Threshold Increase as per OTM	Estimated AHV	COMPLIANCE %
Flow Condition	Free Flow			
AM Peak Hour				
1. Minimum Vehicular Volume	480	576	601	104%
	120	216*	15	7%
2. Delay to Cross Traffic	480	576	587	102%
	50	60	8	13%
PM Peak Hour				
1. Minimum Vehicular Volume	480	576	923	160%
	120	216*	10	4%
2. Delay to Cross Traffic	480	576	913	159%
	50	60	4	7%

* Volume requirements to be increased by 20% for an existing intersection when using the AHV approach as per OTM guidelines.
*Volume requirements to be increased by 50% for a T-intersection.

Based on the estimated AHVs, the analysis for Justification 7 was conducted as shown in Table 49. As seen from the compliance percentages, the estimated AHVs are not fulfilling the volume requirements to justify a traffic signal for the worst-case future scenario in 2031.

6.4 The Intersection of CR 28 and Recreational Component Secondary Entrance

Since the secondary entrance is not anticipated to be used heavily during the AM peak hour, the analysis will focus on the PM peak hour and the sold-out event scenarios. The AHV methodology is used for both scenarios at this intersection.

6.4.1 Traffic Signal Warrant Analysis for the Secondary Entrance during the PM Peak Hour

The volumes at the secondary entrance of the recreational component on CR 28 during the PM peak hour in 2031 are presented in Table 29. Accordingly, the AHVs for this intersection are shown in Table 51.

Table 51 – AHV based on the PM Peak Hour
at the Secondary Entrance of the Recreational Component

	EBL	EBT	NBL	NBT	SBT	SBR
2031 (PM Peak)	4	6	42	398	517	58

Table 52 – Traffic Signal Warrant Calculations for the Secondary Entrance and CR 28 Intersection

Justification	Guidance Approach Lanes (1 lane)	20% Threshold Increase as per OTM	Estimated AHV	COMPLIANCE %
Flow Condition	Free Flow			
1. Minimum Vehicular Volume	480	576	1024	178%
	120	216*	10	5%
2. Delay to Cross Traffic	480	576	1014	176%
	50	60	4	7%

* Volume requirements to be increased by 20% for an existing intersection when using the AHV approach as per OTM guidelines.
*Volume requirements to be increased by 50% for a T-intersection.

Based on the estimated AHVs, the analysis for Justification 7 was conducted as shown in Table 52. As seen from the compliance percentages, the estimated AHVs are not fulfilling the volume requirements to justify a traffic signal for the worst-case future scenario in 2031. It is worth noting that the volumes exiting from this entrance are anticipated to be low during the PM peak hour since most of the traffic will be entering the development during the PM peak hour and exiting later based on the nature of the recreational component and the assumptions mentioned before in the trip generation section.

6.4.2 Traffic Signal Warrant Analysis for the Secondary Entrance during a Sold-out Event

The critical case for the traffic signal warrant at this entrance is when the event is over and the vehicles are heading out from the secondary entrance. The volumes at the secondary entrance of the recreational component on CR 28 after the sold-out event are presented in Table 36. Accordingly, the AHVs for this intersection are shown in Table 53.

Table 53 – AHV based on the PM Peak Hour at the Secondary Entrance of the Recreational Component After the End of the Sold-out Event

	EBL	EBT	NBL	NBT	SBT	SBR
2021 (Off Peak)	271	181	0	757	128	0

Based on the estimated AHVs, the analysis for Justification 7 was conducted as shown in Table 54. As seen from the compliance percentages, the estimated AHVs are fulfilling the volume requirements to justify a traffic signal in 2021 after a sold-out event. It is worth noting that these type of events will be held occasionally and during the summer season only. Therefore, a traffic signal option may be considered at this entrance keeping in mind that this signal should have a special timing plan design for special events. Nevertheless, it is understood that for especial events, event staff typically develop an event-specific traffic control plan and provide adequate staffing and traffic control personnel to direct traffic (both pedestrian and vehicular) accordingly and in as safe and organized manner as possible within the site to minimize disruption to main street traffic as much as possible.

Table 54 – Traffic Signal Warrant Calculations for the Secondary Entrance of the Recreational Component after the End of the Sold-out Event

Justification	Guidance Approach Lanes (1 lane)	20% Threshold Increase as per OTM	Estimated AHV	COMPLIANCE %
Flow Condition	Free Flow			
1. Minimum Vehicular Volume	480	576	1337	232%
	120	216*	452	209%
2. Delay to Cross Traffic	480	576	885	154%
	50	60	271	452%

6.5 The Intersection of CR 28 and Recreational Component Main Entrance

Since the critical traffic condition (higher traffic volumes during peak hours) of the main entrance is anticipated to be during the PM peak hour, the analysis will focus on the PM peak hour and the sold-out event scenarios. The AHV methodology is used for both scenarios at this intersection.

6.5.1 Traffic Signal Warrant Analysis for the Main Entrance during the PM Peak Hour

The volumes at the main entrance of the recreational component on CR 28 during the PM peak hour in 2021 are presented in Table 30. Accordingly, the AHVs for this intersection are shown in Table 55.

Table 55 – AHV based on the PM Peak Hour at the Main Entrance of the Recreational Component

	EBL	EBT	NBL	NBT	SBT	SBR
2021 (PM Peak)	73	99	131	320	288	178

Table 56 – Traffic Signal Warrant Calculations for the Main Entrance of the Recreational Development on CR 28

Justification	Guidance Approach Lanes (1 lane)	20% Threshold Increase as per OTM	Estimated AHV	COMPLIANCE %
Flow Condition	Free Flow			
1. Minimum Vehicular Volume	480	576	1089	189%
	120	216*	172	80%
2. Delay to Cross Traffic	480	576	916	159%
	50	60	73	122%

* Volume requirements to be increased by 20% for an existing intersection when using the AHV approach as per OTM guidelines.
*Volume requirements to be increased by 50% for a T-intersection.

Based on the estimated AHVs, the analysis for Justification 7 was conducted as shown in Table 56. As seen from the compliance percentages, the estimated AHVs are fulfilling at least 80% of the volume requirements to justify a traffic signal in 2021, which means a traffic signal will be required once the development is in full operation. The warrant

analysis is not required for the horizon years since the traffic volumes of current year scenario justifies the need for a traffic signal.

6.5.2 Traffic Signal Warrant Analysis for the Main Entrance during a Sold-out Event

Since a traffic signal is already warrant for this entrance even before the sold-out event impact, the traffic signal warrant for the sold-out event case at this entrance is not required. However, the traffic signal and entrance design should consider the amount of traffic that will be using the entrances/exits during the sold-out event and design a special timing plan for these occasions. Also, it is understood that, in such cases, event staff typically develop an event-specific traffic control plan and provide adequate staffing and traffic control personnel to direct traffic (both pedestrian and vehicular) accordingly and in as safe and organized manner as possible within the site to minimize disruption to main street traffic as much as possible.

6.6 The Intersection of CR 28 and Whitfield Road

The traffic volumes at the intersection of CR 28 and Whitfield Road are summarized in Table 33. Based on these volumes, the AHVs are estimated for both the AM and PM peak hours as shown in Table 57.

Table 57 – AHV based on the Peak Hours
at the intersection of CR 28 and Whitfield Road

	WBL	WBT	NBT	NBR	SBL	SBT
2031 (AM Peak)	10	31	269	6	22	230
2031 (PM Peak)	8	55	415	6	44	391

Table 58 – Traffic Signal Warrant Calculations
for the Intersection of CR 28 and Whitfield Road

Justification	Guidance Approach Lanes (1 lane)	20% Threshold Increase as per OTM	Estimated AHV	COMPLIANCE %
Flow Condition	Free Flow			
AM Peak Hour				
1. Minimum Vehicular Volume	480	576	569	99%
	120	216*	42	19%
2. Delay to Cross Traffic	480	576	527	91%
	50	60	10	17%
PM Peak Hour				
1. Minimum Vehicular Volume	480	576	919	159%
	120	216*	62	29%
2. Delay to Cross Traffic	480	576	856	149%
	50	60	8	13%

* Volume requirements to be increased by 20% for an existing intersection when using the AHV approach as per OTM guidelines.
*Volume requirements to be increased by 50% for a T-intersection.

Based on the estimated AHVs, the analysis for Justification 7 was conducted as shown in Table 58. Based on the compliance percentages, a traffic signal installation at this intersection is not warranted, despite the high traffic volumes on the main road (i.e. CR 28).

7.0 Traffic Analyses at Highway 115 South Off-Ramp

7.1 Traffic Signal Warrant / Ramp Metering Warrant

Based on MTO's comments, the need for a traffic signal at highway 115 south off-ramp should be discussed. The traffic flow on the off-ramp is merging on CR 28 and there is no crossing or left turning movements from the ramp to CR 28 at this location. Also, the traffic travelling eastbound on Highway 115 and heading north on Highway 7 uses the north off-ramp (Ramp 52) as shown in Appendix H. Therefore, the traffic signal warrant methodology provided in OTM – Book 12 is not applicable in this situation. Instead of this methodology, the ITS Service Book: ITS903 – Freeway Ramp Metering v1.1 modified on March 26, 2020 is applied. To investigate the warrant of a ramp metering at this off-ramp, the traffic volumes on the ramp and on CR 28 are acquired from the MTO. The available traffic volumes were collected in summer 2016 as detailed in Appendix H. Since the PM peak hour is critical in terms of the generated trips, the focus of the analyses will be on the PM peak hour only. The traffic volumes for the PM peak hour on the ramp is extracted for Thursday PM peak hour between 4 pm and 5 pm, which has the highest traffic on the ramp on a weekday. The PM peak hour through traffic on CR 28 is extracted from the turning movements at the intersection of Highway 7 and MTO yard and the signalized intersection of Highway 7 and Highway 115 north/south off-ramp, which are located just to the north of the south off-ramp. The extracted traffic volumes are shown in Table 59.

Table 59 – Summary of Traffic Data at the Interchange of Hwy 115 and Hwy7/CR28

	Ramp 59 (Hwy 115 South Off-Ramp)			Ramp 31 (Hwy 115 North/South Off-Ramp)		
2016 (PM Peak)	27			443		
At the Intersection of Hwy 7 and MTO Yard						
	WB	EB	NBL	NBT	SBT	SBR
2016 (PM Peak)	0	0	13	423	226	148

The traffic volumes on Ramp 31 is split into right (heading northbound on Highway 7) and left (heading southbound on Highway 7) turning volumes based on the NB and SB through movement ratios at the intersection of Highway 7 and MTO yard. Accordingly, it is assumed that 154 vph will be heading south on Highway 7 as summarized in Figure 2. Using the annual growth rate assumed before (2%), the traffic volumes for the horizon years are shown in Table 60.

Figure 2 – Summary of the 2016 Traffic Volumes in the Vicinity of Highway 115 South Off-Ramp

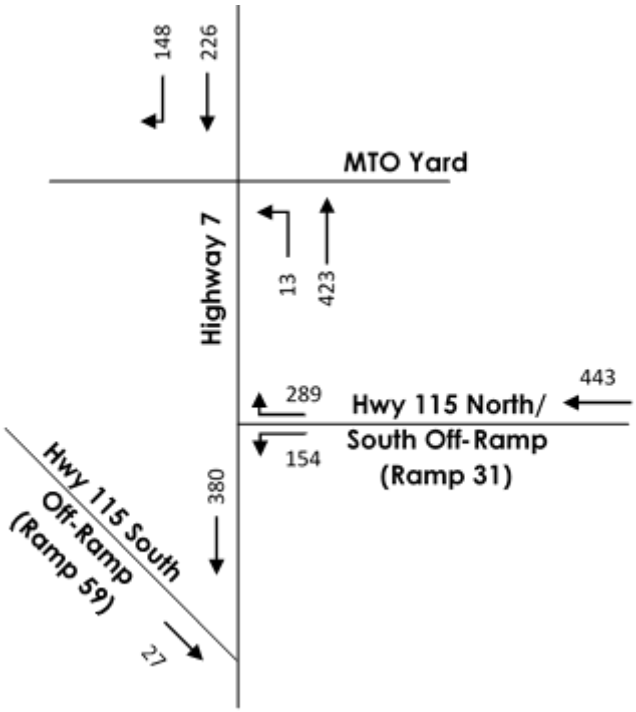


Table 60 – Available and Anticipated Future Traffic Volumes at Ramp 59

	Ramp 59	SB
2016 (PM Peak)	27	380
2031 (PM Peak)	36	511

Based on the generated trips for the developments as summarized in Figure 1, the anticipated traffic volumes added to CR 28 due to the development will be 632 vph during the PM peak hour. These volumes are distributed on the ramp and the through movement on Highway 7 based on the ratio between the SB and Ramp 59 volumes. The results are summarized in Table 61.

Table 61 – Summary of background, Development only, and Total Traffic Volumes

	Ramp 59	SB
Background Traffic 2031 (PM Peak)	36	511
Developments Traffic 2031 (PM Peak)	42	591
Total Traffic 2031 (PM Peak)	78	1102

According to Highway Capacity Manual 2010 Exhibit 13-9, the capacity of a highway segment within the merge influence area is about 2000 pc/h for an 80 km/h segments (50 mph). Based on the 2031 volumes shown in Table 61, the total volume is 1180 vph or 1304 pc/h, assuming 10% trucks. Therefore, the anticipated volume-to-capacity ratio is about 0.65 in 2031, which is the worst-case scenario based on the assumptions discussed above. According to the ITS903 – Freeway Ramp Metering v1.1, a ramp metering system is not warrant if the corridor is typically operating under 95% capacity

during the peak hours. Hence, a ramp metering system is not warranted in this case. However, this ramp should be re-assessed in the future given any change in the travel pattern or any new developments around CR 28.

7.2 Merge Segment Analysis

The merge segment downstream Highway 115 south off-ramp is also analyzed to estimate the level of service according to the Highway Capacity Manual (HCM) 2010. The methodology in the HCM can be applied in an approximate manner to two-lane highways and it is assumed that this methodology can be applied to the case of CR 28 and the Highway 115 south off-ramp. The following parameters of the total future traffic are used in Equation 13-21 in the HCM 2010 to estimate the density (assuming 10% truck percentage):

- v_R (flow rate on the off-ramp) = 78 vph = 86 pc/h
- v_{12} (flow rate on freeway lanes 1 and 2 immediately upstream of the ramp influence area) = 1102 vph = 1218 pc/h
- L_A (the length of the acceleration taper as shown in Exhibit 13-3 in the HCM 2010) ~ 150 m = 492 ft
- PHF = 0.95

Accordingly, the density in the ramp influence area is equal to 12.5 pc/mi/ln and the level of service based on this density is "B" as shown in Exhibit 13-2 in the HCM. Also, Exhibit 13-10 in the HCM shows that the lowest value of ramp capacity if 1800 pc/h which indicates that the ramp is anticipated to operate significantly below capacity limits. This means even with the presence of the traffic generated by the development in the future, it is anticipated that this section will operate smoothly and will not affect the ramp traffic.

It is worth mentioning that the calculations assessed the existing road geometry (i.e. without signalization at the intersection of CR 28 and Moore Drive or any additional lanes at this intersection) but with the addition of 2031 anticipated development trips. However, the traffic signal design of the intersection of CR 28 and Moore Drive should consider the off-ramp traffic as well.

8.0 Conclusions and Recommendations

This Traffic Impact Study investigates and evaluates the impact of the proposed redevelopment of Kawartha Downs. The background traffic operation and the traffic operation with the consideration of the traffic generated from the development at the intersections of CR 28 and Moore Drive and Syer Line were assessed.

Based on the analysis completed in this study, the new trips generated by the development will have a significant impact on the traffic operation at the entrances of the recreational development on CR 28 and at the intersection of CR 28 and Moore Drive. On the other hand, the impact on Syer Line is not significant given the assumption that no direct access from the development to Syer Line. However, it is known to our

team that the intersection of CR 28 and Whitfield Road will need enhancement, which will have an impact on CR 28 intersection with Syer Line.

Additionally, this study examines the need for auxiliary lanes and traffic signals at the entrances of the developments and at the intersection of CR 28 and Moore Drive.

Based on the assumptions and the methodology followed in this study, the recommendations can be summarized in the following points:

- Improvements required regardless of the development impact
    - At CR 28 intersection with Moore Drive, a left turn lane for the northbound traffic and a right turn taper for the southbound traffic are needed.
- Improvements required with the consideration of the development impact
    - At the intersection of CR 28 and Moore Drive, a full-width right turn lane for the southbound traffic is needed in addition to a left turn lane for the northbound traffic.
    - At the intersection of CR 28 and Moore Drive, it is recommended to consider the installation of a traffic signal at this intersection; however, a traffic signal is not fully warranted. The reason behind recommending a traffic signal is the substantially low LOS and high v/c ratio on Moore Drive after the full operation of the development.
    - Although CR 11 is in a close proximity to CR 28, CR 11 will not be impact by the installation of traffic signal at the intersection of CR 28 and Moore Drive. This is because the traffic volumes on CR 11 are significantly low (9 to 12 veh/hr during the AM peak and 5 to 7 veh/hr during the PM peak hour for current and future scenarios) based on the counts provided by the County of Peterborough.
    - The entrance of the residential development on CR 28 will not need any auxiliary lanes. Based on the assumptions documented in this report, it is anticipated that 14 vehicles only will turn left from CR 28 to the entrance during the PM peak. This left turning volume is relatively low and with the signalization of Moore Drive intersection, this relatively low volume is not anticipated to interrupt the traffic operation on CR 28 even after the addition of a left turn lane for Moore Drive.
    - Based on discussions with the client, we understand that there is an environmental constraint that will prevent connecting the residential component (52 dwelling units) on CR 28 to the rest of the residential subdivision that will access Moore Drive. The proposed location of the residential entrance on CR 28 meets the Peterborough County by-law no. 2012-26 understanding that the only access available to this portion of land is from CR 28. It is anticipated the entrance will be designed according to this by-law and constructed according to Peterborough County relevant standards.

- At the secondary entrance of the recreational development, a full-width right turn lane for the southbound traffic and a left turn lane for the left turn traffic are needed.
- At the main entrance of the recreational development, a traffic signal is warranted.
- Highway 115 south off-ramp is not warranted for signalization (i.e. ramp metering) according to MTO ITS903 – Freeway Ramp Metering.
- The Peterborough County may consider widening CR 28 as part of a long-term plan (i.e. 30 years, which is beyond the study horizon of this report). If this widening is considered in the future, it is not anticipated to have a significant impact on the results of this report. Nevertheless, the County should review the travel pattern and the traffic conditions on CR 28 and surrounding area by that time.

This study and associated recommendations were completed based on what would be constituted as a 'normal' operational condition in accordance with typical practices. It is understood that due to the nature of the redeveloped venue, large events will be hosted, on an infrequent basis, which would represent an atypical condition. Typically, these events are not usually used as the basis of design, since the remedial measures to accommodate a massive influx/outflux of vehicles in a short time would be uncharacteristic and excessive for a normal condition. This is especially typical for events at locations such as large stadiums and sporting/event venues. In such cases, event staff typically develop an event-specific traffic control plan and provide adequate staffing and traffic control personnel to direct traffic (both pedestrian and vehicular) accordingly and in as safe and organized manner as possible within the site to minimize disruption to main street traffic as much as possible. We understand that this practice will be employed by venue staff and will include the use of multi-lane stacking on the access road within the Kawartha Downs property and event traffic control staff, during these events.

Sincerely,

Mostafa H Tawfeek, Ph.D., P.Eng., RSP1
Traffic Engineer
D.M. Wills Associates Limited

Wes Kingdon, P.Eng.
Project Engineer
D.M. Wills Associates Limited

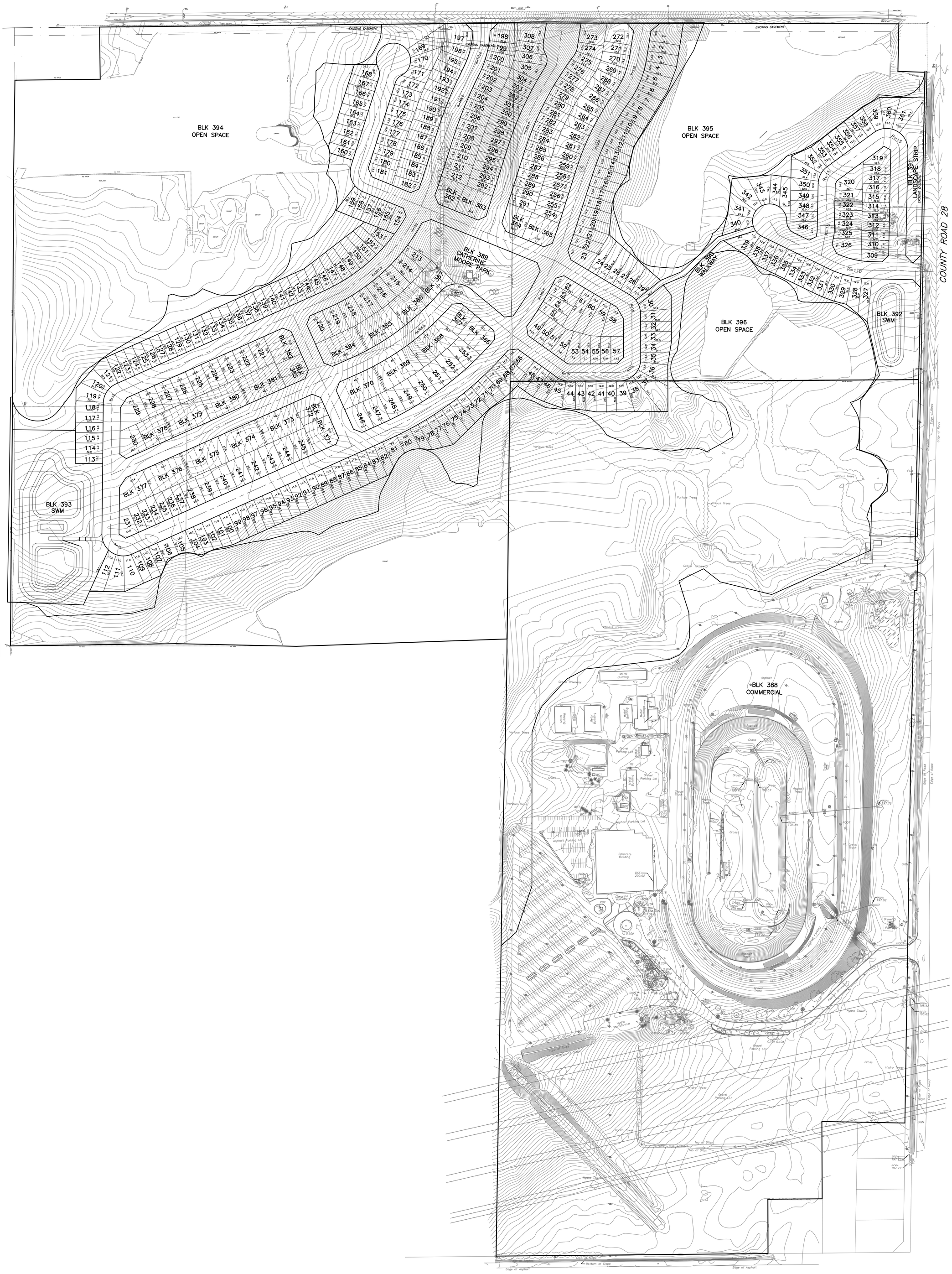
Appendix A

Location Plan

*Not to scale. Approximate location for illustration only.

Appendix B

Draft Plan of Kawartha Downs Redevelopment



LAND USE SCHEDULE

PROPOSED USE	LOT/BLK #	# OF LOTS/BLKS	# OF UNITS	AREA (ha)
LOW DENSITY RESIDENTIAL				
SINGLE DETACHED (11,12m)	1–213, 231–237, 254–361	328	328	
SEMI DETACHED (10m)	214–230, 238–253	33	66	
MEDIUM DENSITY				
BLOCK TOWNHOUSES (7.5m)	362–387	26	123	
TOTAL		387	517	
NON RESIDENTIAL				
COMMERCIAL	388	1		
PARK	389	1		
WALKWAY	390	1		
LANDSCAPE STRIP	391	1		
STORMWATER	392, 393	2		
OPEN SPACE	394–396	3		
ROADS	20.0m ROW			
TOTALS		396	517	107.741

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51 OF THE PLANNING ACT

F NORTH –RESIDENTIAL/AGRICULTURAL
SOUTH –COMMERCIAL
EAST –AGRICULTURAL
WEST –AGRICULTURAL/VACANT
H –PIPED MUNICIPAL WATER
I –TILL
K –ALL MUNICIPAL SERVICES AVAILABLE

OWNER'S AUTHORIZATION

I/WE

BEING THE REGISTERED OWNER OF THE SUBJECT LANDS HEREBY AUTHORIZE

D.G.BIDDLE AND ASSOC. LTD.

TO PREPARE AND SUBMIT A DRAFT PLAN OF SUBDIVISION FOR APPROVAL

SIGNED _____

DATE _____

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARY OF THE LANDS TO BE SUBDIVIDED AS SHOWN ON THIS PLAN AND THEIR RELATIONSHIP TO ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN

SIGNED _____

DATE _____

No.	REVISION	DATE	BY	APPROVED

REVISIONS

PROPOSED

DRAFT PLAN

1683 MOORE DRIVE & 1490 COUNTY ROAD 28

TOWNSHIP OF CAVAN MONAGHAN

D.G. Biddle & Associates Limited
consulting engineers and planners
96 KING STREET EAST • OSHAWA,ON L1H 1B6
PHONE (905)576-8500 • FAX (905)576-9730
info@dgbiddle.com

SCALE:	1:1500
DRAWN BY:	F.H.V.
DESIGN BY:	F.H.V.
CHECKED BY:	M.F.
PLOT DATE:	29/04/2022

DP-1

Y:\JOB FILES\121500\121133 KAWARTHA DOWNS\121133 DRAWINGS\121133 DRAFT PLAN AND CONCEPTUAL SERVICING\121133 DRAFT PLAN.DWG

KAWARTHA DOWNS SITE PROPOSAL STATISTICS

GENERAL:
SITE AREA: 115 acres
EXISTING PARKING: 570 spaces
EXISTING OVAL INFIELD: 13 acres
EXISTING BARNES/SERVICE BUILDINGS: 36,400 sf total

SPECTATORS:
EXISTING GRANDSTAND: 2,000

EVENT CENTRE: 3,200

AMPHITHEATRE: 3,880 raked + 5,000 grass
SOCCER PITCHES: 2,800

EXISTING CASINO AND GRANDSTAND: 50,000 SF

PUBLIC WC'S: 5,000 SF

EVENT CENTRE:
48,300 SF FOOTPRINT
58,500 SF GFA

INDOOR MULTI-USE FIELD
CHANGEROOMS
PUBLIC SOCIAL SPACE
OFFICE AND ADMINISTRATION
PERMANENT SEATING FOR 1,000

EVENT STAGE
BACK-OF HOUSE
RETRACTABLE SEATING FOR 1,000
FLOOR-LEVEL SEATING FOR 1,200

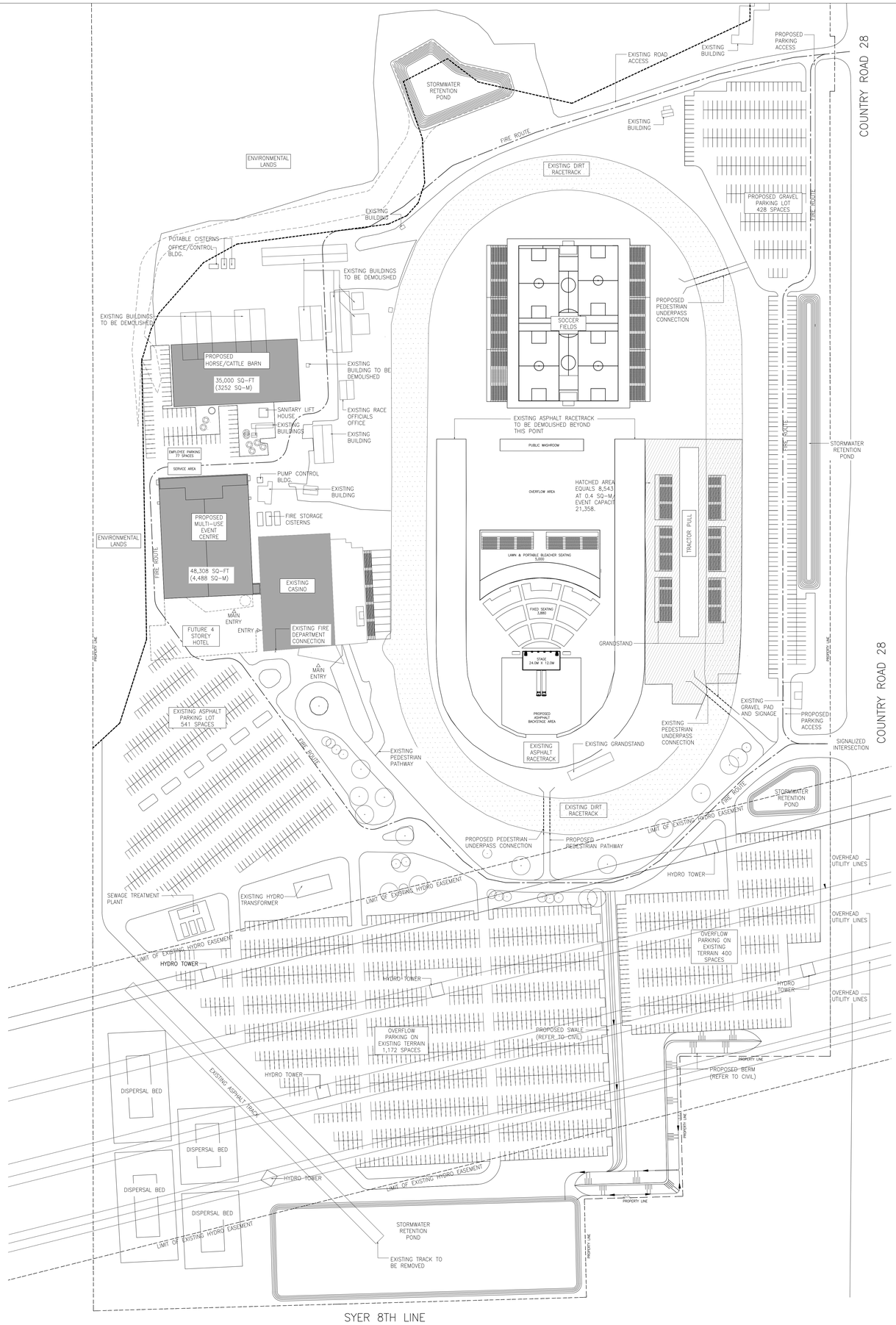
FUTURE HOTEL:

HOTEL STATISTICS

- NUMBER OF FLOORS: 4
- BUILDING HEIGHT 12.2m (EXCLUDING MECHANICAL PENTHOUSE)
- GROUND FLOOR AREA: 1,910 SQ-M (20,559 SQ-FT)
- TOTAL GROSS FLOOR AREA: 5,838 SQ-M (62,840 SQ-FT)
- PROPOSED PARKING: DELETE 56 SPOTS FROM EXISTING LAYOUT

MECHANICAL NOTES 220714

- Peak domestic water demand = 185.1 gpm. We anticipate a 3in water service pipe to support this flow.
- Peak sanitary drainage = 113.7 gpm. We anticipate a 6in sanitary service at 1% slope.
- 15min Storm event per OBC = 2337.8 gpm. We anticipate a single 15in storm connection at 1% slope but I would expect it is more realistic to utilize multiple smaller connections. 4x 10in connections is possible.
- Fire flow = 500 gpm via 6in pipe. Expected water service duration is 90min per NFPA-13 and we recommend adding additional storage to accommodate fire pump testing requirement. 2-3hrs of storage would be appropriate.



1 SITE PLAN
1:1000

Contractor must check and verify all dimensions on the job, and report any discrepancies to the Architect before proceeding with the work.
Do not scale this drawing.

REVISIONS AND ISSUES

REV	DESCRIPTION	DATE
1	ISSUED FOR SPA	06 SEPT 2022

MJMA
maclennan jaunkalns miller architects
425 adelaide street west level 6
toronto ontario m5v 3c1
416.593.6796
www.mjmaarchitects.com

KAWARTHA DOWNS SITE STUDY
1352 County Rd. #28
FRASERVILLE, ON , K0L 1V0
t: 705.939.6316
f: 705.939.6276

KEYPLAN

NORTH ARROW

SEAL

PROJECT TITLE
KAWARTHA DOWNS SITE STUDY

DRAWING TITLE
SITE PLAN
ROOF PLAN

SCALE
1:1000

DATE
09 SEPT 2022

PROJECT NUMBER
2110

DRAWING NUMBER
SPA A001

Appendix C

Traffic Data within the Study Area

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Project #21-102 - D.M. Wills Associates

Intersection Count Report

Intersection:	Peterborough Rd 28 & Moore Dr
Municipality:	Kawartha Downs
Count Date:	Jul 07, 2021
Site Code:	2110200001
Count Categories:	Cars, Trucks, Bicycles, Pedestrians
Count Period:	07:00-18:00
Weather:	Clear

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Map

Intersection:	Peterborough Rd 28 & Moore Dr
Site Code:	2110200001
Municipality:	Kawartha Downs
Count Date:	Jul 07, 2021

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Summary

Intersection: Peterborough Rd 28 & Moore Dr
Site Code: 2110200001
Municipality: Kawartha Downs
Count Date: Jul 07, 2021

Peterborough Rd 28 - Traffic Summary

	North Approach Totals						South Approach Totals						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	Total
07:00 - 08:00	0	343	9	0	352	0	14	418	0	0	432	0	784
08:00 - 09:00	0	262	10	0	272	0	7	312	0	0	319	0	591
09:00 - 10:00	0	261	16	0	277	0	4	276	0	0	280	0	557
10:00 - 11:00	0	264	8	0	272	0	0	273	0	0	273	0	545
11:00 - 12:00	0	302	10	0	312	0	3	360	0	0	363	0	675
12:00 - 13:00	0	374	12	0	386	0	7	355	0	0	362	0	748
13:00 - 14:00	0	282	6	0	288	0	5	279	0	0	284	0	572
14:00 - 15:00	0	270	8	0	278	0	0	236	0	0	236	0	514
15:00 - 16:00	0	368	8	0	376	0	10	265	0	0	275	0	651
16:00 - 17:00	0	417	21	0	438	0	5	298	0	0	303	0	741
17:00 - 18:00	0	306	3	0	309	0	7	263	0	0	270	0	579
GRAND TOTAL	**0**	**3449**	**111**	**0**	**3560**	**0**	**62**	**3335**	**0**	**0**	**3397**	**0**	**6957**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Summary

Intersection: Peterborough Rd 28 & Moore Dr
Site Code: 2110200001
Municipality: Kawartha Downs
Count Date: Jul 07, 2021

Moore Dr - Traffic Summary

	East Approach Totals						West Approach Totals						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	Total
07:00 - 08:00	0	0	0	0	0	0	17	0	20	0	37	0	37
08:00 - 09:00	0	0	0	0	0	0	11	0	15	0	26	0	26
09:00 - 10:00	0	0	0	0	0	0	10	0	6	0	16	0	16
10:00 - 11:00	0	0	0	0	0	0	9	0	5	0	14	0	14
11:00 - 12:00	0	0	0	0	0	0	15	0	10	0	25	1	25
12:00 - 13:00	0	0	0	0	0	0	12	0	11	0	23	0	23
13:00 - 14:00	0	0	0	0	0	0	13	0	3	0	16	0	16
14:00 - 15:00	0	0	0	0	0	0	7	0	6	0	13	0	13
15:00 - 16:00	0	0	0	0	0	0	13	0	16	0	29	0	29
16:00 - 17:00	0	0	0	0	0	0	15	0	20	0	35	0	35
17:00 - 18:00	0	0	0	0	0	0	17	0	5	0	22	0	22
GRAND TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**139**	**0**	**117**	**0**	**256**	**1**	**256**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Peterborough Rd 28 & Moore Dr
Site Code: 2110200001
Municipality: Kawartha Downs
Count Date: Jul 07, 2021

North Approach - Peterborough Rd 28

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	
07:00	0	55	2	0	57	0	2	0	0	2	0	1	0	0	1	0
07:15	0	88	3	0	91	0	13	1	0	14	0	0	0	0	0	0
07:30	0	115	0	0	115	0	8	0	0	8	0	0	0	0	0	0
07:45	0	54	3	0	57	0	7	0	0	7	0	0	0	0	0	0
08:00	0	49	2	0	51	0	10	1	0	11	0	0	0	0	0	0
08:15	0	69	1	0	70	0	9	1	0	10	0	0	0	0	0	0
08:30	0	57	2	0	59	0	9	2	0	11	0	0	0	0	0	0
08:45	0	54	1	0	55	0	5	0	0	5	0	0	0	0	0	0
09:00	0	52	2	0	54	0	6	0	0	6	0	0	0	0	0	0
09:15	0	72	6	0	78	0	11	0	0	11	0	0	0	0	0	0
09:30	0	54	5	0	59	0	9	0	0	9	0	0	0	0	0	0
09:45	0	50	2	0	52	0	7	1	0	8	0	0	0	0	0	0
10:00	0	65	1	0	66	0	1	0	0	1	0	0	0	0	0	0
10:15	0	52	2	0	54	0	2	0	0	2	0	0	0	0	0	0
10:30	0	67	1	0	68	0	5	0	0	5	0	0	0	0	0	0
10:45	0	66	4	0	70	0	6	0	0	6	0	0	0	0	0	0
11:00	0	72	3	0	75	0	4	1	0	5	0	0	0	0	0	0
11:15	0	66	4	0	70	0	4	1	0	5	0	0	0	0	0	0
11:30	0	72	1	0	73	0	4	0	0	4	0	1	0	0	1	0
11:45	0	70	0	0	70	0	6	0	0	6	0	3	0	0	3	0

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	
12:00	0	67	1	0	68	0	7	0	0	7	0	0	0	0	0	0
12:15	0	85	2	0	87	0	5	0	0	5	0	0	0	0	0	0
12:30	0	129	3	0	132	0	9	2	0	11	0	0	0	0	0	0
12:45	0	67	4	0	71	0	5	0	0	5	0	0	0	0	0	0
13:00	0	73	1	0	74	0	6	0	0	6	0	0	0	0	0	0
13:15	0	71	2	0	73	0	7	0	0	7	0	0	0	0	0	0
13:30	0	52	2	0	54	0	4	0	0	4	0	0	0	0	0	0
13:45	0	64	1	0	65	0	5	0	0	5	0	0	0	0	0	0
14:00	0	59	2	0	61	0	1	0	0	1	0	0	0	0	0	0
14:15	0	61	1	0	62	0	3	0	0	3	0	0	0	0	0	0
14:30	0	59	2	0	61	0	5	0	0	5	0	0	0	0	0	0
14:45	0	79	3	0	82	0	3	0	0	3	0	0	0	0	0	0
15:00	0	77	2	0	79	0	5	0	0	5	0	1	0	0	1	0
15:15	0	95	1	0	96	0	4	0	0	4	0	0	0	0	0	0
15:30	0	76	4	0	80	0	6	0	0	6	0	0	0	0	0	0
15:45	0	99	1	0	100	0	5	0	0	5	0	0	0	0	0	0
16:00	0	104	3	0	107	0	6	0	0	6	0	0	0	0	0	0
16:15	0	139	12	0	151	0	5	0	0	5	0	0	0	0	0	0
16:30	0	67	3	0	70	0	6	0	0	6	0	0	0	0	0	0
16:45	0	87	3	0	90	0	3	0	0	3	0	0	0	0	0	0
17:00	0	84	1	0	85	0	7	0	0	7	0	0	0	0	0	0
17:15	0	73	1	0	74	0	6	0	0	6	0	0	0	0	0	0
17:30	0	69	1	0	70	0	3	0	0	3	0	0	0	0	0	0
17:45	0	63	0	0	63	0	1	0	0	1	0	0	0	0	0	0
SUBTOTAL	0	3198	101	0	3299	0	245	10	0	255	0	6	0	0	6	0
GRAND TOTAL	0	3198	101	0	3299	0	245	10	0	255	0	6	0	0	6	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Peterborough Rd 28 & Moore Dr
Site Code: 2110200001
Municipality: Kawartha Downs
Count Date: Jul 07, 2021

South Approach - Peterborough Rd 28

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	
07:00	2	59	0	0	61	0	9	0	0	9	0	0	0	0	0	0
07:15	2	75	0	0	77	5	15	0	0	20	0	0	0	0	0	0
07:30	0	146	0	0	146	1	12	0	0	13	0	0	0	0	0	0
07:45	4	96	0	0	100	0	6	0	0	6	0	0	0	0	0	0
08:00	2	52	0	0	54	1	7	0	0	8	0	0	0	0	0	0
08:15	0	79	0	0	79	1	9	0	0	10	0	0	0	0	0	0
08:30	1	70	0	0	71	0	12	0	0	12	0	0	0	0	0	0
08:45	2	77	0	0	79	0	6	0	0	6	0	0	0	0	0	0
09:00	0	71	0	0	71	1	7	0	0	8	0	0	0	0	0	0
09:15	2	64	0	0	66	0	8	0	0	8	0	0	0	0	0	0
09:30	1	72	0	0	73	0	6	0	0	6	0	0	0	0	0	0
09:45	0	41	0	0	41	0	7	0	0	7	0	0	0	0	0	0
10:00	0	65	0	0	65	0	2	0	0	2	0	0	0	0	0	0
10:15	0	55	0	0	55	0	1	0	0	1	0	0	0	0	0	0
10:30	0	78	0	0	78	0	2	0	0	2	0	0	0	0	0	0
10:45	0	69	0	0	69	0	1	0	0	1	0	0	0	0	0	0
11:00	1	54	0	0	55	0	4	0	0	4	0	0	0	0	0	0
11:15	1	100	0	0	101	0	6	0	0	6	0	1	0	0	1	0
11:30	0	95	0	0	95	0	5	0	0	5	0	0	0	0	0	0
11:45	1	90	0	0	91	0	5	0	0	5	0	0	0	0	0	0

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	
12:00	3	79	0	0	82	0	2	0	0	2	0	0	0	0	0	0
12:15	3	82	0	0	85	0	7	0	0	7	0	0	0	0	0	0
12:30	1	89	0	0	90	0	11	0	0	11	0	0	0	0	0	0
12:45	0	78	0	0	78	0	7	0	0	7	0	0	0	0	0	0
13:00	3	75	0	0	78	0	5	0	0	5	0	0	0	0	0	0
13:15	0	63	0	0	63	0	2	0	0	2	0	0	0	0	0	0
13:30	2	63	0	0	65	0	4	0	0	4	0	0	0	0	0	0
13:45	0	65	0	0	65	0	2	0	0	2	0	0	0	0	0	0
14:00	0	56	0	0	56	0	3	0	0	3	0	0	0	0	0	0
14:15	0	52	0	0	52	0	2	0	0	2	0	0	0	0	0	0
14:30	0	61	0	0	61	0	1	0	0	1	0	0	0	0	0	0
14:45	0	59	0	0	59	0	2	0	0	2	0	0	0	0	0	0
15:00	0	50	0	0	50	0	1	0	0	1	0	0	0	0	0	0
15:15	2	43	0	0	45	0	3	0	0	3	0	0	0	0	0	0
15:30	2	74	0	0	76	0	7	0	0	7	0	0	0	0	0	0
15:45	6	79	0	0	85	0	8	0	0	8	0	0	0	0	0	0
16:00	2	83	0	0	85	0	5	0	0	5	0	0	0	0	0	0
16:15	1	61	0	0	62	1	6	0	0	7	0	0	0	0	0	0
16:30	1	41	0	0	42	0	2	0	0	2	0	0	0	0	0	0
16:45	0	96	0	0	96	0	4	0	0	4	0	0	0	0	0	0
17:00	2	82	0	0	84	0	5	0	0	5	0	0	0	0	0	0
17:15	3	61	0	0	64	1	1	0	0	2	0	0	0	0	0	0
17:30	0	57	0	0	57	0	1	0	0	1	0	0	0	0	0	0
17:45	1	55	0	0	56	0	1	0	0	1	0	0	0	0	0	0
SUBTOTAL	51	3112	0	0	3163	11	222	0	0	233	0	1	0	0	1	0
GRAND TOTAL	**51**	**3112**	**0**	**0**	**3163**	**11**	**222**	**0**	**0**	**233**	**0**	**1**	**0**	**0**	**1**	**0**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Peterborough Rd 28 & Moore Dr
Site Code: 2110200001
Municipality: Kawartha Downs
Count Date: Jul 07, 2021

West Approach - Moore Dr

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
07:00	3	0	2	0	5	0	0	1	0	1	0	0	0	0	0	0
07:15	1	0	0	0	1	2	0	0	0	2	0	0	0	0	0	0
07:30	2	0	2	0	4	6	0	0	0	6	0	0	0	0	0	0
07:45	3	0	15	0	18	0	0	0	0	0	0	0	0	0	0	0
08:00	2	0	0	0	2	0	0	1	0	1	0	0	0	0	0	0
08:15	4	0	2	0	6	0	0	2	0	2	0	0	0	0	0	0
08:30	2	0	6	0	8	1	0	0	0	1	0	0	0	0	0	0
08:45	2	0	3	0	5	0	0	1	0	1	0	0	0	0	0	0
09:00	2	0	1	0	3	1	0	0	0	1	0	0	0	0	0	0
09:15	2	0	2	0	4	0	0	1	0	1	0	0	0	0	0	0
09:30	1	0	0	0	1	1	0	1	0	2	0	0	0	0	0	0
09:45	1	0	1	0	2	2	0	0	0	2	0	0	0	0	0	0
10:00	3	0	1	0	4	0	0	0	0	0	0	0	0	0	0	0
10:15	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0
10:30	2	0	2	0	4	0	0	0	0	0	0	0	0	0	0	0
10:45	1	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0
11:00	3	0	1	0	4	1	0	0	0	1	0	0	0	0	0	0
11:15	2	0	5	0	7	3	0	0	0	3	0	0	0	0	0	0
11:30	4	0	1	0	5	0	0	0	0	0	0	0	0	0	0	1
11:45	1	0	3	0	4	1	0	0	0	1	0	0	0	0	0	0

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	
12:00	4	0	6	0	10	2	0	0	0	2	0	0	0	0	0	0
12:15	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
12:30	1	0	0	0	1	2	0	2	0	4	0	0	0	0	0	0
12:45	1	0	2	0	3	1	0	1	0	2	0	0	0	0	0	0
13:00	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
13:15	4	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0
13:30	3	0	1	0	4	0	0	1	0	1	0	0	0	0	0	0
13:45	4	0	1	0	5	1	0	0	0	1	0	0	0	0	0	0
14:00	1	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0
14:15	1	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0
14:30	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0
14:45	2	0	1	0	3	1	0	0	0	1	0	0	0	0	0	0
15:00	3	0	3	0	6	0	0	0	0	0	0	0	0	0	0	0
15:15	2	0	2	0	4	0	0	0	0	0	0	0	0	0	0	0
15:30	7	0	5	0	12	0	0	0	0	0	0	0	0	0	0	0
15:45	1	0	6	0	7	0	0	0	0	0	0	0	0	0	0	0
16:00	6	0	6	0	12	0	0	0	0	0	0	0	0	0	0	0
16:15	3	0	5	0	8	0	0	0	0	0	0	0	0	0	0	0
16:30	3	0	2	0	5	0	0	0	0	0	0	0	0	0	0	0
16:45	3	0	4	0	7	0	0	3	0	3	0	0	0	0	0	0
17:00	11	0	1	0	12	0	0	0	0	0	0	0	0	0	0	0
17:15	5	0	1	0	6	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
17:45	1	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	113	0	103	0	216	26	0	14	0	40	0	0	0	0	0	1
GRAND TOTAL	113	0	103	0	216	26	0	14	0	40	0	0	0	0	0	1

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		One Hour Peak	
From:	07:00:00	From:	07:00:00
To:	10:00:00	To:	08:00:00

Intersection: Peterborough Rd 28 & Moore Dr
Site Code: 2110200001
Count Date: Jul 07, 2021

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Peterborough Rd 28 runs N/S

North Approach

	Out	In	Total
Cars	320	385	705
Trucks	31	50	81
Bicycles	1	0	1
	352	**435**	**787**

Peterborough Rd 28

Bicycles	0	1	0
Trucks	1	30	0
Cars	8	312	0
Totals	**9**	**343**	**0**

Peds: 0

Moore Dr

			Totals
0	0	0	**0**
0	8	9	**17**
0	1	19	**20**

Peds: 0

Peds: 0

Peds: 0

West Approach

	Out	In	Total
Cars	28	16	44
Trucks	9	7	16
Bicycles	0	0	0
	37	**23**	**60**

Totals	**14**	**418**	**0**
Cars	8	376	0
Trucks	6	42	0
Bicycles	0	0	0

Peterborough Rd 28

South Approach

	Out	In	Total
Cars	384	331	715
Trucks	48	31	79
Bicycles	0	1	1
	432	**363**	**795**

Cars - Trucks - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Summary

Intersection: Peterborough Rd 28 & Moore Dr
Site Code: 2110200001
Count Date: Jul 07, 2021
Period: 07:00 - 10:00

Peak Hour Data (07:00 - 08:00)

Start Time	North Approach Peterborough Rd 28						South Approach Peterborough Rd 28						East Approach						West Approach Moore Dr						Total Vehicles
					Peds	Total					Peds	Total					Peds	Total					Peds	Total	
07:00		58	2	0	0	60	2	68		0	0	70					0		3		3	0	0	6	136
07:15		101	4	0	0	105	7	90		0	0	97					0		3		0	0	0	3	205
07:30		123	0	0	0	123	1	158		0	0	159					0		8		2	0	0	10	292
07:45		61	3	0	0	64	4	102		0	0	106					0		3		15	0	0	18	188
Grand Total		**343**	**9**	**0**	**0**	**352**	**14**	**418**		**0**	**0**	**432**					**0**	**0**	**17**		**20**	**0**	**0**	**37**	**821**
Approach %		97.4	2.6	0		-	3.2	96.8		0		-						-	45.9		54.1	0		-	
Totals %		41.8	1.1	0		42.9	1.7	50.9		0		52.6						0	2.1		2.4	0		4.5	
PHF		**0.7**	**0.56**	**0**		**0.72**	**0.5**	**0.66**		**0**		**0.68**						**0**	**0.53**		**0.33**	**0**		**0.51**	**0.7**
Cars		312	8	0		320	8	376		0		384						0	9		19	0		28	732
% Cars		91	88.9	0		90.9	57.1	90		0		88.9						0	52.9		95	0		75.7	89.2
Trucks		30	1	0		31	6	42		0		48						0	8		1	0		9	88
% Trucks		8.7	11.1	0		8.8	42.9	10		0		11.1						0	47.1		5	0		24.3	10.7
Bicycles		1	0	0		1	0	0		0		0						0	0		0	0		0	1
% Bicycles		0.3	0	0		0.3	0	0		0		0						0	0		0	0		0	0.1
Peds					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		One Hour Peak	
From:	10:00:00	From:	11:45:00
To:	14:00:00	To:	12:45:00

Intersection: Peterborough Rd 28 & Moore Dr
Site Code: 2110200001
Count Date: Jul 07, 2021

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Peterborough Rd 28 runs N/S

North Approach

	Out	In	Total
Cars	357	346	703
Trucks	29	31	60
Bicycles	3	0	3
	389	**377**	**766**

Peterborough Rd 28

Bicycles	0	3	0
Trucks	2	27	0
Cars	6	351	0
Totals	**8**	**381**	**0**

Peds: 0

Moore Dr

			Totals
0	0	0	**0**
0	6	6	**12**
0	2	9	**11**

Peds: 0

Peds: 0

Peds: 0

West Approach

	Out	In	Total
Cars	15	14	29
Trucks	8	2	10
Bicycles	0	0	0
	23	**16**	**39**

Totals	**8**	**365**	**0**
Cars	8	340	0
Trucks	0	25	0
Bicycles	0	0	0

Peterborough Rd 28

South Approach

	Out	In	Total
Cars	348	360	708
Trucks	25	29	54
Bicycles	0	3	3
	373	**392**	**765**

Cars - Trucks - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Summary

Intersection: Peterborough Rd 28 & Moore Dr
Site Code: 2110200001
Count Date: Jul 07, 2021
Period: 10:00 - 14:00

Peak Hour Data (11:45 - 12:45)

Start Time	North Approach Peterborough Rd 28						South Approach Peterborough Rd 28						East Approach						West Approach Moore Dr						Total Vehicles
					Peds	Total					Peds	Total					Peds	Total					Peds	Total	
11:45		79	0	0	0	79	1	95		0	0	96					0		2		3	0	0	5	180
12:00		74	1	0	0	75	3	81		0	0	84					0		6		6	0	0	12	171
12:15		90	2	0	0	92	3	89		0	0	92					0		1		0	0	0	1	185
12:30		138	5	0	0	143	1	100		0	0	101					0		3		2	0	0	5	249
Grand Total		**381**	**8**	**0**	**0**	**389**	**8**	**365**		**0**	**0**	**373**					**0**	**0**	**12**		**11**	**0**	**0**	**23**	**785**
Approach %		97.9	2.1	0		-	2.1	97.9		0		-						-	52.2		47.8	0		-	
Totals %		48.5	1	0		49.6	1	46.5		0		47.5						0	1.5		1.4	0		2.9	
PHF		**0.69**	**0.4**	**0**		**0.68**	**0.67**	**0.91**		**0**		**0.92**						**0**	**0.5**		**0.46**	**0**		**0.48**	**0.79**
Cars		351	6	0		357	8	340		0		348						0	6		9	0		15	720
% Cars		92.1	75	0		91.8	100	93.2		0		93.3						0	50		81.8	0		65.2	91.7
Trucks		27	2	0		29	0	25		0		25						0	6		2	0		8	62
% Trucks		7.1	25	0		7.5	0	6.8		0		6.7						0	50		18.2	0		34.8	7.9
Bicycles		3	0	0		3	0	0		0		0						0	0		0	0		0	3
% Bicycles		0.8	0	0		0.8	0	0		0		0						0	0		0	0		0	0.4
Peds					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	

Peak Hour Diagram

Specified Period
From: 14:00:00
To: 18:00:00

One Hour Peak
From: 15:30:00
To: 16:30:00

Intersection: Peterborough Rd 28 & Moore Dr
Site Code: 2110200001
Count Date: Jul 07, 2021

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Peterborough Rd 28 runs N/S

North Approach

	Out	In	Total
Cars	438	314	752
Trucks	22	26	48
Bicycles	0	0	0
	460	**340**	**800**

Peterborough Rd 28

Bicycles	0	0	0
Trucks	0	22	0
Cars	20	418	0
Totals	**20**	**440**	**0**

Peds: 0

Moore Dr

Bicycles	Trucks	Cars	Totals	
0	0	0	**0**	
0	0	17	**17**	
0	0	22	**22**	

Peds: 0

Peds: 0

Peds: 0

West Approach

	Out	In	Total
Cars	39	31	70
Trucks	0	1	1
Bicycles	0	0	0
	39	**32**	**71**

Totals	**12**	**323**	**0**
Cars	11	297	0
Trucks	1	26	0
Bicycles	0	0	0

Peterborough Rd 28

South Approach

	Out	In	Total
Cars	308	440	748
Trucks	27	22	49
Bicycles	0	0	0
	335	**462**	**797**

Cars - Trucks - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Summary

Intersection: Peterborough Rd 28 & Moore Dr
Site Code: 2110200001
Count Date: Jul 07, 2021
Period: 14:00 - 18:00

Peak Hour Data (15:30 - 16:30)

Start Time	North Approach Peterborough Rd 28						South Approach Peterborough Rd 28						East Approach						West Approach Moore Dr						Total Vehicles
					Peds	Total					Peds	Total					Peds	Total					Peds	Total	
15:30		82	4	0	0	86	2	81		0	0	83					0		7		5	0	0	12	181
15:45		104	1	0	0	105	6	87		0	0	93					0		1		6	0	0	7	205
16:00		110	3	0	0	113	2	88		0	0	90					0		6		6	0	0	12	215
16:15		144	12	0	0	156	2	67		0	0	69					0		3		5	0	0	8	233
Grand Total		**440**	**20**	**0**	**0**	**460**	**12**	**323**		**0**	**0**	**335**					**0**	**0**	**17**		**22**	**0**	**0**	**39**	**834**
Approach %		95.7	4.3	0		-	3.6	96.4		0		-						-	43.6		56.4	0		-	
Totals %		52.8	2.4	0		55.2	1.4	38.7		0		40.2						0	2		2.6	0		4.7	
PHF		**0.76**	**0.42**	**0**		**0.74**	**0.5**	**0.92**		**0**		**0.9**						**0**	**0.61**		**0.92**	**0**		**0.81**	**0.89**
Cars		418	20	0		438	11	297		0		308						0	17		22	0		39	785
% Cars		95	100	0		95.2	91.7	92		0		91.9						0	100		100	0		100	94.1
Trucks		22	0	0		22	1	26		0		27						0	0		0	0		0	49
% Trucks		5	0	0		4.8	8.3	8		0		8.1						0	0		0	0		0	5.9
Bicycles		0	0	0		0	0	0		0		0						0	0		0	0		0	0
% Bicycles		0	0	0		0	0	0		0		0						0	0		0	0		0	0
Peds					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Project #21-102 - D.M. Wills Associates

Intersection Count Report

Intersection:	Peterborough Rd 28 & Syer Line
Municipality:	Kawartha Downs
Count Date:	Jul 07, 2021
Site Code:	2110200002
Count Categories:	Cars, Trucks, Bicycles, Pedestrians
Count Period:	07:00-18:00
Weather:	Clear

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Map

Intersection:	Peterborough Rd 28 & Syer Line
Site Code:	2110200002
Municipality:	Kawartha Downs
Count Date:	Jul 07, 2021

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Summary

Intersection: Peterborough Rd 28 & Syer Line
Site Code: 2110200002
Municipality: Kawartha Downs
Count Date: Jul 07, 2021

Peterborough Rd 28 - Traffic Summary

	North Approach Totals						South Approach Totals						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	Total
07:00 - 08:00	0	249	0	0	249	1	10	320	0	0	330	0	579
08:00 - 09:00	0	269	5	0	274	1	5	324	0	0	329	0	603
09:00 - 10:00	0	240	6	0	246	0	3	317	0	0	320	0	566
10:00 - 11:00	0	233	6	0	239	0	0	315	0	0	315	0	554
11:00 - 12:00	0	303	7	0	310	0	1	365	0	0	366	0	676
12:00 - 13:00	0	327	6	0	333	0	7	345	0	0	352	0	685
13:00 - 14:00	0	347	3	0	350	0	4	313	0	0	317	0	667
14:00 - 15:00	0	322	9	0	331	0	1	282	0	0	283	0	614
15:00 - 16:00	0	394	9	0	403	0	6	336	0	0	342	0	745
16:00 - 17:00	0	450	12	0	462	0	7	418	0	0	425	0	887
17:00 - 18:00	0	420	9	0	429	0	7	397	0	0	404	0	833
GRAND TOTAL	**0**	**3554**	**72**	**0**	**3626**	**2**	**51**	**3732**	**0**	**0**	**3783**	**0**	**7409**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Summary

Intersection: Peterborough Rd 28 & Syer Line
Site Code: 2110200002
Municipality: Kawartha Downs
Count Date: Jul 07, 2021

Syer Line - Traffic Summary

	East Approach Totals						West Approach Totals						
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
Hour	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	Total
07:00 - 08:00	0	0	0	0	0	0	8	0	2	0	10	0	10
08:00 - 09:00	0	0	0	0	0	0	9	0	11	0	20	0	20
09:00 - 10:00	0	0	0	0	0	0	3	0	7	0	10	0	10
10:00 - 11:00	0	0	0	0	0	0	5	0	4	0	9	0	9
11:00 - 12:00	0	0	0	0	0	0	14	0	6	0	20	0	20
12:00 - 13:00	0	0	0	0	0	0	8	0	5	0	13	0	13
13:00 - 14:00	0	0	0	0	0	0	8	0	12	0	20	1	20
14:00 - 15:00	0	0	0	0	0	0	6	0	2	0	8	0	8
15:00 - 16:00	0	0	0	0	0	0	10	0	8	0	18	0	18
16:00 - 17:00	0	0	0	0	0	0	7	0	2	0	9	0	9
17:00 - 18:00	0	0	0	0	0	0	12	0	8	0	20	0	20
GRAND TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**90**	**0**	**67**	**0**	**157**	**1**	**157**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Peterborough Rd 28 & Syer Line
Site Code: 2110200002
Municipality: Kawartha Downs
Count Date: Jul 07, 2021

North Approach - Peterborough Rd 28

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	
07:00	0	23	0	0	23	0	0	0	0	0	0	0	0	0	0	0
07:15	0	60	0	0	60	0	8	0	0	8	0	0	0	0	0	0
07:30	0	86	0	0	86	0	5	0	0	5	0	0	0	0	0	1
07:45	0	59	0	0	59	0	8	0	0	8	0	0	0	0	0	0
08:00	0	59	4	0	63	0	14	0	0	14	0	0	0	0	0	1
08:15	0	65	0	0	65	0	7	0	0	7	0	0	0	0	0	0
08:30	0	58	1	0	59	0	5	0	0	5	0	0	0	0	0	0
08:45	0	51	0	0	51	0	10	0	0	10	0	0	0	0	0	0
09:00	0	36	1	0	37	0	3	0	0	3	0	0	0	0	0	0
09:15	0	59	2	0	61	0	8	1	0	9	0	0	0	0	0	0
09:30	0	61	1	0	62	0	8	0	0	8	0	0	0	0	0	0
09:45	0	59	1	0	60	0	6	0	0	6	0	0	0	0	0	0
10:00	0	59	1	0	60	0	1	0	0	1	0	0	0	0	0	0
10:15	0	54	2	0	56	0	3	0	0	3	0	0	0	0	0	0
10:30	0	55	2	0	57	0	3	0	0	3	0	0	0	0	0	0
10:45	0	56	1	0	57	0	2	0	0	2	0	0	0	0	0	0
11:00	0	67	2	0	69	0	5	0	0	5	0	0	0	0	0	0
11:15	0	63	0	0	63	0	5	0	0	5	0	0	0	0	0	0
11:30	0	80	1	0	81	0	4	0	0	4	0	0	0	0	0	0
11:45	0	76	4	0	80	0	3	0	0	3	0	0	0	0	0	0

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	
12:00	0	73	0	0	73	0	8	0	0	8	0	0	0	0	0	0
12:15	0	76	4	0	80	0	5	0	0	5	0	0	0	0	0	0
12:30	0	77	2	0	79	0	6	0	0	6	0	0	0	0	0	0
12:45	0	77	0	0	77	0	5	0	0	5	0	0	0	0	0	0
13:00	0	65	0	0	65	0	3	0	0	3	0	0	0	0	0	0
13:15	0	75	1	0	76	0	8	0	0	8	0	0	0	0	0	0
13:30	0	99	1	0	100	0	5	0	0	5	0	0	0	0	0	0
13:45	0	87	1	0	88	0	5	0	0	5	0	0	0	0	0	0
14:00	0	76	3	0	79	0	2	0	0	2	0	0	0	0	0	0
14:15	0	77	2	0	79	0	1	0	0	1	0	0	0	0	0	0
14:30	0	86	2	0	88	0	1	0	0	1	0	0	0	0	0	0
14:45	0	78	2	0	80	0	1	0	0	1	0	0	0	0	0	0
15:00	0	101	1	0	102	0	5	1	0	6	0	0	0	0	0	0
15:15	0	96	3	0	99	0	4	0	0	4	0	0	0	0	0	0
15:30	0	87	1	0	88	0	6	1	0	7	0	0	0	0	0	0
15:45	0	90	2	0	92	0	5	0	0	5	0	0	0	0	0	0
16:00	0	114	4	0	118	0	7	0	0	7	0	0	0	0	0	0
16:15	0	96	3	0	99	0	9	0	0	9	0	0	0	0	0	0
16:30	0	109	0	0	109	0	5	0	0	5	0	0	0	0	0	0
16:45	0	105	5	0	110	0	5	0	0	5	0	0	0	0	0	0
17:00	0	127	1	0	128	0	7	0	0	7	0	0	0	0	0	0
17:15	0	102	3	0	105	0	7	0	0	7	0	0	0	0	0	0
17:30	0	89	2	0	91	0	5	0	0	5	0	0	0	0	0	0
17:45	0	79	3	0	82	0	4	0	0	4	0	0	0	0	0	0
SUBTOTAL	0	3327	69	0	3396	0	227	3	0	230	0	0	0	0	0	2
GRAND TOTAL	**0**	**3327**	**69**	**0**	**3396**	**0**	**227**	**3**	**0**	**230**	**0**	**0**	**0**	**0**	**0**	**2**

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Peterborough Rd 28 & Syer Line
Site Code: 2110200002
Municipality: Kawartha Downs
Count Date: Jul 07, 2021

South Approach - Peterborough Rd 28

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	↰	↑	↱	↻	Total	
07:00	6	29	0	0	35	0	10	0	0	10	0	0	0	0	0	0
07:15	1	61	0	0	62	0	6	0	0	6	0	0	0	0	0	0
07:30	0	102	0	0	102	0	9	0	0	9	0	0	0	0	0	0
07:45	3	97	0	0	100	0	6	0	0	6	0	0	0	0	0	0
08:00	0	58	0	0	58	1	9	0	0	10	0	0	0	0	0	0
08:15	1	84	0	0	85	0	14	0	0	14	0	0	0	0	0	0
08:30	1	73	0	0	74	1	9	0	0	10	0	0	0	0	0	0
08:45	1	74	0	0	75	0	3	0	0	3	0	0	0	0	0	0
09:00	3	46	0	0	49	0	5	0	0	5	0	0	0	0	0	0
09:15	0	65	0	0	65	0	11	0	0	11	0	0	0	0	0	0
09:30	0	94	0	0	94	0	7	0	0	7	0	0	0	0	0	0
09:45	0	81	0	0	81	0	8	0	0	8	0	0	0	0	0	0
10:00	0	76	0	0	76	0	1	0	0	1	0	0	0	0	0	0
10:15	0	77	0	0	77	0	2	0	0	2	0	0	0	0	0	0
10:30	0	67	0	0	67	0	2	0	0	2	0	0	0	0	0	0
10:45	0	87	0	0	87	0	3	0	0	3	0	0	0	0	0	0
11:00	0	78	0	0	78	0	4	0	0	4	0	0	0	0	0	0
11:15	1	101	0	0	102	0	5	0	0	5	0	0	0	0	0	0
11:30	0	86	0	0	86	0	5	0	0	5	0	0	0	0	0	0
11:45	0	82	0	0	82	0	4	0	0	4	0	0	0	0	0	0

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	
12:00	1	76	0	0	77	0	2	0	0	2	0	0	0	0	0	0
12:15	0	79	0	0	79	0	3	0	0	3	0	0	0	0	0	0
12:30	3	86	0	0	89	0	8	0	0	8	0	0	0	0	0	0
12:45	2	84	0	0	86	1	7	0	0	8	0	0	0	0	0	0
13:00	0	76	0	0	76	1	6	0	0	7	0	0	0	0	0	0
13:15	0	72	0	0	72	0	4	0	0	4	0	0	0	0	0	0
13:30	2	72	0	0	74	0	6	0	0	6	0	0	0	0	0	0
13:45	1	73	0	0	74	0	4	0	0	4	0	0	0	0	0	0
14:00	0	65	0	0	65	0	3	0	0	3	0	0	0	0	0	0
14:15	0	66	0	0	66	0	2	0	0	2	0	0	0	0	0	0
14:30	0	67	0	0	67	0	2	0	0	2	0	0	0	0	0	0
14:45	1	76	0	0	77	0	1	0	0	1	0	0	0	0	0	0
15:00	1	69	0	0	70	0	4	0	0	4	0	0	0	0	0	0
15:15	3	68	0	0	71	0	4	0	0	4	0	0	0	0	0	0
15:30	0	81	0	0	81	0	7	0	0	7	0	0	0	0	0	0
15:45	2	98	0	0	100	0	5	0	0	5	0	0	0	0	0	0
16:00	0	94	0	0	94	0	6	0	0	6	0	0	0	0	0	0
16:15	3	89	0	0	92	0	7	0	0	7	0	0	0	0	0	0
16:30	1	109	0	0	110	0	5	0	0	5	0	0	0	0	0	0
16:45	3	102	0	0	105	0	6	0	0	6	0	0	0	0	0	0
17:00	2	92	0	0	94	0	8	0	0	8	0	0	0	0	0	0
17:15	2	94	0	0	96	0	6	0	0	6	0	0	0	0	0	0
17:30	1	98	0	0	99	0	6	0	0	6	0	0	0	0	0	0
17:45	2	87	0	0	89	0	6	0	0	6	0	0	0	0	0	0
SUBTOTAL	47	3491	0	0	3538	4	241	0	0	245	0	0	0	0	0	0
GRAND TOTAL	47	3491	0	0	3538	4	241	0	0	245	0	0	0	0	0	0

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Traffic Count Data

Intersection: Peterborough Rd 28 & Syer Line
Site Code: 2110200002
Municipality: Kawartha Downs
Count Date: Jul 07, 2021

West Approach - Syer Line

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	
07:00	4	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0
07:15	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0
07:30	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
07:45	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0
08:00	4	0	4	0	8	0	0	0	0	0	0	0	0	0	0	0
08:15	2	0	3	0	5	0	0	0	0	0	0	0	1	0	1	0
08:30	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0
08:45	1	0	2	0	3	1	0	0	0	1	0	0	0	0	0	0
09:00	0	0	3	0	3	0	0	1	0	1	0	0	0	0	0	0
09:15	2	0	2	0	4	0	0	0	0	0	0	0	0	0	0	0
09:30	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
09:45	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
10:00	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
10:15	1	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0
10:30	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0
10:45	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0
11:00	4	0	2	0	6	0	0	1	0	1	0	0	0	0	0	0
11:15	5	0	2	0	7	0	0	0	0	0	0	0	0	0	0	0
11:30	4	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0
11:45	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0

Start Time	Cars					Trucks					Bicycles					Total Peds
	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	↰	↑	↱	↷	Total	
12:00	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0
12:15	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0
12:30	2	0	3	0	5	0	0	0	0	0	0	0	0	0	0	0
12:45	3	0	1	0	4	0	0	0	0	0	0	0	0	0	0	0
13:00	3	0	2	0	5	0	0	0	0	0	0	0	0	0	0	0
13:15	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	1
13:45	3	0	4	0	7	0	0	2	0	2	0	0	0	0	0	0
14:00	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0
14:15	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
14:30	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0
14:45	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
15:00	1	0	3	0	4	0	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
15:30	5	0	3	0	8	0	0	0	0	0	0	0	0	0	0	0
15:45	3	0	2	0	5	0	0	0	0	0	0	0	0	0	0	0
16:00	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
16:15	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0
16:30	4	0	1	0	5	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
17:00	2	0	4	0	6	0	0	0	0	0	0	0	0	0	0	0
17:15	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0
17:30	4	0	1	0	5	0	0	0	0	0	0	0	0	0	0	0
17:45	4	0	2	0	6	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	85	0	62	0	147	5	0	4	0	9	0	0	1	0	1	1
GRAND TOTAL	85	0	62	0	147	5	0	4	0	9	0	0	1	0	1	1

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		One Hour Peak	
From:	07:00:00	From:	07:30:00
To:	10:00:00	To:	08:30:00

Intersection: Peterborough Rd 28 & Syer Line
Site Code: 2110200002
Count Date: Jul 07, 2021

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Peterborough Rd 28 runs N/S

North Approach

	Out	In	Total
Cars	273	350	623
Trucks	34	38	72
Bicycles	0	0	0
	307	**388**	**695**

Peterborough Rd 28

Bicycles	0	0	0
Trucks	0	34	0
Cars	4	269	0
Totals	**4**	**303**	**0**

Peds: 2

Syer Line

Bicycles	Trucks	Cars	Totals
0	0	0	**0**
0	0	9	**9**
1	0	8	**9**

Peds: 0

Peds: 0

Peds: 0

West Approach

	Out	In	Total
Cars	17	8	25
Trucks	0	1	1
Bicycles	1	0	1
	18	**9**	**27**

Totals	**5**	**379**	**0**
Cars	4	341	0
Trucks	1	38	0
Bicycles	0	0	0

Peterborough Rd 28

South Approach

	Out	In	Total
Cars	345	277	622
Trucks	39	34	73
Bicycles	0	1	1
	384	**312**	**696**

Cars - Trucks - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Summary

Intersection: Peterborough Rd 28 & Syer Line
Site Code: 2110200002
Count Date: Jul 07, 2021
Period: 07:00 - 10:00

Peak Hour Data (07:30 - 08:30)

Start Time	North Approach Peterborough Rd 28						South Approach Peterborough Rd 28						East Approach						West Approach Syer Line						Total Vehicles
					Peds	Total					Peds	Total					Peds	Total					Peds	Total	
07:30		91	0	0	1	91	0	111		0	0	111					0		2		0	0	0	2	204
07:45		67	0	0	0	67	3	103		0	0	106					0		1		1	0	0	2	175
08:00		73	4	0	1	77	1	67		0	0	68					0		4		4	0	0	8	153
08:15		72	0	0	0	72	1	98		0	0	99					0		2		4	0	0	6	177
Grand Total		**303**	**4**	**0**	**2**	**307**	**5**	**379**		**0**	**0**	**384**					**0**	**0**	**9**		**9**	**0**	**0**	**18**	**709**
Approach %		98.7	1.3	0		-	1.3	98.7		0		-						-	50		50	0		-	
Totals %		42.7	0.6	0		43.3	0.7	53.5		0		54.2						0	1.3		1.3	0		2.5	
PHF		**0.83**	**0.25**	**0**		**0.84**	**0.42**	**0.85**		**0**		**0.86**						**0**	**0.56**		**0.56**	**0**		**0.56**	**0.87**
Cars		269	4	0		273	4	341		0		345						0	9		8	0		17	635
% Cars		88.8	100	0		88.9	80	90		0		89.8						0	100		88.9	0		94.4	89.6
Trucks		34	0	0		34	1	38		0		39						0	0		0	0		0	73
% Trucks		11.2	0	0		11.1	20	10		0		10.2						0	0		0	0		0	10.3
Bicycles		0	0	0		0	0	0		0		0						0	0		1	0		1	1
% Bicycles		0	0	0		0	0	0		0		0						0	0		11.1	0		5.6	0.1
Peds					2	-					0	-					0	-					0	-	2
% Peds					100	-					0	-					0	-					0	-	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		One Hour Peak	
From:	10:00:00	From:	12:00:00
To:	14:00:00	To:	13:00:00

Intersection: Peterborough Rd 28 & Syer Line
Site Code: 2110200002
Count Date: Jul 07, 2021

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Peterborough Rd 28 runs N/S

North Approach

	Out	In	Total
Cars	309	331	640
Trucks	24	22	46
Bicycles	0	0	0
	333	**353**	**686**

Peterborough Rd 28

Bicycles	0	0	0
Trucks	0	24	0
Cars	6	303	0
Totals	**6**	**327**	**0**

Peds: 0

Syer Line

			Totals
0	0	0	**0**
0	2	6	**8**
0	0	5	**5**

Peds: 0

Peds: 0

Peds: 0

West Approach

	Out	In	Total
Cars	11	12	23
Trucks	2	1	3
Bicycles	0	0	0
	13	**13**	**26**

Totals	**7**	**345**	**0**
Cars	6	325	0
Trucks	1	20	0
Bicycles	0	0	0

Peterborough Rd 28

South Approach

	Out	In	Total
Cars	331	308	639
Trucks	21	24	45
Bicycles	0	0	0
	352	**332**	**684**

Cars - Trucks - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Summary

Intersection: Peterborough Rd 28 & Syer Line
Site Code: 2110200002
Count Date: Jul 07, 2021
Period: 10:00 - 14:00

Peak Hour Data (12:00 - 13:00)

Start Time	North Approach Peterborough Rd 28						South Approach Peterborough Rd 28						East Approach						West Approach Syer Line						Total Vehicles
					Peds	Total					Peds	Total					Peds	Total					Peds	Total	
12:00		81	0	0	0	81	1	78		0	0	79					0		1		1	0	0	2	162
12:15		81	4	0	0	85	0	82		0	0	82					0		2		0	0	0	2	169
12:30		83	2	0	0	85	3	94		0	0	97					0		2		3	0	0	5	187
12:45		82	0	0	0	82	3	91		0	0	94					0		3		1	0	0	4	180
Grand Total		**327**	**6**	**0**	**0**	**333**	**7**	**345**		**0**	**0**	**352**					**0**	**0**	**8**		**5**	**0**	**0**	**13**	**698**
Approach %		98.2	1.8	0		-	2	98		0		-						-	61.5		38.5	0		-	
Totals %		46.8	0.9	0		47.7	1	49.4		0		50.4						0	1.1		0.7	0		1.9	
PHF		**0.98**	**0.38**	**0**		**0.98**	**0.58**	**0.92**		**0**		**0.91**						**0**	**0.67**		**0.42**	**0**		**0.65**	**0.93**
Cars		303	6	0		309	6	325		0		331						0	6		5	0		11	651
% Cars		92.7	100	0		92.8	85.7	94.2		0		94						0	75		100	0		84.6	93.3
Trucks		24	0	0		24	1	20		0		21						0	2		0	0		2	47
% Trucks		7.3	0	0		7.2	14.3	5.8		0		6						0	25		0	0		15.4	6.7
Bicycles		0	0	0		0	0	0		0		0						0	0		0	0		0	0
% Bicycles		0	0	0		0	0	0		0		0						0	0		0	0		0	0
Peds					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Diagram

Specified Period		One Hour Peak	
From:	14:00:00	From:	16:30:00
To:	18:00:00	To:	17:30:00

Intersection: Peterborough Rd 28 & Syer Line
Site Code: 2110200002
Count Date: Jul 07, 2021

Weather conditions: Clear

**** Unsignalized Intersection ****

Major Road: Peterborough Rd 28 runs N/S

North Approach

	Out	In	Total
Cars	452	405	857
Trucks	24	26	50
Bicycles	0	0	0
	476	**431**	**907**

Peterborough Rd 28

Bicycles	0	0	0
Trucks	0	24	0
Cars	9	443	0
Totals	**9**	**467**	**0**

Peds: 0

Syer Line

Bicycles	Trucks	Cars	Totals	
0	0	0	**0**	
0	1	8	**9**	
0	0	6	**6**	

Peds: 0

Peds: 0

Peds: 0

West Approach

	Out	In	Total
Cars	14	17	31
Trucks	1	0	1
Bicycles	0	0	0
	15	**17**	**32**

Totals	**8**	**422**	**0**
Cars	8	397	0
Trucks	0	25	0
Bicycles	0	0	0

Peterborough Rd 28

South Approach

	Out	In	Total
Cars	405	449	854
Trucks	25	24	49
Bicycles	0	0	0
	430	**473**	**903**

Cars - Trucks - Bicycles

Comments

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Peak Hour Summary

Intersection: Peterborough Rd 28 & Syer Line
Site Code: 2110200002
Count Date: Jul 07, 2021
Period: 14:00 - 18:00

Peak Hour Data (16:30 - 17:30)

Start Time	North Approach Peterborough Rd 28						South Approach Peterborough Rd 28						East Approach						West Approach Syer Line						Total Vehicles
					Peds	Total					Peds	Total					Peds	Total					Peds	Total	
16:30		114	0	0	0	114	1	114		0	0	115					0		4		1	0	0	5	234
16:45		110	5	0	0	115	3	108		0	0	111					0		1		0	0	0	1	227
17:00		134	1	0	0	135	2	100		0	0	102					0		2		4	0	0	6	243
17:15		109	3	0	0	112	2	100		0	0	102					0		2		1	0	0	3	217
Grand Total		**467**	**9**	**0**	**0**	**476**	**8**	**422**		**0**	**0**	**430**					**0**	**0**	**9**		**6**	**0**	**0**	**15**	**921**
Approach %		98.1	1.9	0		-	1.9	98.1		0		-						-	60		40	0		-	
Totals %		50.7	1	0		51.7	0.9	45.8		0		46.7						0	1		0.7	0		1.6	
PHF		**0.87**	**0.45**	**0**		**0.88**	**0.67**	**0.93**		**0**		**0.93**						**0**	**0.56**		**0.38**	**0**		**0.63**	**0.95**
Cars		443	9	0		452	8	397		0		405						0	8		6	0		14	871
% Cars		94.9	100	0		95	100	94.1		0		94.2						0	88.9		100	0		93.3	94.6
Trucks		24	0	0		24	0	25		0		25						0	1		0	0		1	50
% Trucks		5.1	0	0		5	0	5.9		0		5.8						0	11.1		0	0		6.7	5.4
Bicycles		0	0	0		0	0	0		0		0						0	0		0	0		0	0
% Bicycles		0	0	0		0	0	0		0		0						0	0		0	0		0	0
Peds					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	

Appendix D

Level of Service Criteria for Unsignalized Intersections

According to the HCM 2010, T-intersections with a stop sign on the stem of the T are considered Two-way Stop-Controlled intersections and have the same Level of Service (LOS) definitions and criteria as any Two-way Stop-Controlled intersection. For this type of intersections, the LOS is determined based on the control delay and is determined for each minor road lane group and the left-turn movement of the major road. The control delay, in this case, includes the delay due to deceleration to stop from the free-flow speed at the back of a queue (formed because of the stop sign), the move-up time within the queue, stopped delay at the front of the queue, and delay due to acceleration back to free-flow speed. The calculation of the control delay of a specific movement is a function of the flow rate and the capacity of this specific movement.

The description and criteria of the LOS at Two-way Stop-Controlled intersections are summarized in the table below.

LOS for Two-Way Stop-Controlled Intersections

Description of Conditions	Control Delay (sec/veh)	LOS by v/c Ratio	
		v/c ≤ 1.0	v/c > 1.0
No delay for stop-controlled approaches	0 - 10	A	F
Operations with minor delay	> 10 - 15	B	F
Operations with moderate delay	> 15 - 25	C	F
Operations with some delay	> 25 - 35	D	F
Operations with high delay	> 35 - 50	E	F
Operation with extreme congestion with very high delay	> 50	F	F

Appendix E

Synchro Reports for the
Background Traffic Conditions

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	17	20	14	418	343	9
Future Vol, veh/h	17	20	14	418	343	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	51	51	68	68	72	72
Heavy Vehicles, %	11	11	11	11	9	9
Mvmt Flow	33	39	21	615	476	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1140	483	489	0	-	0
Stage 1	483	-	-	-	-	-
Stage 2	657	-	-	-	-	-
Critical Hdwy	6.51	6.31	4.21	-	-	-
Critical Hdwy Stg 1	5.51	-	-	-	-	-
Critical Hdwy Stg 2	5.51	-	-	-	-	-
Follow-up Hdwy	3.599	3.399	2.299	-	-	-
Pot Cap-1 Maneuver	213	566	1029	-	-	-
Stage 1	602	-	-	-	-	-
Stage 2	499	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	206	566	1029	-	-	-
Mov Cap-2 Maneuver	206	-	-	-	-	-
Stage 1	583	-	-	-	-	-
Stage 2	499	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.9	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1029	-	314	-	-
HCM Lane V/C Ratio	0.02	-	0.231	-	-
HCM Control Delay (s)	8.6	0	19.9	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.9	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	9	5	379	303	4
Future Vol, veh/h	9	9	5	379	303	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	56	56	86	86	84	84
Heavy Vehicles, %	0	0	10	10	11	11
Mvmt Flow	16	16	6	441	361	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	817	364	366	0	-	0
Stage 1	364	-	-	-	-	-
Stage 2	453	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.2	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.29	-	-	-
Pot Cap-1 Maneuver	349	685	1150	-	-	-
Stage 1	707	-	-	-	-	-
Stage 2	645	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	347	685	1150	-	-	-
Mov Cap-2 Maneuver	347	-	-	-	-	-
Stage 1	702	-	-	-	-	-
Stage 2	645	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.4	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1150	-	461	-	-
HCM Lane V/C Ratio	0.005	-	0.07	-	-
HCM Control Delay (s)	8.1	0	13.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	7	613	2	5	354
Future Vol, veh/h	2	7	613	2	5	354
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	8	666	2	5	385

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1062	667	0	0	668	0
Stage 1	667	-	-	-	-	-
Stage 2	395	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	247	459	-	-	922	-
Stage 1	510	-	-	-	-	-
Stage 2	681	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	245	459	-	-	922	-
Mov Cap-2 Maneuver	245	-	-	-	-	-
Stage 1	510	-	-	-	-	-
Stage 2	676	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.6	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	384	922	-
HCM Lane V/C Ratio	-	-	0.025	0.006	-
HCM Control Delay (s)	-	-	14.6	8.9	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	18	46	379	11	27	277
Future Vol, veh/h	18	46	379	11	27	277
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	50	412	12	29	301

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	777	418	0	0	424	0
Stage 1	418	-	-	-	-	-
Stage 2	359	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	365	635	-	-	1135	-
Stage 1	664	-	-	-	-	-
Stage 2	707	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	354	635	-	-	1135	-
Mov Cap-2 Maneuver	354	-	-	-	-	-
Stage 1	664	-	-	-	-	-
Stage 2	685	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13	0	0.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	519	1135	-
HCM Lane V/C Ratio	-	-	0.134	0.026	-
HCM Control Delay (s)	-	-	13	8.3	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.1	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	19	22	15	462	379	10
Future Vol, veh/h	19	22	15	462	379	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	51	51	68	68	72	72
Heavy Vehicles, %	11	11	11	11	9	9
Mvmt Flow	37	43	22	679	526	14

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1256	533	540	0	-	0
Stage 1	533	-	-	-	-	-
Stage 2	723	-	-	-	-	-
Critical Hdwy	6.51	6.31	4.21	-	-	-
Critical Hdwy Stg 1	5.51	-	-	-	-	-
Critical Hdwy Stg 2	5.51	-	-	-	-	-
Follow-up Hdwy	3.599	3.399	2.299	-	-	-
Pot Cap-1 Maneuver	181	530	985	-	-	-
Stage 1	571	-	-	-	-	-
Stage 2	465	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	174	530	985	-	-	-
Mov Cap-2 Maneuver	174	-	-	-	-	-
Stage 1	550	-	-	-	-	-
Stage 2	465	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	23.7	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	985	-	272	-	-
HCM Lane V/C Ratio	0.022	-	0.296	-	-
HCM Control Delay (s)	8.7	0	23.7	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	1.2	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	10	6	418	335	4
Future Vol, veh/h	10	10	6	418	335	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	56	56	86	86	84	84
Heavy Vehicles, %	0	0	10	10	11	11
Mvmt Flow	18	18	7	486	399	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	902	402	404	0	-	0
Stage 1	402	-	-	-	-	-
Stage 2	500	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.2	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.29	-	-	-
Pot Cap-1 Maneuver	311	653	1113	-	-	-
Stage 1	680	-	-	-	-	-
Stage 2	613	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	308	653	1113	-	-	-
Mov Cap-2 Maneuver	308	-	-	-	-	-
Stage 1	674	-	-	-	-	-
Stage 2	613	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.4	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1113	-	419	-	-
HCM Lane V/C Ratio	0.006	-	0.085	-	-
HCM Control Delay (s)	8.3	0	14.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	8	677	2	6	391
Future Vol, veh/h	2	8	677	2	6	391
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	9	736	2	7	425

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1176	737	0	0	738	0
Stage 1	737	-	-	-	-	-
Stage 2	439	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	211	418	-	-	868	-
Stage 1	473	-	-	-	-	-
Stage 2	650	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	209	418	-	-	868	-
Mov Cap-2 Maneuver	209	-	-	-	-	-
Stage 1	473	-	-	-	-	-
Stage 2	643	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.7	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	348	868	-
HCM Lane V/C Ratio	-	-	0.031	0.008	-
HCM Control Delay (s)	-	-	15.7	9.2	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	19	50	419	11	30	306
Future Vol, veh/h	19	50	419	11	30	306
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	54	455	12	33	333

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	860	461	0	0	467	0
Stage 1	461	-	-	-	-	-
Stage 2	399	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	326	600	-	-	1094	-
Stage 1	635	-	-	-	-	-
Stage 2	678	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	314	600	-	-	1094	-
Mov Cap-2 Maneuver	314	-	-	-	-	-
Stage 1	635	-	-	-	-	-
Stage 2	653	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.9	0	0.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	480	1094	-
HCM Lane V/C Ratio	-	-	0.156	0.03	-
HCM Control Delay (s)	-	-	13.9	8.4	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0.1	-

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	21	24	17	510	418	11
Future Vol, veh/h	21	24	17	510	418	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	51	51	68	68	72	72
Heavy Vehicles, %	11	11	11	11	9	9
Mvmt Flow	41	47	25	750	581	15

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1389	589	596	0	-	0
Stage 1	589	-	-	-	-	-
Stage 2	800	-	-	-	-	-
Critical Hdwy	6.51	6.31	4.21	-	-	-
Critical Hdwy Stg 1	5.51	-	-	-	-	-
Critical Hdwy Stg 2	5.51	-	-	-	-	-
Follow-up Hdwy	3.599	3.399	2.299	-	-	-
Pot Cap-1 Maneuver	150	492	938	-	-	-
Stage 1	537	-	-	-	-	-
Stage 2	427	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	143	492	938	-	-	-
Mov Cap-2 Maneuver	143	-	-	-	-	-
Stage 1	512	-	-	-	-	-
Stage 2	427	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	30.1	0.3	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	938	-	230	-	-
HCM Lane V/C Ratio	0.027	-	0.384	-	-
HCM Control Delay (s)	8.9	0	30.1	-	-
HCM Lane LOS	A	A	D	-	-
HCM 95th %tile Q(veh)	0.1	-	1.7	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	11	6	462	369	5
Future Vol, veh/h	11	11	6	462	369	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	56	56	86	86	84	84
Heavy Vehicles, %	0	0	10	10	11	11
Mvmt Flow	20	20	7	537	439	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	993	442	445	0	-	0
Stage 1	442	-	-	-	-	-
Stage 2	551	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.2	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.29	-	-	-
Pot Cap-1 Maneuver	274	620	1074	-	-	-
Stage 1	652	-	-	-	-	-
Stage 2	581	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	272	620	1074	-	-	-
Mov Cap-2 Maneuver	272	-	-	-	-	-
Stage 1	646	-	-	-	-	-
Stage 2	581	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.6	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1074	-	378	-	-
HCM Lane V/C Ratio	0.006	-	0.104	-	-
HCM Control Delay (s)	8.4	0	15.6	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	9	748	3	6	432
Future Vol, veh/h	3	9	748	3	6	432
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	10	813	3	7	470

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1299	815	0	0	816	0
Stage 1	815	-	-	-	-	-
Stage 2	484	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	178	377	-	-	812	-
Stage 1	435	-	-	-	-	-
Stage 2	620	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	176	377	-	-	812	-
Mov Cap-2 Maneuver	176	-	-	-	-	-
Stage 1	435	-	-	-	-	-
Stage 2	613	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.9	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	293	812	-
HCM Lane V/C Ratio	-	-	0.045	0.008	-
HCM Control Delay (s)	-	-	17.9	9.5	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	1.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	21	54	463	11	32	338
Future Vol, veh/h	21	54	463	11	32	338
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	59	503	12	35	367

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	946	509	0	0	515	0
Stage 1	509	-	-	-	-	-
Stage 2	437	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	290	564	-	-	1051	-
Stage 1	604	-	-	-	-	-
Stage 2	651	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	278	564	-	-	1051	-
Mov Cap-2 Maneuver	278	-	-	-	-	-
Stage 1	604	-	-	-	-	-
Stage 2	624	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.1	0	0.7
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	438	1051	-
HCM Lane V/C Ratio	-	-	0.186	0.033	-
HCM Control Delay (s)	-	-	15.1	8.5	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0.1	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	17	22	12	323	440	20
Future Vol, veh/h	17	22	12	323	440	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	90	90	74	74
Heavy Vehicles, %	6	6	8	8	5	5
Mvmt Flow	21	27	13	359	595	27

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	994	609	622	0	-	0
Stage 1	609	-	-	-	-	-
Stage 2	385	-	-	-	-	-
Critical Hdwy	6.46	6.26	4.18	-	-	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-	-
Follow-up Hdwy	3.554	3.354	2.272	-	-	-
Pot Cap-1 Maneuver	267	488	930	-	-	-
Stage 1	535	-	-	-	-	-
Stage 2	679	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	262	488	930	-	-	-
Mov Cap-2 Maneuver	262	-	-	-	-	-
Stage 1	526	-	-	-	-	-
Stage 2	679	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.7	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	930	-	355	-	-
HCM Lane V/C Ratio	0.014	-	0.136	-	-
HCM Control Delay (s)	8.9	0	16.7	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	6	8	422	467	9
Future Vol, veh/h	9	6	8	422	467	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	63	63	93	93	88	88
Heavy Vehicles, %	7	7	6	6	5	5
Mvmt Flow	14	10	9	454	531	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1008	536	541	0	-	0
Stage 1	536	-	-	-	-	-
Stage 2	472	-	-	-	-	-
Critical Hdwy	6.47	6.27	4.16	-	-	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.363	2.254	-	-	-
Pot Cap-1 Maneuver	261	535	1008	-	-	-
Stage 1	577	-	-	-	-	-
Stage 2	617	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	258	535	1008	-	-	-
Mov Cap-2 Maneuver	258	-	-	-	-	-
Stage 1	570	-	-	-	-	-
Stage 2	617	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1008	-	325	-	-
HCM Lane V/C Ratio	0.009	-	0.073	-	-
HCM Control Delay (s)	8.6	0	17	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	2	493	0	5	583
Future Vol, veh/h	3	2	493	0	5	583
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	2	536	0	5	634

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1180	536	0	0	536	0
Stage 1	536	-	-	-	-	-
Stage 2	644	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	210	545	-	-	1032	-
Stage 1	587	-	-	-	-	-
Stage 2	523	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	209	545	-	-	1032	-
Mov Cap-2 Maneuver	209	-	-	-	-	-
Stage 1	587	-	-	-	-	-
Stage 2	519	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.3	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	277	1032	-
HCM Lane V/C Ratio	-	-	0.02	0.005	-
HCM Control Delay (s)	-	-	18.3	8.5	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	46	341	12	48	415
Future Vol, veh/h	14	46	341	12	48	415
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	50	371	13	52	451

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	933	378	0	0	384	0
Stage 1	378	-	-	-	-	-
Stage 2	555	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	295	669	-	-	1174	-
Stage 1	693	-	-	-	-	-
Stage 2	575	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	278	669	-	-	1174	-
Mov Cap-2 Maneuver	278	-	-	-	-	-
Stage 1	693	-	-	-	-	-
Stage 2	541	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.2	0	0.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	504	1174	-
HCM Lane V/C Ratio	-	-	0.129	0.044	-
HCM Control Delay (s)	-	-	13.2	8.2	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	19	24	13	357	486	22
Future Vol, veh/h	19	24	13	357	486	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	90	90	74	74
Heavy Vehicles, %	6	6	8	8	5	5
Mvmt Flow	23	30	14	397	657	30

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1097	672	687	0	-	0
Stage 1	672	-	-	-	-	-
Stage 2	425	-	-	-	-	-
Critical Hdwy	6.46	6.26	4.18	-	-	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-	-
Follow-up Hdwy	3.554	3.354	2.272	-	-	-
Pot Cap-1 Maneuver	232	449	879	-	-	-
Stage 1	500	-	-	-	-	-
Stage 2	651	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	227	449	879	-	-	-
Mov Cap-2 Maneuver	227	-	-	-	-	-
Stage 1	490	-	-	-	-	-
Stage 2	651	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.8	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	879	-	314	-	-
HCM Lane V/C Ratio	0.016	-	0.169	-	-
HCM Control Delay (s)	9.2	0	18.8	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	7	9	466	516	10
Future Vol, veh/h	10	7	9	466	516	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	63	63	93	93	88	88
Heavy Vehicles, %	7	7	6	6	5	5
Mvmt Flow	16	11	10	501	586	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1113	592	597	0	-	0
Stage 1	592	-	-	-	-	-
Stage 2	521	-	-	-	-	-
Critical Hdwy	6.47	6.27	4.16	-	-	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.363	2.254	-	-	-
Pot Cap-1 Maneuver	226	497	960	-	-	-
Stage 1	543	-	-	-	-	-
Stage 2	586	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	223	497	960	-	-	-
Mov Cap-2 Maneuver	223	-	-	-	-	-
Stage 1	535	-	-	-	-	-
Stage 2	586	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.8	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	960	-	288	-	-
HCM Lane V/C Ratio	0.01	-	0.094	-	-
HCM Control Delay (s)	8.8	0	18.8	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	2	545	0	6	643
Future Vol, veh/h	4	2	545	0	6	643
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	2	592	0	7	699

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1305	592	0	0	592	0
Stage 1	592	-	-	-	-	-
Stage 2	713	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	177	506	-	-	984	-
Stage 1	553	-	-	-	-	-
Stage 2	486	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	175	506	-	-	984	-
Mov Cap-2 Maneuver	175	-	-	-	-	-
Stage 1	553	-	-	-	-	-
Stage 2	480	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.6	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	224	984	-
HCM Lane V/C Ratio	-	-	0.029	0.007	-
HCM Control Delay (s)	-	-	21.6	8.7	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	50	376	13	52	458
Future Vol, veh/h	15	50	376	13	52	458
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	54	409	14	57	498

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1028	416	0	0	423	0
Stage 1	416	-	-	-	-	-
Stage 2	612	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	259	637	-	-	1136	-
Stage 1	666	-	-	-	-	-
Stage 2	541	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	241	637	-	-	1136	-
Mov Cap-2 Maneuver	241	-	-	-	-	-
Stage 1	666	-	-	-	-	-
Stage 2	504	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.2	0	0.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	462	1136	-
HCM Lane V/C Ratio	-	-	0.153	0.05	-
HCM Control Delay (s)	-	-	14.2	8.3	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.5	0.2	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	21	27	15	394	536	24
Future Vol, veh/h	21	27	15	394	536	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	90	90	74	74
Heavy Vehicles, %	6	6	8	8	5	5
Mvmt Flow	26	33	17	438	724	32

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1212	740	756	0	-	0
Stage 1	740	-	-	-	-	-
Stage 2	472	-	-	-	-	-
Critical Hdwy	6.46	6.26	4.18	-	-	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-	-
Follow-up Hdwy	3.554	3.354	2.272	-	-	-
Pot Cap-1 Maneuver	197	410	828	-	-	-
Stage 1	465	-	-	-	-	-
Stage 2	619	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	192	410	828	-	-	-
Mov Cap-2 Maneuver	192	-	-	-	-	-
Stage 1	452	-	-	-	-	-
Stage 2	619	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21.7	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	828	-	274	-	-
HCM Lane V/C Ratio	0.02	-	0.216	-	-
HCM Control Delay (s)	9.4	0	21.7	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.8	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	7	10	514	569	11
Future Vol, veh/h	11	7	10	514	569	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	63	63	93	93	88	88
Heavy Vehicles, %	7	7	6	6	5	5
Mvmt Flow	17	11	11	553	647	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1229	654	660	0	-	0
Stage 1	654	-	-	-	-	-
Stage 2	575	-	-	-	-	-
Critical Hdwy	6.47	6.27	4.16	-	-	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.363	2.254	-	-	-
Pot Cap-1 Maneuver	192	458	909	-	-	-
Stage 1	508	-	-	-	-	-
Stage 2	553	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	189	458	909	-	-	-
Mov Cap-2 Maneuver	189	-	-	-	-	-
Stage 1	499	-	-	-	-	-
Stage 2	553	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21.6	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	909	-	245	-	-
HCM Lane V/C Ratio	0.012	-	0.117	-	-
HCM Control Delay (s)	9	0	21.6	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	3	602	0	6	710
Future Vol, veh/h	4	3	602	0	6	710
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	3	654	0	7	772

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1440	654	0	0	654	0
Stage 1	654	-	-	-	-	-
Stage 2	786	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	146	467	-	-	933	-
Stage 1	517	-	-	-	-	-
Stage 2	449	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	144	467	-	-	933	-
Mov Cap-2 Maneuver	144	-	-	-	-	-
Stage 1	517	-	-	-	-	-
Stage 2	443	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	23.2	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	205	933	-
HCM Lane V/C Ratio	-	-	0.037	0.007	-
HCM Control Delay (s)	-	-	23.2	8.9	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	54	415	13	56	506
Future Vol, veh/h	15	54	415	13	56	506
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	59	451	14	61	550

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1130	458	0	0	465	0
Stage 1	458	-	-	-	-	-
Stage 2	672	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	225	603	-	-	1096	-
Stage 1	637	-	-	-	-	-
Stage 2	508	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	207	603	-	-	1096	-
Mov Cap-2 Maneuver	207	-	-	-	-	-
Stage 1	637	-	-	-	-	-
Stage 2	467	-	-	-	-	-

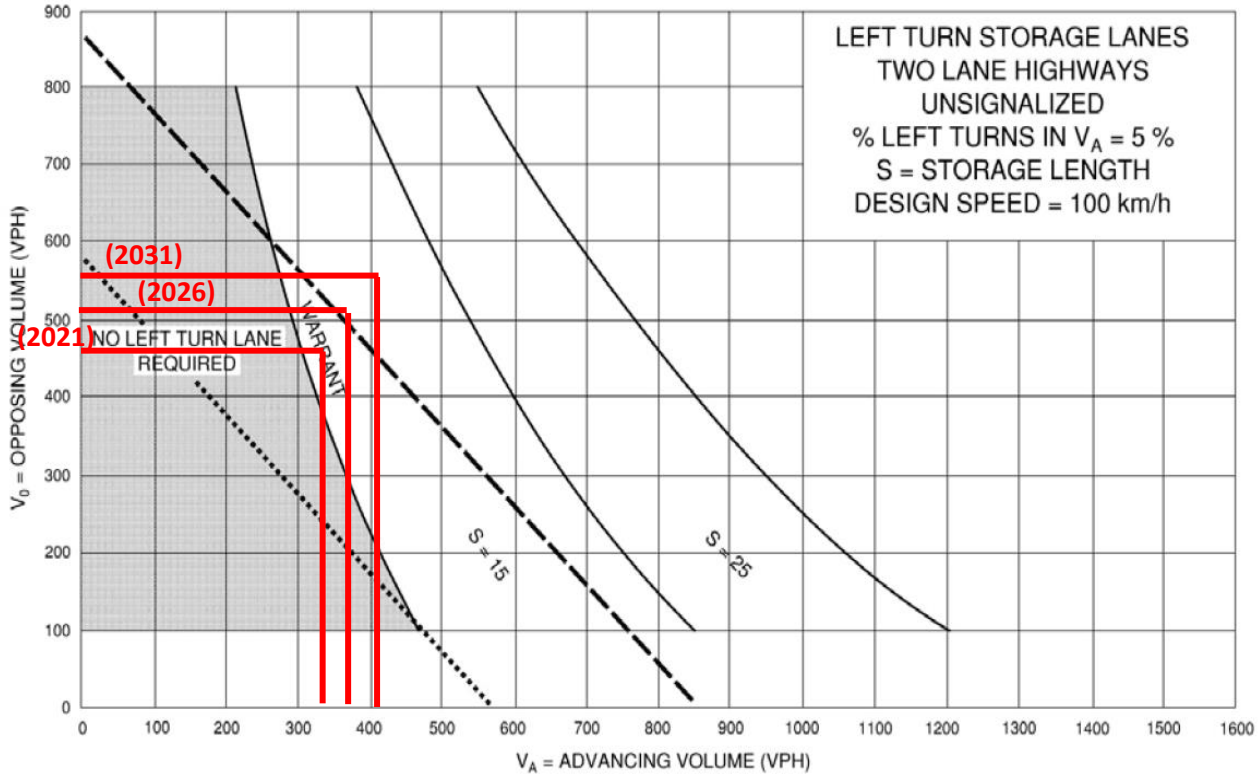
Approach	WB	NB	SB
HCM Control Delay, s	15.2	0	0.8
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	426	1096	-
HCM Lane V/C Ratio	-	-	0.176	0.056	-
HCM Control Delay (s)	-	-	15.2	8.5	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0.2	-

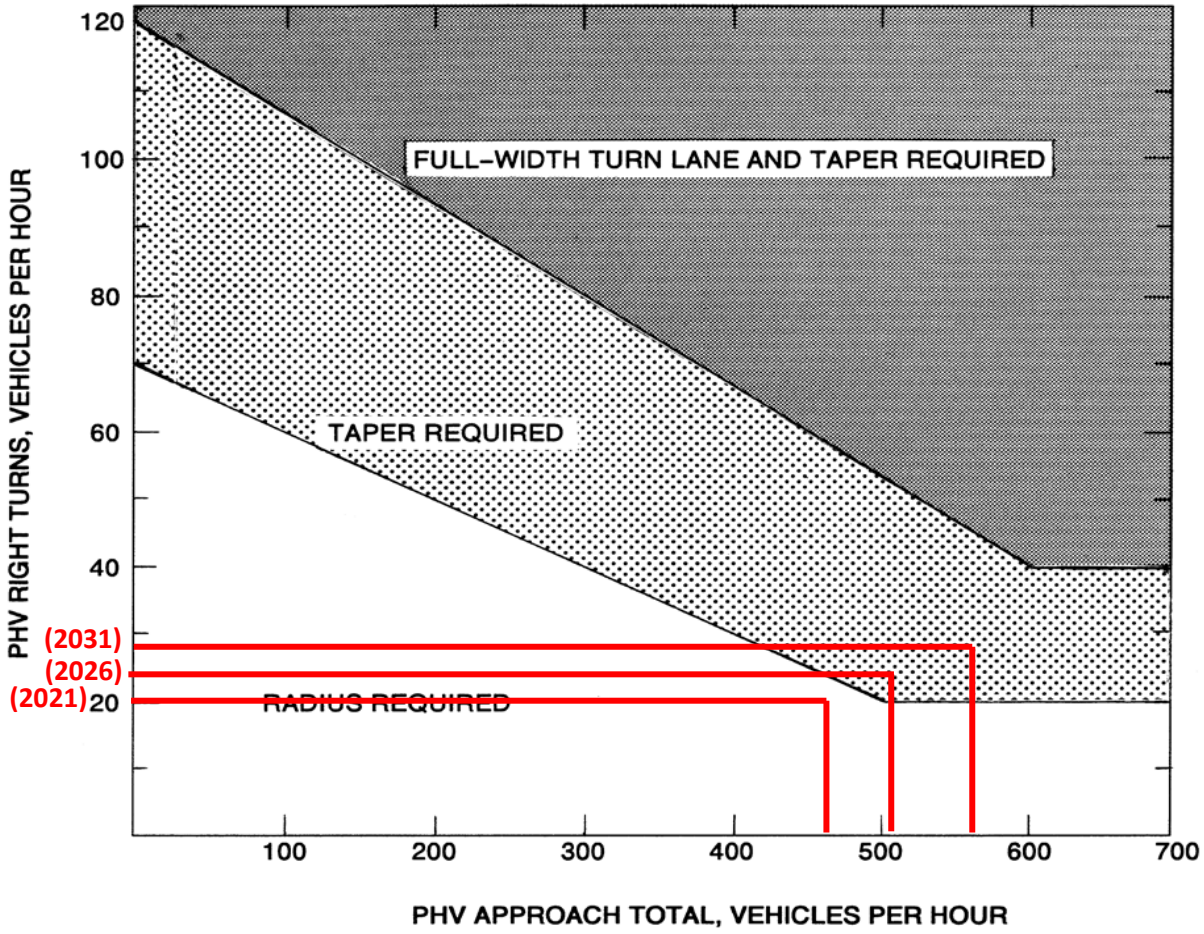
Appendix F

Auxiliary Lanes Analysis

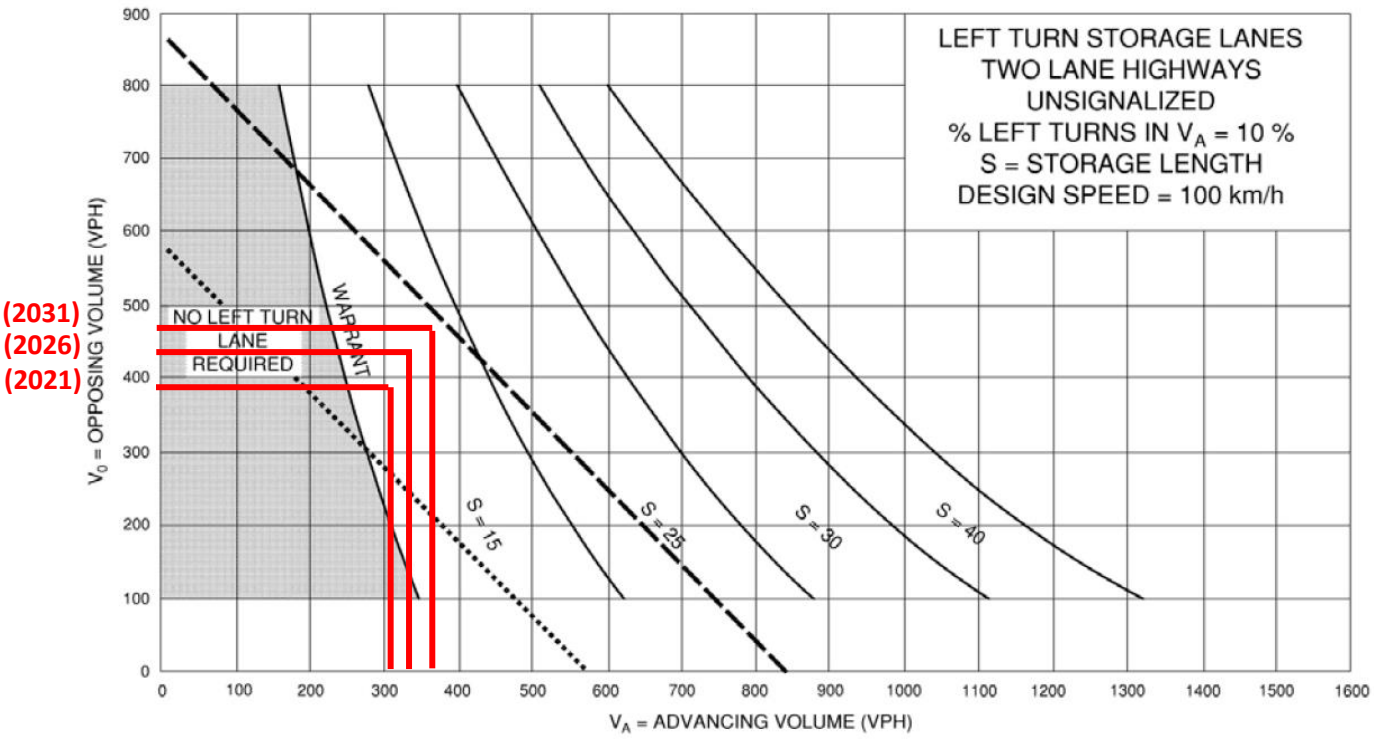
Left Turn Lane Warrant for the Existing PM Peak Hour at CR 28 and Moore Drive Intersection



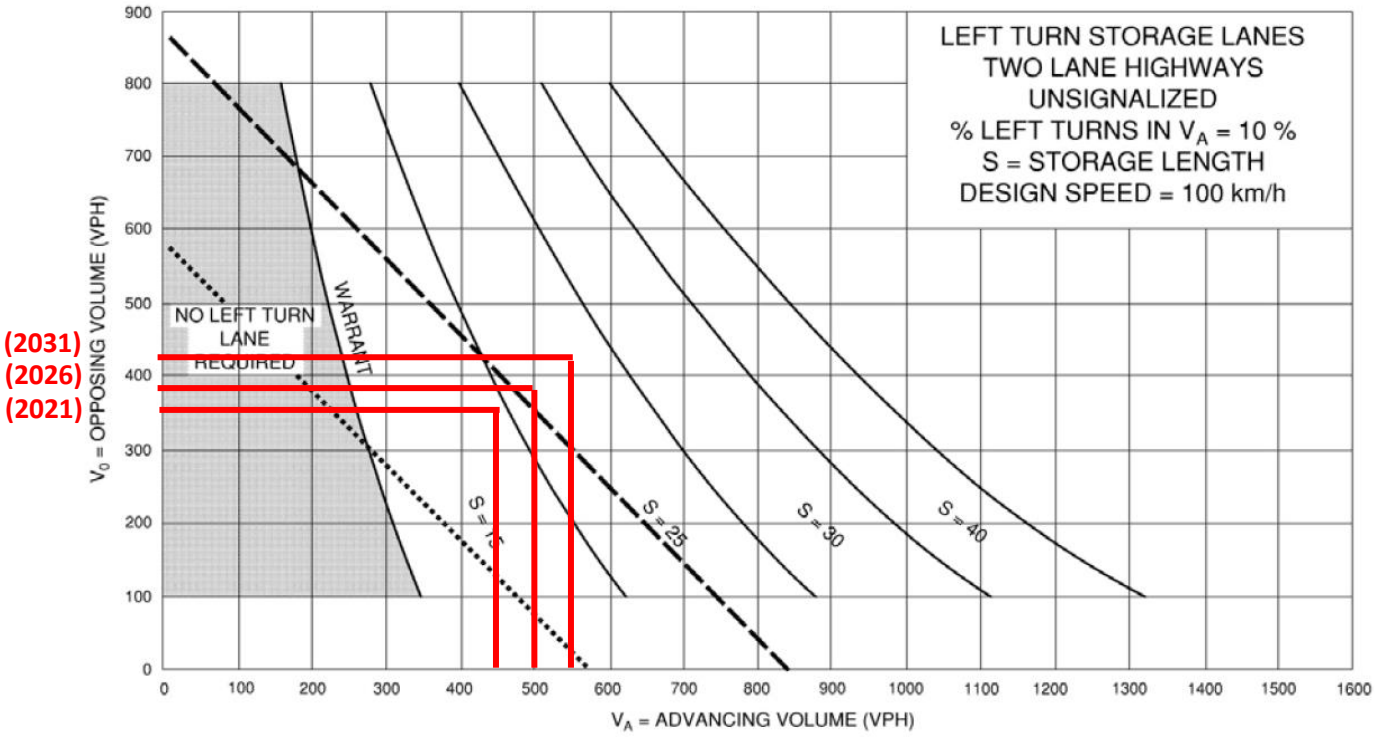
Right Turn Lane Warrant for the Existing PM Peak Hour at CR 28 and Moore Drive Intersection



Left Turn Lane Warrant for the Existing AM Peak Hour at CR 28 and Whitfield Road Intersection



Left Turn Lane Warrant for the Existing PM Peak Hour at CR 28 and Whitfield Road Intersection



Appendix G

Synchro Reports for the Traffic Conditions with the Development

Intersection	
Int Delay, s/veh	233.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	147	127	56	449	378	42
Future Vol, veh/h	147	127	56	449	378	42
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	51	51	68	68	72	72
Heavy Vehicles, %	11	11	11	11	9	9
Mvmt Flow	288	249	82	660	525	58

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1378	554	583	0	-	0
Stage 1	554	-	-	-	-	-
Stage 2	824	-	-	-	-	-
Critical Hdwy	6.51	6.31	4.21	-	-	-
Critical Hdwy Stg 1	5.51	-	-	-	-	-
Critical Hdwy Stg 2	5.51	-	-	-	-	-
Follow-up Hdwy	3.599	3.399	2.299	-	-	-
Pot Cap-1 Maneuver	~ 152	515	948	-	-	-
Stage 1	558	-	-	-	-	-
Stage 2	416	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 131	515	948	-	-	-
Mov Cap-2 Maneuver	~ 131	-	-	-	-	-
Stage 1	482	-	-	-	-	-
Stage 2	416	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 809.5	1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	948	-	200	-	-
HCM Lane V/C Ratio	0.087	-	2.686	-	-
HCM Control Delay (s)	9.2	0	$ 809.5	-	-
HCM Lane LOS	A	A	F	-	-
HCM 95th %tile Q(veh)	0.3	-	46.5	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	9	5	463	437	4
Future Vol, veh/h	9	9	5	463	437	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	56	56	86	86	84	84
Heavy Vehicles, %	0	0	10	10	11	11
Mvmt Flow	16	16	6	538	520	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1073	523	525	0	-	0
Stage 1	523	-	-	-	-	-
Stage 2	550	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.2	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.29	-	-	-
Pot Cap-1 Maneuver	246	558	1002	-	-	-
Stage 1	599	-	-	-	-	-
Stage 2	582	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	244	558	1002	-	-	-
Mov Cap-2 Maneuver	244	-	-	-	-	-
Stage 1	594	-	-	-	-	-
Stage 2	582	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.7	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1002	-	340	-	-
HCM Lane V/C Ratio	0.006	-	0.095	-	-
HCM Control Delay (s)	8.6	0	16.7	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	7	687	2	5	497
Future Vol, veh/h	2	7	687	2	5	497
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	8	747	2	5	540

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1298	748	0	0	749	0
Stage 1	748	-	-	-	-	-
Stage 2	550	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	178	412	-	-	860	-
Stage 1	468	-	-	-	-	-
Stage 2	578	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	177	412	-	-	860	-
Mov Cap-2 Maneuver	177	-	-	-	-	-
Stage 1	468	-	-	-	-	-
Stage 2	573	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.7	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	318	860	-
HCM Lane V/C Ratio	-	-	0.031	0.006	-
HCM Control Delay (s)	-	-	16.7	9.2	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	1.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	18	55	455	11	39	399
Future Vol, veh/h	18	55	455	11	39	399
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	60	495	12	42	434

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1019	501	0	0	507	0
Stage 1	501	-	-	-	-	-
Stage 2	518	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	263	570	-	-	1058	-
Stage 1	609	-	-	-	-	-
Stage 2	598	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	249	570	-	-	1058	-
Mov Cap-2 Maneuver	249	-	-	-	-	-
Stage 1	609	-	-	-	-	-
Stage 2	567	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.2	0	0.8
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	433	1058	-
HCM Lane V/C Ratio	-	-	0.183	0.04	-
HCM Control Delay (s)	-	-	15.2	8.5	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0.1	-

Intersection	
Int Delay, s/veh	287.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	149	129	57	493	414	43
Future Vol, veh/h	149	129	57	493	414	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	51	51	68	68	72	72
Heavy Vehicles, %	11	11	11	11	9	9
Mvmt Flow	292	253	84	725	575	60

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1498	605	635	0	-	0
Stage 1	605	-	-	-	-	-
Stage 2	893	-	-	-	-	-
Critical Hdwy	6.51	6.31	4.21	-	-	-
Critical Hdwy Stg 1	5.51	-	-	-	-	-
Critical Hdwy Stg 2	5.51	-	-	-	-	-
Follow-up Hdwy	3.599	3.399	2.299	-	-	-
Pot Cap-1 Maneuver	~ 129	481	906	-	-	-
Stage 1	528	-	-	-	-	-
Stage 2	386	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 109	481	906	-	-	-
Mov Cap-2 Maneuver	~ 109	-	-	-	-	-
Stage 1	446	-	-	-	-	-
Stage 2	386	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 1049	1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	906	-	170	-	-
HCM Lane V/C Ratio	0.093	-	3.206	-	-
HCM Control Delay (s)	9.4	0	$ 1049	-	-
HCM Lane LOS	A	A	F	-	-
HCM 95th %tile Q(veh)	0.3	-	50.9	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	10	6	503	468	4
Future Vol, veh/h	10	10	6	503	468	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	56	56	86	86	84	84
Heavy Vehicles, %	0	0	10	10	11	11
Mvmt Flow	18	18	7	585	557	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1159	560	562	0	-	0
Stage 1	560	-	-	-	-	-
Stage 2	599	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.2	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.29	-	-	-
Pot Cap-1 Maneuver	218	532	971	-	-	-
Stage 1	576	-	-	-	-	-
Stage 2	553	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	216	532	971	-	-	-
Mov Cap-2 Maneuver	216	-	-	-	-	-
Stage 1	570	-	-	-	-	-
Stage 2	553	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.3	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	971	-	307	-	-
HCM Lane V/C Ratio	0.007	-	0.116	-	-
HCM Control Delay (s)	8.7	0	18.3	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	2	8	750	2	6	534
Future Vol, veh/h	2	8	750	2	6	534
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	9	815	2	7	580

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1410	816	0	0	817	0
Stage 1	816	-	-	-	-	-
Stage 2	594	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	153	377	-	-	811	-
Stage 1	435	-	-	-	-	-
Stage 2	552	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	151	377	-	-	811	-
Mov Cap-2 Maneuver	151	-	-	-	-	-
Stage 1	435	-	-	-	-	-
Stage 2	545	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.9	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	290	811	-
HCM Lane V/C Ratio	-	-	0.037	0.008	-
HCM Control Delay (s)	-	-	17.9	9.5	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	1.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	19	59	495	11	42	428
Future Vol, veh/h	19	59	495	11	42	428
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	64	538	12	46	465

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1101	544	0	0	550	0
Stage 1	544	-	-	-	-	-
Stage 2	557	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	235	539	-	-	1020	-
Stage 1	582	-	-	-	-	-
Stage 2	574	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	221	539	-	-	1020	-
Mov Cap-2 Maneuver	221	-	-	-	-	-
Stage 1	582	-	-	-	-	-
Stage 2	539	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.4	0	0.8
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	399	1020	-
HCM Lane V/C Ratio	-	-	0.212	0.045	-
HCM Control Delay (s)	-	-	16.4	8.7	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.8	0.1	-

Intersection	
Int Delay, s/veh	365.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	151	131	59	541	453	44
Future Vol, veh/h	151	131	59	541	453	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	51	51	68	68	72	72
Heavy Vehicles, %	11	11	11	11	9	9
Mvmt Flow	296	257	87	796	629	61

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1630	660	690	0	-	0
Stage 1	660	-	-	-	-	-
Stage 2	970	-	-	-	-	-
Critical Hdwy	6.51	6.31	4.21	-	-	-
Critical Hdwy Stg 1	5.51	-	-	-	-	-
Critical Hdwy Stg 2	5.51	-	-	-	-	-
Follow-up Hdwy	3.599	3.399	2.299	-	-	-
Pot Cap-1 Maneuver	~ 106	448	864	-	-	-
Stage 1	498	-	-	-	-	-
Stage 2	354	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 87	448	864	-	-	-
Mov Cap-2 Maneuver	~ 87	-	-	-	-	-
Stage 1	408	-	-	-	-	-
Stage 2	354	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, $	1404.7	0.9	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	864	-	139	-	-
HCM Lane V/C Ratio	0.1	-	3.978	-	-
HCM Control Delay (s)	9.6	$	1404.7	-	-
HCM Lane LOS	A	A	F	-	-
HCM 95th %tile Q(veh)	0.3	-	55.5	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	11	6	546	503	5
Future Vol, veh/h	11	11	6	546	503	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	56	56	86	86	84	84
Heavy Vehicles, %	0	0	10	10	11	11
Mvmt Flow	20	20	7	635	599	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1251	602	605	0	-	0
Stage 1	602	-	-	-	-	-
Stage 2	649	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.2	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.29	-	-	-
Pot Cap-1 Maneuver	192	503	935	-	-	-
Stage 1	551	-	-	-	-	-
Stage 2	524	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	190	503	935	-	-	-
Mov Cap-2 Maneuver	190	-	-	-	-	-
Stage 1	544	-	-	-	-	-
Stage 2	524	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.2	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	935	-	276	-	-
HCM Lane V/C Ratio	0.007	-	0.142	-	-
HCM Control Delay (s)	8.9	0	20.2	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	9	821	3	6	575
Future Vol, veh/h	3	9	821	3	6	575
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	10	892	3	7	625

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1533	894	0	0	895	0
Stage 1	894	-	-	-	-	-
Stage 2	639	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	128	340	-	-	758	-
Stage 1	399	-	-	-	-	-
Stage 2	526	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	126	340	-	-	758	-
Mov Cap-2 Maneuver	126	-	-	-	-	-
Stage 1	399	-	-	-	-	-
Stage 2	519	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.9	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	239	758	-
HCM Lane V/C Ratio	-	-	0.055	0.009	-
HCM Control Delay (s)	-	-	20.9	9.8	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	21	63	538	11	44	460
Future Vol, veh/h	21	63	538	11	44	460
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	68	585	12	48	500

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1187	591	0	0	597	0
Stage 1	591	-	-	-	-	-
Stage 2	596	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	208	507	-	-	980	-
Stage 1	553	-	-	-	-	-
Stage 2	550	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	194	507	-	-	980	-
Mov Cap-2 Maneuver	194	-	-	-	-	-
Stage 1	553	-	-	-	-	-
Stage 2	513	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.3	0	0.8
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	361	980	-
HCM Lane V/C Ratio	-	-	0.253	0.049	-
HCM Control Delay (s)	-	-	18.3	8.9	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1	0.2	-

Intersection	
Int Delay, s/veh	181.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	80	108	137	471	922	170
Future Vol, veh/h	80	108	137	471	922	170
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	90	90	74	74
Heavy Vehicles, %	6	6	8	8	5	5
Mvmt Flow	99	133	152	523	1246	230

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2188	1361	1476	0	-	0
Stage 1	1361	-	-	-	-	-
Stage 2	827	-	-	-	-	-
Critical Hdwy	6.46	6.26	4.18	-	-	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-	-
Follow-up Hdwy	3.554	3.354	2.272	-	-	-
Pot Cap-1 Maneuver	~ 49	178	439	-	-	-
Stage 1	234	-	-	-	-	-
Stage 2	423	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 25	178	439	-	-	-
Mov Cap-2 Maneuver	~ 25	-	-	-	-	-
Stage 1	120	-	-	-	-	-
Stage 2	423	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, $	1848.5	3.9	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	439	-	49	-	-
HCM Lane V/C Ratio	0.347	-	4.737	-	-
HCM Control Delay (s)	17.5	$	1848.5	-	-
HCM Lane LOS	C	A	F	-	-
HCM 95th %tile Q(veh)	1.5	-	26.2	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	6	8	892	766	9
Future Vol, veh/h	9	6	8	892	766	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	63	63	93	93	88	88
Heavy Vehicles, %	7	7	6	6	5	5
Mvmt Flow	14	10	9	959	870	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1852	875	880	0	-	0
Stage 1	875	-	-	-	-	-
Stage 2	977	-	-	-	-	-
Critical Hdwy	6.47	6.27	4.16	-	-	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.363	2.254	-	-	-
Pot Cap-1 Maneuver	79	341	751	-	-	-
Stage 1	400	-	-	-	-	-
Stage 2	357	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	77	341	751	-	-	-
Mov Cap-2 Maneuver	77	-	-	-	-	-
Stage 1	390	-	-	-	-	-
Stage 2	357	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	45.6	0.1	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	751	-	112	-	-
HCM Lane V/C Ratio	0.011	-	0.213	-	-
HCM Control Delay (s)	9.8	0	45.6	-	-
HCM Lane LOS	A	A	E	-	-
HCM 95th %tile Q(veh)	0	-	0.8	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	2	766	0	5	1159
Future Vol, veh/h	3	2	766	0	5	1159
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	2	833	0	5	1260

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2103	833	0	0	833	0
Stage 1	833	-	-	-	-	-
Stage 2	1270	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	57	369	-	-	800	-
Stage 1	427	-	-	-	-	-
Stage 2	264	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	56	369	-	-	800	-
Mov Cap-2 Maneuver	56	-	-	-	-	-
Stage 1	427	-	-	-	-	-
Stage 2	258	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	50.2	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	85	800	-
HCM Lane V/C Ratio	-	-	0.064	0.007	-
HCM Control Delay (s)	-	-	50.2	9.5	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	2.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	101	755	12	79	691
Future Vol, veh/h	14	101	755	12	79	691
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	110	821	13	86	751

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1751	828	0	0	834	0
Stage 1	828	-	-	-	-	-
Stage 2	923	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	94	371	-	-	799	-
Stage 1	429	-	-	-	-	-
Stage 2	387	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	77	371	-	-	799	-
Mov Cap-2 Maneuver	77	-	-	-	-	-
Stage 1	429	-	-	-	-	-
Stage 2	315	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	32.4	0	1
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	253	799	-
HCM Lane V/C Ratio	-	-	0.494	0.107	-
HCM Control Delay (s)	-	-	32.4	10	0
HCM Lane LOS	-	-	D	B	A
HCM 95th %tile Q(veh)	-	-	2.5	0.4	-

Intersection	
Int Delay, s/veh	245.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	82	110	138	505	968	172
Future Vol, veh/h	82	110	138	505	968	172
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	90	90	74	74
Heavy Vehicles, %	6	6	8	8	5	5
Mvmt Flow	101	136	153	561	1308	232

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2291	1424	1540	0	-	0
Stage 1	1424	-	-	-	-	-
Stage 2	867	-	-	-	-	-
Critical Hdwy	6.46	6.26	4.18	-	-	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-	-
Follow-up Hdwy	3.554	3.354	2.272	-	-	-
Pot Cap-1 Maneuver	~ 42	163	414	-	-	-
Stage 1	218	-	-	-	-	-
Stage 2	405	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 19	163	414	-	-	-
Mov Cap-2 Maneuver	~ 19	-	-	-	-	-
Stage 1	~ 101	-	-	-	-	-
Stage 2	405	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, $	2564.6	4	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	414	-	38	-	-
HCM Lane V/C Ratio	0.37	-	6.238	-	-
HCM Control Delay (s)	18.7	$	2564.6	-	-
HCM Lane LOS	C	A	F	-	-
HCM 95th %tile Q(veh)	1.7	-	28	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	7	9	936	814	10
Future Vol, veh/h	10	7	9	936	814	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	63	63	93	93	88	88
Heavy Vehicles, %	7	7	6	6	5	5
Mvmt Flow	16	11	10	1006	925	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1957	931	936	0	-	0
Stage 1	931	-	-	-	-	-
Stage 2	1026	-	-	-	-	-
Critical Hdwy	6.47	6.27	4.16	-	-	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.363	2.254	-	-	-
Pot Cap-1 Maneuver	68	317	716	-	-	-
Stage 1	376	-	-	-	-	-
Stage 2	338	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	66	317	716	-	-	-
Mov Cap-2 Maneuver	66	-	-	-	-	-
Stage 1	364	-	-	-	-	-
Stage 2	338	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	55.1	0.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	716	-	98	-	-
HCM Lane V/C Ratio	0.014	-	0.275	-	-
HCM Control Delay (s)	10.1	0	55.1	-	-
HCM Lane LOS	B	A	F	-	-
HCM 95th %tile Q(veh)	0	-	1	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	2	818	0	6	1220
Future Vol, veh/h	4	2	818	0	6	1220
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	2	889	0	7	1326

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2229	889	0	0	889	0
Stage 1	889	-	-	-	-	-
Stage 2	1340	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	47	342	-	-	762	-
Stage 1	402	-	-	-	-	-
Stage 2	244	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	45	342	-	-	762	-
Mov Cap-2 Maneuver	45	-	-	-	-	-
Stage 1	402	-	-	-	-	-
Stage 2	235	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	68.6	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	63	762	-
HCM Lane V/C Ratio	-	-	0.104	0.009	-
HCM Control Delay (s)	-	-	68.6	9.8	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	3.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	105	790	13	84	734
Future Vol, veh/h	15	105	790	13	84	734
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	114	859	14	91	798

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1846	866	0	0	873	0
Stage 1	866	-	-	-	-	-
Stage 2	980	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	82	353	-	-	773	-
Stage 1	412	-	-	-	-	-
Stage 2	364	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	65	353	-	-	773	-
Mov Cap-2 Maneuver	65	-	-	-	-	-
Stage 1	412	-	-	-	-	-
Stage 2	287	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	40.3	0	1.1
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	227	773	-
HCM Lane V/C Ratio	-	-	0.575	0.118	-
HCM Control Delay (s)	-	-	40.3	10.3	0
HCM Lane LOS	-	-	E	B	A
HCM 95th %tile Q(veh)	-	-	3.2	0.4	-

Intersection	
Int Delay, s/veh	335.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	84	113	139	542	1018	175
Future Vol, veh/h	84	113	139	542	1018	175
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	90	90	74	74
Heavy Vehicles, %	6	6	8	8	5	5
Mvmt Flow	104	140	154	602	1376	236

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2404	1494	1612	0	-	0
Stage 1	1494	-	-	-	-	-
Stage 2	910	-	-	-	-	-
Critical Hdwy	6.46	6.26	4.18	-	-	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-	-
Follow-up Hdwy	3.554	3.354	2.272	-	-	-
Pot Cap-1 Maneuver	~ 35	148	388	-	-	-
Stage 1	201	-	-	-	-	-
Stage 2	386	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 14	148	388	-	-	-
Mov Cap-2 Maneuver	~ 14	-	-	-	-	-
Stage 1	~ 81	-	-	-	-	-
Stage 2	386	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, $	3588.5	4.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	388	-	29	-	-
HCM Lane V/C Ratio	0.398	-	8.387	-	-
HCM Control Delay (s)	20.3	$	3588.5	-	-
HCM Lane LOS	C	A	F	-	-
HCM 95th %tile Q(veh)	1.9	-	29.8	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	7	10	985	868	11
Future Vol, veh/h	11	7	10	985	868	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	63	63	93	93	88	88
Heavy Vehicles, %	7	7	6	6	5	5
Mvmt Flow	17	11	11	1059	986	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2074	993	999	0	-	0
Stage 1	993	-	-	-	-	-
Stage 2	1081	-	-	-	-	-
Critical Hdwy	6.47	6.27	4.16	-	-	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.363	2.254	-	-	-
Pot Cap-1 Maneuver	57	291	677	-	-	-
Stage 1	351	-	-	-	-	-
Stage 2	318	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	55	291	677	-	-	-
Mov Cap-2 Maneuver	55	-	-	-	-	-
Stage 1	337	-	-	-	-	-
Stage 2	318	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	73.1	0.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	677	-	80	-	-
HCM Lane V/C Ratio	0.016	-	0.357	-	-
HCM Control Delay (s)	10.4	0	73.1	-	-
HCM Lane LOS	B	A	F	-	-
HCM 95th %tile Q(veh)	0	-	1.4	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	3	874	0	6	1287
Future Vol, veh/h	4	3	874	0	6	1287
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	3	950	0	7	1399

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	2363	950	0	0	950	0
Stage 1	950	-	-	-	-	-
Stage 2	1413	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	39	315	-	-	723	-
Stage 1	376	-	-	-	-	-
Stage 2	225	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	37	315	-	-	723	-
Mov Cap-2 Maneuver	37	-	-	-	-	-
Stage 1	376	-	-	-	-	-
Stage 2	215	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	73.5	0	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	60	723	-
HCM Lane V/C Ratio	-	-	0.127	0.009	-
HCM Control Delay (s)	-	-	73.5	10	0
HCM Lane LOS	-	-	F	B	A
HCM 95th %tile Q(veh)	-	-	0.4	0	-

Intersection	
Int Delay, s/veh	4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	15	110	830	13	88	782
Future Vol, veh/h	15	110	830	13	88	782
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	120	902	14	96	850

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1951	909	0	0	916	0
Stage 1	909	-	-	-	-	-
Stage 2	1042	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	71	333	-	-	745	-
Stage 1	393	-	-	-	-	-
Stage 2	340	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	54	333	-	-	745	-
Mov Cap-2 Maneuver	54	-	-	-	-	-
Stage 1	393	-	-	-	-	-
Stage 2	257	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	51	0	1.1
HCM LOS	F		

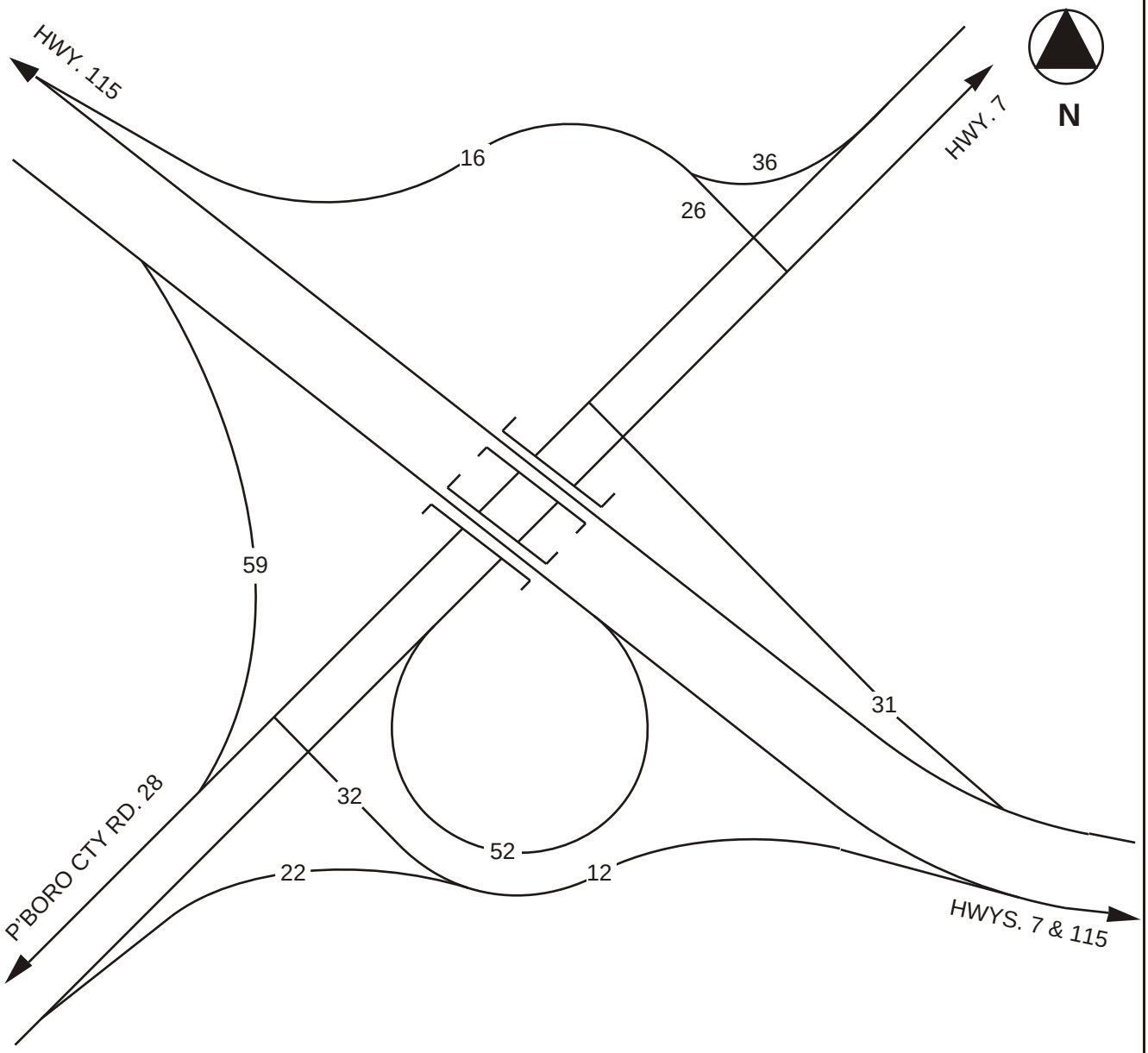
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	206	745	-
HCM Lane V/C Ratio	-	-	0.66	0.128	-
HCM Control Delay (s)	-	-	51	10.5	0
HCM Lane LOS	-	-	F	B	A
HCM 95th %tile Q(veh)	-	-	4	0.4	-

Appendix H

Traffic Data Acquired from the MTO

MINISTRY OF TRANSPORTATION
INTERCHANGE FILE

HWY.	**HWY. 7 IC**	**KEYPOINT NUMBER**	14247/000
AT	**E. JCT. 115 &**	**M.T.O. DISTRICT**	BANCROFT
	PETERBOROUGH CTY RD 28	**O.P.P. DISTRICT**	8 PETERBOROUGH



UPDATED 10 - 03 - 09 **PROGRAM DEVELOPMENT & EVALUATION OFFICE** 77 - 10 - 01

DATE

Ontario

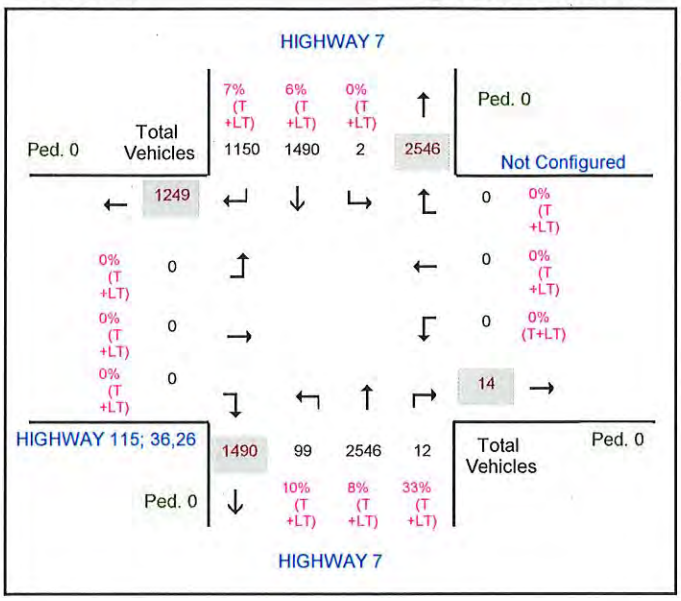
Ministry of Transportation

TVIS II - Traffic Volume Information System

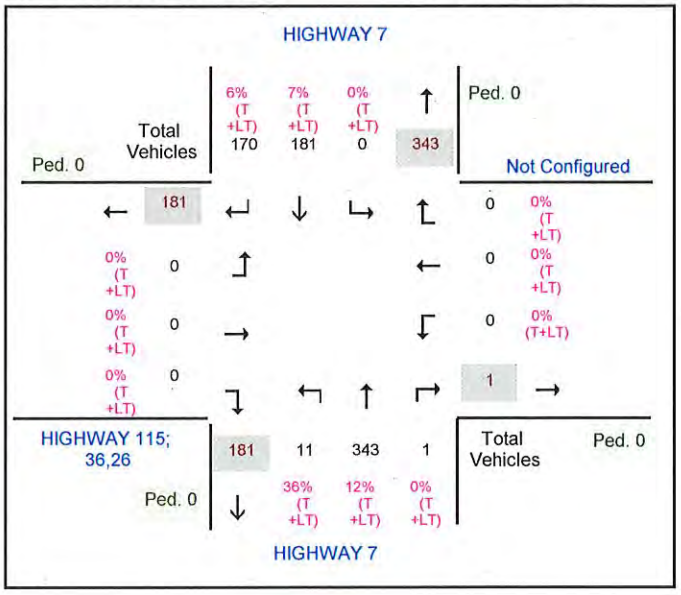
AdHoc Turning Movement Total Count and Peak Summary Report

Description: HWY 7 @ MTO YARD(E)
Region: EAST
Survey Type: TM – Interchange
Hwy: 7
Start Date: 28-Jun-2016 (Tue)
I/C Side: N
LHRS: 14247
End Date: 28-Jun-2016 (Tue)
Int. Type: T - W
Offset: 0.300
Schedule Summary: TUES-THURS, 07:00-09:00, 11:00-14:00, 15:00-18:00

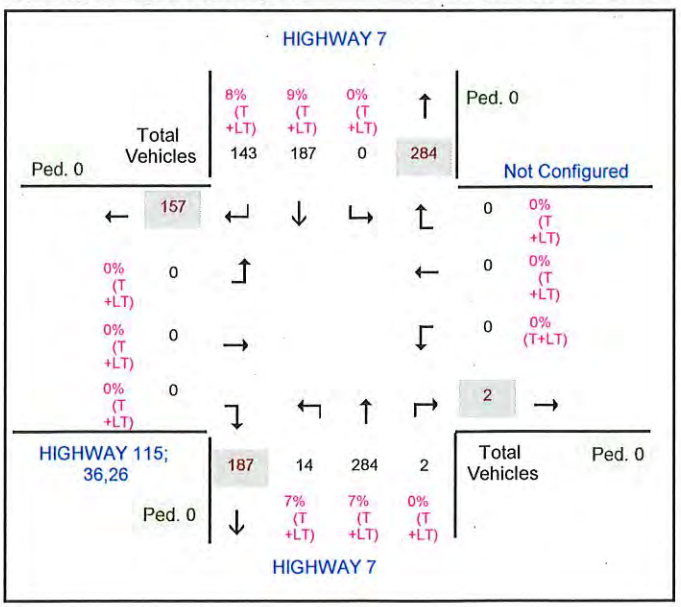
Total Count — Number of hours: 8



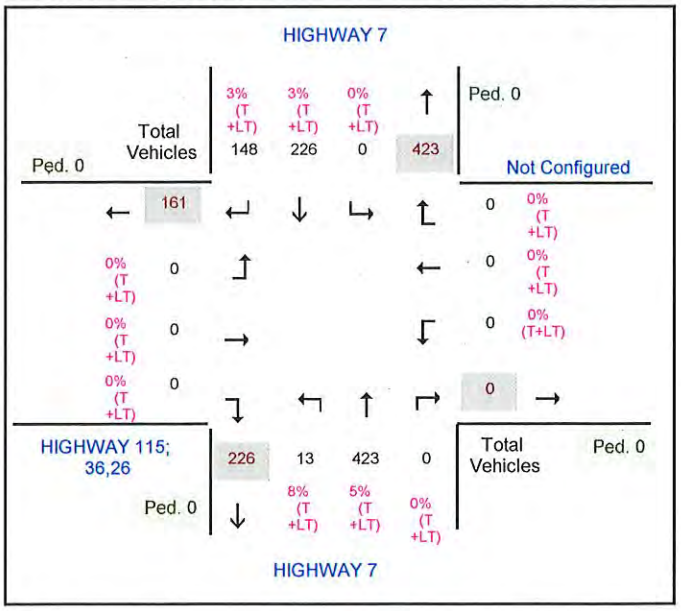
AM Peak Hour Report — Start Time: 07:30



Midday Peak Hour Report — Start Time: 12:30



PM Peak Hour Report — Start Time: 16:45



Ontario

Ministry of Transportation

TVIS II - Traffic Volume Information System

Turning Movement 15 Minute Report

Description: HWY 7 @ MTO YARD(E)

Region: EAST | Survey Type: TM – Interchange | Hwy: 7

Start Date: 28-Jun-2016 (Tue) | I/C Side: N | LHRS: 14247

End Date: 28-Jun-2016 (Tue) | Int. Type: T - W | Offset: 0.300

Schedule Summary: TUES-THURS, 07:00-09:00, 11:00-14:00, 15:00-18:00

	Major Road Approaches																				Minor Road Approaches																				
	North HIGHWAY 7										South HIGHWAY 7										West HIGHWAY 115: Ramp(s): 36,26										Not Configured										
Start	Cars			Trucks			Long Trucks				Cars			Trucks			Long Trucks				Cars			Trucks			Long Trucks				Cars			Trucks			Long Trucks				Total
Time	←	↑	→	←	↑	→	←	↑	→	Ped	←	↑	→	←	↑	→	←	↑	→	Ped	←	↑	→	←	↑	→	←	↑	→	Ped	←	↑	→	←	↑	→	←	↑	→	Ped	Veh.
Period 1																																									
07:00	0	33	31	0	0	1	0	0	0	0	3	44	0	0	1	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0											117
07:15	0	34	48	0	1	4	0	1	1	0	2	52	0	0	3	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0											148
07:30	0	39	40	0	2	0	0	0	1	0	2	79	1	0	3	0	1	6	0	0	0	0	0	0	0	0	0	0	0	0											174
07:45	0	42	40	0	3	1	0	0	0	0	3	82	0	0	5	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0											183
08:00	0	40	42	0	1	2	0	1	3	0	0	73	0	0	5	0	3	4	0	0	0	0	0	0	0	0	0	0	0	0											174
08:15	0	48	37	0	3	4	0	2	0	0	2	69	0	0	3	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0											175
08:30	0	38	47	0	2	3	0	1	2	0	0	70	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0											167
08:45	0	38	29	0	3	6	0	0	1	0	6	56	1	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0											146
Period 2																																									
11:00	0	48	25	0	1	4	0	2	2	0	1	62	0	0	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0											149
11:15	0	44	26	0	2	1	0	2	2	0	3	47	0	0	4	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0											134
11:30	0	44	37	0	2	0	0	1	1	0	3	64	1	2	3	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0											160
11:45	0	26	33	0	1	2	0	1	0	0	3	67	0	0	5	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0											143
12:00	0	38	30	0	2	0	0	0	0	0	0	72	0	0	2	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0											147
12:15	0	42	25	0	1	4	0	0	1	0	4	63	0	0	4	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0											148
12:30	0	40	24	0	4	1	0	4	2	0	2	67	1	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0											149
12:45	0	45	39	0	1	0	0	1	2	0	3	73	1	0	4	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0											172
13:00	0	30	30	0	2	4	0	0	0	0	1	56	0	0	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0											127
13:15	0	56	38	0	3	3	0	1	0	0	7	67	0	0	5	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0											182
13:30	0	48	27	0	2	1	0	1	1	0	2	55	0	0	8	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0											147
13:45	0	44	25	0	4	3	0	0	1	0	5	62	0	0	4	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0											150

Ontario

Ministry of Transportation

TVIS II - Traffic Volume Information System

Turning Movement 15 Minute Report

Description: **HWY 7 @ MTO YARD(E)**
Region: **EAST** Survey Type: **TM – Interchange** Hwy: **7**
Start Date: **28-Jun-2016 (Tue)** I/C Side: **N** LHRS: **14247**
End Date: **28-Jun-2016 (Tue)** Int. Type: **T - W** Offset: **0.300**
Schedule Summary: **TUES-THURS, 07:00-09:00, 11:00-14:00, 15:00-18:00**

	Major Road Approaches																		Minor Road Approaches																
	North HIGHWAY 7									South HIGHWAY 7									West HIGHWAY 115: Ramp(s): 36,26									Not Configured								
Start Time	Cars			Trucks			Long Trucks			Ped	Cars			Trucks			Long Trucks			Ped	Cars			Trucks			Long Trucks			Ped	Cars			Trucks			Long Trucks			Ped	Total Veh.
	←	↑	→	←	↑	→	←	↑	→		←	↑	→	←	↑	→	←	↑	→		←	↑	→	←	↑	→	←	↑	→		←	↑	→	←	↑	→	←	↑	→		
Period 3																																								
15:00	0	44	31	0	1	0	0	1	0	0	7	84	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0										171
15:15	0	54	32	0	4	1	0	1	2	0	1	88	1	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0										189
15:30	1	50	34	0	2	2	0	0	0	0	3	79	0	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0										175
15:45	0	35	27	0	0	1	0	0	1	0	2	85	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0										155
16:00	0	43	25	0	2	0	0	3	1	0	6	82	1	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0										167
16:15	1	43	42	0	1	0	0	0	1	0	4	107	0	0	5	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0										207
16:30	0	55	36	0	1	0	0	4	0	0	1	86	0	0	9	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0										194
16:45	0	54	29	0	1	1	0	1	0	0	4	95	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0										188
17:00	0	62	36	0	2	0	0	0	0	0	1	105	0	0	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0										211
17:15	0	56	40	0	2	2	0	0	0	0	5	99	0	0	1	0	1	5	0	0	0	0	0	0	0	0	0	0	0	0										211
17:30	0	48	38	0	0	0	0	0	2	0	2	103	0	0	5	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0										200
17:45	0	43	29	0	2	0	0	0	0	0	1	61	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0										139

Ontario

Ministry of Transportation

TVIS II - Traffic Volume information System

Ramp Weekly Volume Summary

Hwy: 7 Between: HWY 7 & S JCT HWY 115 IC

TS: 160 and: ~~STEWART LINE(W) P'BORO RD 15-N MONAGHAN PWY(E~~

Regn: Eastern Pattern: CTR PDCS: 09

LHRS: 14247 Offset: 0 Locn: HWY 7 & S JCT HWY 115 IC

Ramp: 12 Lanes: 1 Speed: Dates: 24-May-2016 to 31-May-2016

	Tue		Wed		Thu		Fri		Sat		Sun		Mon		Tue	
H. Interval	05/24		05/25	Pk.	05/26	Pk.	05/27	Pk.	05/28	Pk.	05/29	Pk.	05/30	Pk.	05/31	Pk.
00:00-01:00			28		38		18		51		52		22		30	
01:00-02:00			11		17		19		37		25		12		14	
02:00-03:00			13		26		13		17		27		16		19	
03:00-04:00			18		14		21		27		18		7		17	
04:00-05:00			23		28		38		22		11		24		30	
05:00-06:00			44		59		50		33		17		60		59	
06:00-07:00			214		194		203		71		44		204		201	
07:00-08:00			364		365		381		135		72		360		319	
08:00-09:00			475	◄	434	◄	423	◄	191	◄	117	◄	415	◄	475	◄
09:00-10:00			291		344		340		263		200		303		288	
10:00-11:00			340		298		339		310		252		283		279	
11:00-12:00			283		272		325		297	◄	269		301	◄	250	◄
AM Total			2104		2089		2170		1454		1104		2007		1981	
12:00-13:00	278	◄	289		281		334	◄	264		292	◄	278			
13:00-14:00	272		296	◄	283	◄	319		265		284		266			
14:00-15:00	277		296		315		323		273		264		277			
15:00-16:00	296		322		322		365		248		256	◄	293			
16:00-17:00	351	◄	342		341		383	◄	260	◄	177		355	◄		
17:00-18:00	335		346	◄	377	◄	346		219		171		300			
18:00-19:00	257		264		244		299		170		155		249			
19:00-20:00	156		191		180		204		147		137		161			
20:00-21:00	107		117		149		152		149		124		95			
21:00-22:00	91		120		115		115		176		104		93			
22:00-23:00	101		63		75		92		163		97		72			
23:00-00:00	50		59		41		75		85		36		51			
PM Total	2571		2705		2723		3007		2419		2097		2490			
24h. Total	2571		4809		4812		5177		3873		3201		4497		1981	

Noon - Noon	4675	4794	4893	4461	3523	4104	4471

ADT	AWD
4417	4708

Ontario

Ministry of Transportation

TVIS II - Traffic Volume information System

Ramp Weekly Volume Summary

Hwy: 7 Between: HWY 7 & S JCT HWY 115 IC

TS: 160 and: ~~STEWART LINE(W) P'BORO RD 15-N MONAGHAN PWY(E~~

Regn: Eastern Pattern: CTR PDCS: 09

LHRS: 14247 Offset: 0 Locn: HWY 7 & S JCT HWY 115 IC

Ramp: 31 Lanes: 1 Speed: Dates: 24-May-2016 to 31-May-2016

	Tue		Wed		Thu		Fri		Sat		Sun		Mon		Tue	
H. Interval	05/24		05/25	Pk.	05/26	Pk.	05/27	Pk.	05/28	Pk.	05/29	Pk.	05/30	Pk.	05/31	Pk.
00:00-01:00			21		28		27		41		52		19		27	
01:00-02:00			12		13		21		21		13		2		10	
02:00-03:00			12		20		12		20		8		10		16	
03:00-04:00			10		12		12		8		6		15		3	
04:00-05:00			20		22		25		22		10		22		16	
05:00-06:00			64		62		62		28		18		63		67	
06:00-07:00			172		173		189		63		31		155		145	
07:00-08:00			298	◄	247		266	◄	99		81		269	◄	267	◄
08:00-09:00			286		260	◄	230		137	◄	122	◄	251		242	
09:00-10:00			230		229		244		206		124		208		203	
10:00-11:00			232		253		255		190		162		226		209	
11:00-12:00			249		255		282		248		225		245		257	◄
AM Total			1606		1574		1625		1083		852		1485		1462	
12:00-13:00	307	◄	299	◄	274		344	◄	293	◄	294	◄	253			
13:00-14:00	290		270		300	◄	333		272		254		278	◄		
14:00-15:00	295		304		313		331		315		276		318			
15:00-16:00	408		362		385		398		281		302	◄	368			
16:00-17:00	414		434	◄	443	◄	430	◄	253		251		417	◄		
17:00-18:00	417	◄	432		432		392		299	◄	212		394			
18:00-19:00	212		209		249		280		295		185		212			
19:00-20:00	194		193		184		198		185		136		177			
20:00-21:00	155		179		174		178		134		122		140			
21:00-22:00	127		142		156		145		133		101		126			
22:00-23:00	80		72		51		119		84		63		74			
23:00-00:00	47		62		55		63		48		25		38			
PM Total	2946		2958		3016		3211		2592		2221		2795			
24h. Total	2946		4564		4590		4836		3675		3073		4280		1462	

Noon - Noon	4552	4532	4641	4294	3444	3706	4257

ADT	AWD
4204	4496

Ontario

Ministry of Transportation

TVIS II - Traffic Volume information System

Ramp Weekly Volume Summary

Hwy: 7 Between: HWY 7 & S JCT HWY 115 IC

TS: 160 and: ~~STEWART LINE(W) P'BORO RD 15-N MONAGHAN PWY(E~~

Regn: Eastern Pattern: CTR PDCS: 09

LHRS: 14247 Offset: 0 Locn: HWY 7 & S JCT HWY 115 IC

Ramp: 52 Lanes: 1 Speed: Dates: 24-May-2016 to 31-May-2016

	Tue		Wed		Thu		Fri		Sat		Sun		Mon		Tue	
H. Interval	05/24		05/25	Pk.	05/26	Pk.	05/27	Pk.	05/28	Pk.	05/29	Pk.	05/30	Pk.	05/31	Pk.
00:00-01:00			10		10		28		42		57		10		11	
01:00-02:00			12		18		11		28		31		12		7	
02:00-03:00			5		12		7		20		3		3		5	
03:00-04:00			15		8		10		8		6		1		10	
04:00-05:00			7		8		5		6		6		7		9	
05:00-06:00			29		26		23		9		8		17		40	
06:00-07:00			64		57		68		38		29		57		47	
07:00-08:00			109		126		112		55		46		104		126	
08:00-09:00			127	◄	128	◄	136	◄	97	◄	55	◄	107	◄	132	◄
09:00-10:00			91		98		107		154		65		96		94	
10:00-11:00			92		86		111		166		87		73		123	
11:00-12:00			102		95		168		191	◄	118	◄	72		101	◄
AM Total			**663**		**672**		**786**		**814**		**511**		**559**		**705**	
12:00-13:00	104	◄	92		111	◄	167		168		112		101	◄		
13:00-14:00	93		118	◄	109		175	◄	182		111		97			
14:00-15:00	104		136		122		210		184		99		101			
15:00-16:00	189		195		189		240		211	◄	120	◄	157			
16:00-17:00	209		223	◄	239	◄	301	◄	167		117		212			
17:00-18:00	213	◄	203		214		283		161		110		215	◄		
18:00-19:00	136		141		124		269		110		102		129			
19:00-20:00	92		90		113		197		108		101		85			
20:00-21:00	84		73		78		173		94		89		75			
21:00-22:00	63		58		100		147		52		59		65			
22:00-23:00	42		48		61		90		62		42		47			
23:00-00:00	37		49		48		74		41		22		39			
PM Total	**1366**		**1426**		**1508**		**2326**		**1540**		**1084**		**1323**			
24h. Total	**1366**		**2089**		**2180**		**3112**		**2354**		**1595**		**1882**		**705**	

Noon - Noon	2029	2098	2294	3140	2051	1643	2028

ADT	AWD
2183	2112

Ontario

Ministry of Transportation

TVIS II - Traffic Volume information System

Ramp Weekly Volume Summary

Hwy: 7 Between: HWY 7 & S JCT HWY 115 IC

TS: 160 and: STEWART LINE(W) P'BORO RD 15-N MONAGHAN PWY(E

Regn: Eastern Pattern: CTR PDCS: 09

LHRS: 14247 Offset: 0 Locn: HWY 7 & S JCT HWY 115 IC

Ramp: 16 Lanes: 1 Speed: Dates: 24-May-2016 to 31-May-2016

	Tue		Wed		Thu		Fri		Sat		Sun		Mon		Tue	
H. Interval	05/24		05/25	Pk.	05/26	Pk.	05/27	Pk.	05/28	Pk.	05/29	Pk.	05/30	Pk.	05/31	Pk.
00:00-01:00			8		12		16		19		33		10		10	
01:00-02:00			5		10		2		14		18		13		8	
02:00-03:00			17		10		15		16		15		7		10	
03:00-04:00			27		24		24		10		14		40		23	
04:00-05:00			71		67		50		18		9		75		92	
05:00-06:00			187		167		171		56		36		181		185	
06:00-07:00			198		181		158		67		43		209		204	
07:00-08:00			213	◄	185		193	◄	98		55		220	◄	208	◄
08:00-09:00			176		192	◄	177		156	◄	103	◄	195		181	
09:00-10:00			179		165		156		183		194		173		174	
10:00-11:00			208		152		156		205		207		156		189	
11:00-12:00			167	◄	155		137		166		220		169	◄	144	◄
AM Total			**1456**		**1320**		**1255**		**1008**		**947**		**1448**		**1428**	
12:00-13:00	187		145		162	◄	169		186		265		149			
13:00-14:00	197	◄	153		147		177	◄	188	◄	285	◄	169			
14:00-15:00	185		185		127		191		171		359		166			
15:00-16:00	195		156		199	◄	209	◄	210	◄	275		160			
16:00-17:00	184		182	◄	194		205		185		275		162			
17:00-18:00	209	◄	168		175		170		143		277	◄	205	◄		
18:00-19:00	151		135		150		139		118		261		114			
19:00-20:00	107		98		100		96		95		242		91			
20:00-21:00	85		72		98		90		136		183		81			
21:00-22:00	60		62		43		83		162		94		54			
22:00-23:00	51		39		45		48		190		58		30			
23:00-00:00	21		16		19		35		68		23		20			
PM Total	**1632**		**1411**		**1459**		**1612**		**1852**		**2597**		**1401**			
24h. Total	**1632**		**2867**		**2779**		**2867**		**2860**		**3544**		**2849**		**1428**	

Noon - Noon	3088	2731	2714	2620	2799	4045	2829

ADT	AWD
2975	2840

Ontario

Ministry of Transportation

TVIS II - Traffic Volume information System

Ramp Weekly Volume Summary

Hwy: 7 Between: HWY 7 & S JCT HWY 115 IC

TS: 160 and: ~~STEWART LINE(W) P'BORO RD 15 N MONAGHAN PWY(E~~

Regn: Eastern Pattern: CTR PDCS: 09

LHRS: 14247 Offset: 0 Locn: HWY 7 & S JCT HWY 115 IC

Ramp: 59 Lanes: 1 Speed: Dates: 24-May-2016 to 31-May-2016

	Tue		Wed		Thu		Fri		Sat		Sun		Mon		Tue	
H. Interval	05/24		05/25	Pk.	05/26	Pk.	05/27	Pk.	05/28	Pk.	05/29	Pk.	05/30	Pk.	05/31	Pk.
00:00-01:00			4		1		1		1		5		2		0	
01:00-02:00			0		0		1		3		3		0		0	
02:00-03:00			0		1		0		2		2		0		0	
03:00-04:00			1		1		0		1		1		1		2	
04:00-05:00			1		0		2		1		0		2		0	
05:00-06:00			2		3		4		2		3		1		4	
06:00-07:00			7		7		5		3		8		9		14	
07:00-08:00			16	◄	12	◄	13		8		13		10		15	◄
08:00-09:00			15		10		14	◄	11	◄	19	◄	11	◄	14	
09:00-10:00			18		20		16		21		19		27		10	
10:00-11:00			22		15		18		27		14		9		22	
11:00-12:00			27	◄	17	◄	23		25		24		21	◄	14	◄
AM Total			**113**		**87**		**97**		**105**		**111**		**93**		**95**	
12:00-13:00	22	◄	16		13		24	◄	30		27	◄	21			
13:00-14:00	19		13		17		21		33	◄	16		14			
14:00-15:00	16		21		15		30		30		24		15			
15:00-16:00	17		17		21		36	◄	29		20	◄	17			
16:00-17:00	23	◄	27	◄	27	◄	29		29		17		15			
17:00-18:00	13		25		25		23		34		13		20	◄		
18:00-19:00	11		16		25		26		64	◄	16		10			
19:00-20:00	9		14		17		24		24		8		7			
20:00-21:00	7		9		10		18		21		9		14			
21:00-22:00	6		7		10		15		10		10		6			
22:00-23:00	1		2		6		9		8		3		3			
23:00-00:00	8		1		5		2		9		6		7			
PM Total	**152**		**168**		**191**		**257**		**321**		**169**		**149**			
24h. Total	**152**		**281**		**278**		**354**		**426**		**280**		**242**		**95**	

Noon - Noon	265	255	288	362	432	262	244

ADT	AWD
301	263