Traffic Impact Study

Kawartha Downs Development, Township of Cavan Monaghan, County of Peterborough

D.M. Wills Project Number 85152

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WILLS

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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 on the traffic operation in the area. Kawartha Downs (the development) is located at 1490 County Road 28 & 1683 Moore Drive, Fraserville, Ontario. The land is to the south of Ontario Highway 115 and on the west side of Peterborough County Road 28 (CR 28).

As proposed in the draft conceptual plan, the proposed development include two components; residential and recreational developments. The residential development is proposed to include 123 single detached dwellings, 272 semidetached dwellings, and 193 townhouses. Most of these dwellings will have an access to Moore Drive and only 42 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 the intersections of CR 28 and Moore Drive and CR 28 and Syer Line. Also, the study area includes two entrances of the recreational component on CR 28 and an entrance to the 42 dwelling units residential component.

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.
  - It is known to our team that an extension of the existing left turn lane at Whitfield Road is needed based on the existing traffic at this intersection.
- **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.

- 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.

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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 1490 County Road 28 & 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. 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 and Syer Line. 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 component; residential and recreational developments. The residential development is proposed to include 123 single detached dwellings, 272 semidetached dwellings, and 193 townhouses. Most of these dwellings will have an access to Moore Drive and only 42 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 are a right turn lane for the southbound direction and 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 intersection, 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.

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** and **Table 2**.

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

It is worth noting that no pedestrian movements were observed during the peak hours at both 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 3** and **Table 4**. 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, all the approaches maintain the same LOSs over the study period except for the AM peak hour in 2031. 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).

Table 3 - 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 4 - 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)

3.0 Auxiliary Lanes Warrant Analyses based on the Background Traffic Condition

The warrants for auxiliary lanes were examined on CR 28 at the intersection of CR 28 and Moore Drive 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 5** 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 5 – 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, **Table 6** summarizes the left turn lane warrant calculations. As shown in the table, the percentages of the left turning volumes to the advanced volumes are

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

significantly low and far from 5%, and hence, a left turn lane is not warranted at the intersection of CR 28 and Syer Line.

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 direction are less than 20 veh/hour for the current and future scenarios.

Table 6 – 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

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 units types, and the corresponding trip generation rates are shown in **Table 7**. 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 7 - 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%

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

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 8**. 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 82 single detached, 272 semi detached dwelling units, and 193 townhouses. The other part has a direct access to CR 28 and it consists of 42 single detached dwelling units as shown in **Table 8**.

Table 8 - 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	81	61	15	46	82	52	30
Semi-detached dwelling unit	272	204	51	153	275	173	102
Townhouses	193	85	14	70	100	67	33
Total		350	81	269	457	292	165
Second part of residential component with direct access to CR 28							
Single detached dwelling unit	42	32	8	24	42	27	16
Total		32	8	24	42	27	16

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 9**. 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 9 - 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%
Existing Event Stage	**441**	0	0	0	0.02	50%	50%
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 existing event stage 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 10 - 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)	220	114	63	51	134	78	56
Existing Casino (GFA – ft²)	50000	0	0	0	672	376	295
Horse Racetrack (spectators)	2000	20	18	2	440	400	40
Total		134	81	53	1026	654	372

Table 10 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.

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 5,000 raked seats in addition to 10,000 lawn seating capacity. The total maximum capacity for a sold-out event will be 15,000 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

[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.

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 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 the 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 3,308 vehicle/hour is anticipated to arrive to the site during the peak arrival hour. This is calculated as follow 15,000 (total attendees)*0.95 (automobile usage)*.65 (maximum arrival percentage)/2.8 (vehicle occupancy rate). As discussed, 2,316 vehicle/hour (70% of the traffic) will use the main entrance (for entering and exiting), while the remaining 992 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 11**. For the residential component, the trip distribution ratios are estimated based on the actual traffic counts at CR 28 and Moore Drive.

Table 11 - 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 11**, the number of trips generated by the development shown in **Table 8**, the trip distribution on the turning movements of CR 28 and Moore Drive intersection due to the residential component is presented in **Table 12**.

Table 12 - The Turning Movement Volumes Added to the Intersection of CR 28 and Moore Drive

Peak Hour	EBL	EBR	NBL	NBT	SBT	SBR
AM	148	121	44	0	0	36
PM	70	95	124	0	0	168

Similarly, the turning movements at the entrance of the residential part that has direct access to CR 28 are shown in **Table 13.**

Table 13 - The Turning Movement Volumes Added to CR 28 at the Entrance of the Residential Component

Peak Hour	EBL	EBR	NBL	NBT	SBT	SBR
AM	13	11	4	0	0	4
PM	7	9	11	0	0	15

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 14**. For the recreational component, the trip distribution ratios are estimated based on the actual traffic counts at CR 28 and Syer Line intersection.

Table 14 - 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 14**, the number of trips generated by the recreational development shown in **Table 10** will be distributed on the turning movements at the main and secondary entrance of the recreational development is presented in **Table 15** and **Table 16.**

Table 15 - 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	30	24	45	0	0	36
PM	157	214	277	0	0	377

Table 16 - 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.

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 17 – 21**. It is worth mentioning that the volumes in **Table 17** and **Table 18** are based on the background traffic at CR 28 and Moore Drive, while the volumes in **Table 19**, **Table 20**, and **Table 21** 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.

Table 17 - The Turning Movements at the Intersection of CR 28 and Moore Drive

	EBL	EBR	NBL	NBT	SBT	SBR
AM Peak Hour						
2021	165	141	61	459	390	45
2026	167	143	63	502	426	46
2031	169	146	64	550	466	47
PM Peak Hour						
2021	87	117	151	480	939	188
2026	89	119	153	513	984	190
2031	91	122	154	550	1035	193

Table 18 - The Turning Movements at the Residential Component Entrance on CR 28

	EBL	EBR	NBL	NBT	SBT	SBR
AM Peak Hour						
2021	13	11	4	507	528	4
2026	13	11	4	552	566	4
2031	13	11	4	602	608	4
PM Peak Hour						
2021	7	9	11	624	1050	15
2026	7	9	11	659	1098	15
2031	7	9	11	698	1151	15

Table 19 - 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	466	475	8
2026	1	1	10	507	507	8
2031	1	1	10	551	542	8
PM Peak Hour						
2021	8	11	85	723	957	115
2026	8	11	85	768	1007	115
2031	8	11	85	817	1062	115

Table 20 - The Turning Movements at the Main Entrance of the Recreational Component on CR 28

	EBL	EBR	NBL	NBT	SBT	SBR
AM Peak Hour						
2021	9	9	5	483	459	4
2026	10	10	6	522	491	4
2031	11	11	6	566	526	5
PM Peak Hour						
2021	9	6	8	918	787	9
2026	10	7	9	962	836	10
2031	11	7	10	1011	890	11

Table 21 - 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	483	459	4
2026	10	10	6	522	491	4
2031	11	11	6	566	526	5
PM Peak Hour						
2021	9	6	8	918	787	9
2026	10	7	9	962	836	10
2031	11	7	10	1011	890	11

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.

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 22** and **Table 23**.

Table 22 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	1158	745	256	1158
2026	0	0	1158	771	283	1158
2031	0	0	1158	800	312	1158

Table 23 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	496	249	1414	496
2026	0	0	496	275	1441	496
2031	0	0	496	304	1470	496

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 5090 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 50/50. Accordingly, the traffic exiting the main entrance will be 1781 vehicles turning right on CR 28 and 1781 vehicles turning left on CR 28. Similarly, the secondary entrance will be used by 763 vehicles turning right on CR 28 and 763 vehicles turning left on CR 28. The turning volumes at the entrances are presented in **Table 27** and **Table 28**.

Table 24 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	1781	1781	0	249	1019	0
2026	1781	1781	0	275	1046	0
2031	1781	1781	0	304	1075	0

Table 25 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	763	763	0	2030	256	0
2026	763	763	0	2056	283	0
2031	763	763	0	2085	312	0

4.4 Existing and Future Traffic Operation with the Subdivision 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 17** and **Table 21.** The results summary is presented in **Table 26** and **Table 27**. 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=0.381 in 2031 scenario) which indicates the traffic will operate at an acceptable level.

Table 26 – 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	3.243 (F)	0.096 (A)	-
2026	3.896 (F)	0.104 (A)	-
2031	4.863 (F)	0.111 (A)	-
PM Peak Hour			
2021	6.458 (F)	0.399 (C)	-
2026	8.855 (F)	0.428 (C)	-
2031	12.522 (F)	0.46 (C)	-

* LOS (v/c ratio)

Table 27 – 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	0.1 (C)	0.006 (A)	-
2026	0.123 (C)	0.007 (A)	-
2031	0.152 (C)	0.008 (A)	-
PM Peak Hour			
2021	0.229 (E)	0.012 (A)	-
2026	0.297 (F)	0.014 (B)	-
2031	0.381 (F)	0.016 (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 Syer Line intersection with CR 28 is minimal and most of this minimal impact will be noticed on Syer Line, which is the side road. It is worth mentioning that it is known to our team that the intersection of Whitfield Road and CR 28 needs improvements to enhance the traffic operation at this intersection. Accordingly, these improvements will have an impact on the intersection of CR 28 and Syer Line. Therefore, the intersection of CR 28 and Syer Line should be re-evaluated 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 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

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

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 17** and according to the County's guidelines, a full-width right turn lane will be required.

5.2 The Intersection of CR 28 and Residential Component Entrance

As shown in **Table 28,** 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.

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

	V_L	V_A	LT%	V_O
AM Peak				
2021	4	511	1%	532
2026	4	556	1%	570
2031	4	606	1%	611
PM Peak				
2021	11	635	2%	1065
2026	11	670	2%	1113
2031	11	709	2%	1166

Based on the right turning traffic volumes anticipated for the southbound direction (ranging from 4 to 15 veh/hr during the AM and PM peak in 2031 as shown in **Table 18**), a right turn taper is not warranted since the volumes are less than 20 veh/hr based on the County of Peterborough guidelines.

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

Table 29 shows the left-turn lane calculations. For the AM peak, the anticipated percentage of the left turning vehicle is low, while for 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 19**), a full-width right turn lane and a taper are warranted.

Table 29 – Left Turning Volume Calculations for Recreational Component Secondary Entrance on CR 28

	V_L	V_A	LT%	V_O
AM Peak				
2021	10	476	2%	483
2026	10	517	2%	515
2031	10	561	2%	550
PM Peak				
2021	85	808	10%	1073
2026	85	853	10%	1122
2031	85	902	9%	1177

5.4 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.

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 17**. Accordingly, the AHVs for this intersection are shown in **Table 30**.

Table 30 – AHV based on Peak Hours for CR 28 and Moore Drive Intersection

	EBL	EBT	NBL	NBT	SBT	SBR
2031 (AM Peak)	84	73	32	275	233	24
2031 (PM Peak)	45	61	77	275	517	96

Based on the estimated AHVs, the analysis for Justification 7 was conducted as shown in **Table 31**. 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 31 – Traffic Signal Warrant Calculations for CR 28 and Moore Drive Intersection

Justification	Guidance Approach Lanes (2 or more lane)	20% Threshold Increase as per OTM	Estimated AHV	COMPLIANCE %
Flow Condition	**Restricted Flow**			
AM Peak Hour				
1. Minimum Vehicular Volume	480	576	721	125%
	120	216*	157	73%
2. Delay to Cross Traffic	480	576	564	98%
	50	60	84	140%
PM Peak Hour				
1. Minimum Vehicular Volume	480	576	1072	186%
	120	216*	106	49%
2. Delay to Cross Traffic	480	576	966	168%
	50	60	45	75%

* 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 31,** 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 26**), which is anticipated in the future when the development is in full operation.

6.2 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 18**. Accordingly, the AHVs for this intersection are shown in **Table 32.**

Table 32 – AHV based on Peak Hours for CR 28 and the Entrance of the Residential Component

	EBL	EBT	NBL	NBT	SBT	SBR
2031 (AM Peak)	6	5	2	301	304	2
2031 (PM Peak)	3	5	6	349	575	8

Table 33 – Traffic Signal Warrant Calculations for CR 28 and Moore Drive Intersection

Justification	Guidance Approach Lanes (2 or more lane)	20% Threshold Increase as per OTM	Estimated AHV	COMPLIANCE %
Flow Condition	**Restricted Flow**			
AM Peak Hour				
1. Minimum Vehicular Volume	480	576	620	108%
	120	216*	12	5%
2. Delay to Cross Traffic	480	576	609	106%
	50	60	6	11%
PM Peak Hour				
1. Minimum Vehicular Volume	480	576	946	164%
	120	216*	8	4%
2. Delay to Cross Traffic	480	576	938	163%
	50	60	3	5%

* 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 32**. 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.

6.3 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.

6.3.1 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 19**. Accordingly, the AHVs for this intersection are shown in **Table 34.**

Table 34 – 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	409	531	58

Table 35 – Traffic Signal Warrant Calculations for the Secondary Entrance CR 28 and Moore Drive Intersection

Justification	Guidance Approach Lanes (2 or more lane)	20% Threshold Increase as per OTM	Estimated AHV	COMPLIANCE %
Flow Condition	**Restricted Flow**			
1. Minimum Vehicular Volume	480	576	1050	182%
	120	216*	10	5%
2. Delay to Cross Traffic	480	576	1040	181%
	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 35**. 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.

6.3.2 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 24**. Accordingly, the AHVs for this intersection are shown in **Table 36.**

Table 36 – 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)	382	382	0	1015	128	0

Based on the estimated AHVs, the analysis for Justification 7 was conducted as shown in **Table 37**. 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.

Table 37 – Traffic Signal Warrant Calculations for the Secondary Entrance of the Recreational Component after the End of the Sold-out Event

Justification	Guidance Approach Lanes (2 or more lane)	20% Threshold Increase as per OTM	Estimated AHV	COMPLIANCE %
Flow Condition	**Restricted Flow**			
1. Minimum Vehicular Volume	480	576	1907	331%
	120	216*	763	353%
2. Delay to Cross Traffic	480	576	1143	198%
	50	60	382	636%

6.4 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.

6.4.1 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 20**. Accordingly, the AHVs for this intersection are shown in **Table 38.**

Table 38 – AHV based on the PM Peak Hour at the Main Entrance of the Recreational Component

	EBL	EBT	NBL	NBT	SBT	SBR
2021 (PM Peak)	79	107	138	325	291	189

Table 39 – Traffic Signal Warrant Calculations for the Main Entrance of the Recreational Development on CR 28

Justification	Guidance Approach Lanes (2 or more lane)	20% Threshold Increase as per OTM	Estimated AHV	COMPLIANCE %
Flow Condition	**Restricted Flow**			
1. Minimum Vehicular Volume	480	576	1129	196%
	120	216*	186	86%
2. Delay to Cross Traffic	480	576	943	164%
	50	60	79	131%

* 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 39**. 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.

6.4.2 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 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.

7.0 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.

- 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.

Sincerely,

Mostafa Tawfeek

Mostafa H Tawfeek, Ph.D., RSP1	Wes Kingdon, P.Eng.
Traffic/Transportation EIT	Project Engineer
D.M. Wills Associates Limited	D.M. Wills Associates Limited

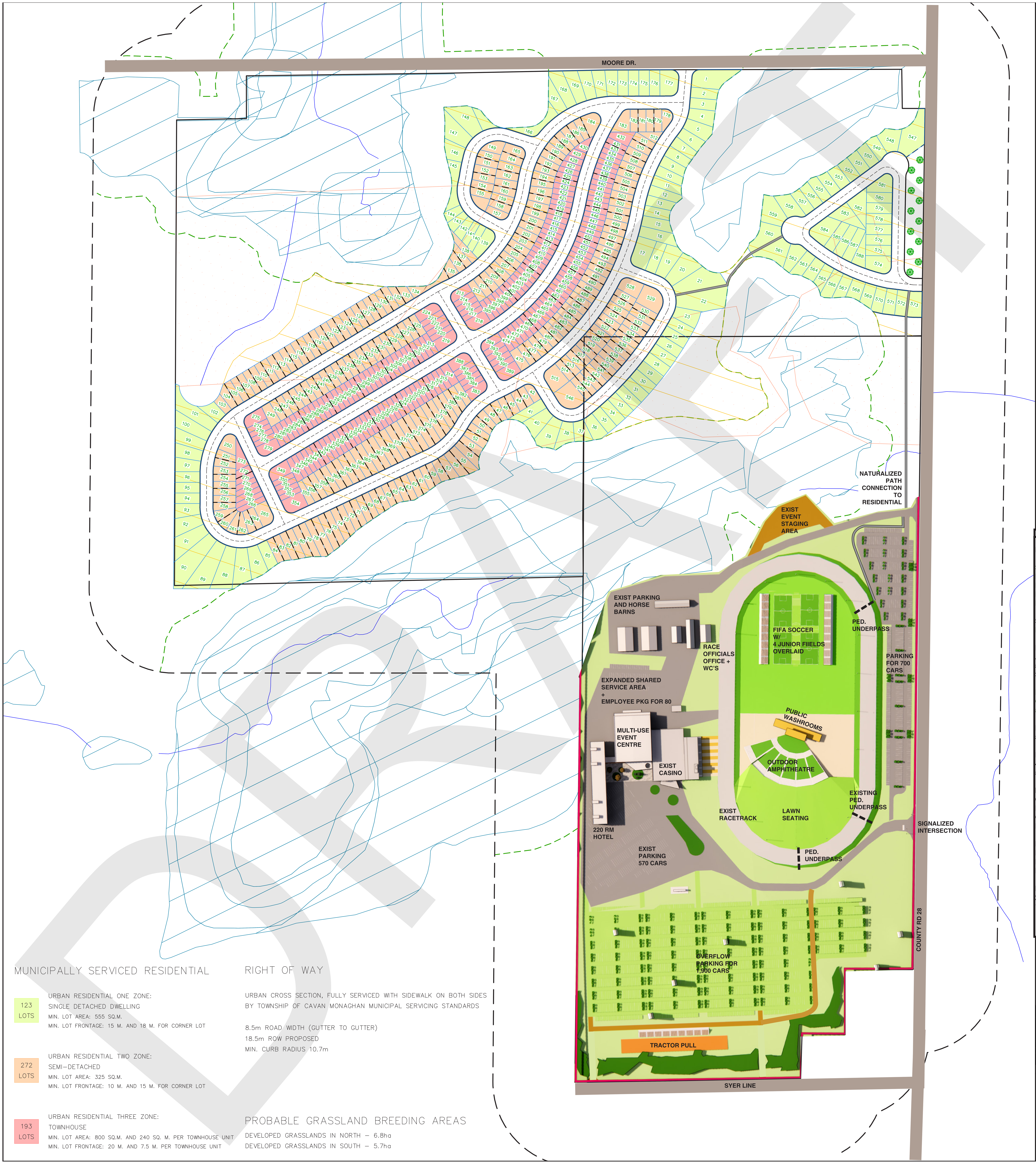
Appendix A

Location Plan

***Not to scale. Approximate location for illustration only.**

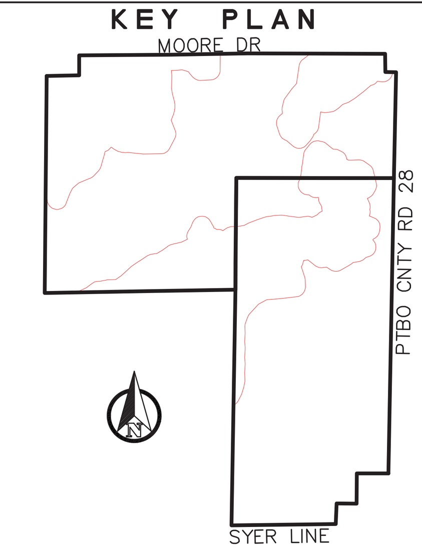
Appendix B

Draft Plan of Kawartha Downs Redevelopment



TRUE NORTH

KEY PLAN



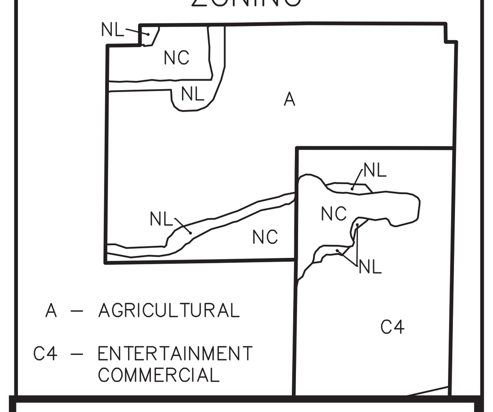
REVISIONS		
No.	Description	Date
1	PRE-CONSULTATION DRAFT	21/10/21

Plot Date: 18/10/2021 SCALE: Horz. 1:2000 Vert. N/A

0 50 100 Meters

PROBABLE BREEDING GRASSLANDS
DEVELOPMENT AREA
WETLAND
WATERCOURSE
30m WETLAND SETBACK
WETLAND
120m ADJACENT AREA
3m WALKWAY

ZONING



A – AGRICULTURAL
C4 – ENTERTAINMENT COMMERCIAL

KAWARTHA DOWNS SITE PROPOSAL

SITE AREA: 115 acres
EXIST PARKING: 570
EXIST OVAL INFIELD: 13 acres
EXIST BARNS/SERVICE BUILDINGS: 36,400 sf total

SPECTATORS:
EXIST GRANDSTAND: 2000

EVENT CENTRE: 3200
AMPHITHEATRE:
5000 raked, 10,000 grass
SOCCER PITCHES: 2800

EXIST CASINO AND GRANDSTAND:
50,000 sf

PUBLIC WC'S:
5000 sf

EVENT CENTRE:
43,000 sf footprint
54,000 sf gfa

Indoor multi-use field
Changerooms
Public social space
Offices and administration
Permanent seating for 1000

Event stage
Back-of-house
Retractable seating for 1000
Floor-level seating for 1200

HOTEL
26,500 sf footprint
106,000 sf gfa

MJMA
maclennan jaunkalns miller architects

WILLS

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Project Name/Location

KAWARTHA DOWNS REDEVELOPMENT
FRASERVILLE, ON

Drawing Title

PRE–CONSULTATION DRAFT PLAN

NOT FOR CONSTRUCTION

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

Traffic Count Map

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

Traffic Count Summary

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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**

Traffic Count Summary

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

Moore Dr - Traffic Summary

Hour	East Approach Totals (Includes Cars, Trucks, Bicycles) Left	Thru	Right	U-Turn	Total	Peds	West Approach Totals (Includes Cars, Trucks, Bicycles) 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

	Cars					Trucks					Bicycles					
Start Time	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	↰	↑	↱	↶	Total	Total Peds
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

Traffic Count Data

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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
	Left	Thru	Right	U-Turn	Total	Left	Thru	Right	U-Turn	Total	Left	Thru	Right	U-Turn	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**

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 ↰	Cars ↑	Cars ↱	Cars U-turn	Cars Total	Trucks ↰	Trucks ↑	Trucks ↱	Trucks U-turn	Trucks Total	Bicycles ↰	Bicycles ↑	Bicycles ↱	Bicycles U-turn	Bicycles Total	Total Peds
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

Bicycles	Trucks	Cars	Totals
0	0	0	**0**
0	8	9	**17**
0	1	19	**20**

Peds: 0

N
W E
S

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)

	North Approach Peterborough Rd 28						South Approach Peterborough Rd 28						East Approach						West Approach Moore Dr						Total Vehicles
Start Time	↰	↑	↱	↶	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	-	

Peak Hour Diagram

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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 (southbound)

	Right	Thru	U-turn
Bicycles	0	3	0
Trucks	2	27	0
Cars	6	351	0
Totals	**8**	**381**	**0**

Peds: 0

Moore Dr

Bicycles	Trucks	Cars	Totals	
0	0	0	**0**	U-turn
0	6	6	**12**	Left
0	2	9	**11**	Right

Peds: 0

N / W / E / S

Peds: 0

Peds: 0

West Approach

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

Peterborough Rd 28 (northbound)

	Left	Thru	U-turn
Totals	**8**	**365**	**0**
Cars	8	340	0
Trucks	0	25	0
Bicycles	0	0	0

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
	Left	Thru	Right	U-Turn	Peds	Total	Left	Thru	Right	U-Turn	Peds	Total	Left	Thru	Right	U-Turn	Peds	Total	Left	Thru	Right	U-Turn	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

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

Specified Period		One Hour Peak	
From:	14:00:00	From:	15:30:00
To:	18:00:00	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 (southbound)

	Right	Through	U-turn
Bicycles	0	0	0
Trucks	0	22	0
Cars	20	418	0
Totals	**20**	**440**	**0**

Peds: 0

Moore Dr

	Bicycles	Trucks	Cars	Totals
U-turn	0	0	0	**0**
Left	0	0	17	**17**
Right	0	0	22	**22**

Peds: 0

N W E S

Peds: 0

Peds: 0

West Approach

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

Peterborough Rd 28 (northbound)

	Left	Through	U-turn
Totals	**12**	**323**	**0**
Cars	11	297	0
Trucks	1	26	0
Bicycles	0	0	0

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
	Left	Thru	Right	U-Turn	Peds	Total	Left	Thru	Right	U-Turn	Peds	Total	Left	Thru	Right	U-Turn	Peds	Total	Left	Thru	Right	U-Turn	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

Traffic Count Map

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

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

Hour	North Approach Totals (Includes Cars, Trucks, Bicycles)						South Approach Totals (Includes Cars, Trucks, Bicycles)						Total
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
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**

Traffic Count Summary

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

Syer Line - Traffic Summary

Hour	East Approach Totals						West Approach Totals						Total
	Includes Cars, Trucks, Bicycles						Includes Cars, Trucks, Bicycles						
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
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**

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
	Left	Thru	Right	U-Turn	Total	Left	Thru	Right	U-Turn	Total	Left	Thru	Right	U-Turn	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**

Traffic Count Data

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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**

Traffic Count Data

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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
	←	↑	→	U-turn	Total	←	↑	→	U-turn	Total	←	↑	→	U-turn	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**

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

	Right	Thru	U-turn
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**	U-turn
0	0	9	**9**	Left
1	0	8	**9**	Right

Peds: 0

N W E S

Peds: 0

Peds: 0

West Approach

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

	Left	Thru	U-turn
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	-	

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

	Right	Through	U-turn
Bicycles	0	0	0
Trucks	0	24	0
Cars	6	303	0
Totals	**6**	**327**	**0**

Peds: 0

Syer Line

Bicycles	Trucks	Cars	Totals	Movement
0	0	0	**0**	U-turn
0	2	6	**8**	Left
0	0	5	**5**	Right

Peds: 0

N
W E
S

Peds: 0

Peds: 0

West Approach

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

	Left	Through	U-turn
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
	↰	↑	↱	U-turn	Peds	Total	↰	↑	↱	U-turn	Peds	Total	↰	↑	↱	U-turn	Peds	Total	↰	↑	↱	U-turn	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	-	

Peak Hour Diagram

Ontario Traffic Inc.
Traffic Monitoring • Services & Products

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 (North)

	Right	Through	U-Turn
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**	U-Turn
0	1	8	**9**	Left
0	0	6	**6**	Right

Peds: 0

N
W E
S

Peds: 0

Peds: 0

West Approach

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

Peterborough Rd 28 (South)

	Left	Through	U-Turn
Totals	**8**	**422**	**0**
Cars	8	397	0
Trucks	0	25	0
Bicycles	0	0	0

South Approach

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

- Cars - Trucks - Bicycles

Comments

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	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	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	0.9

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	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	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	-	-	-	-	-

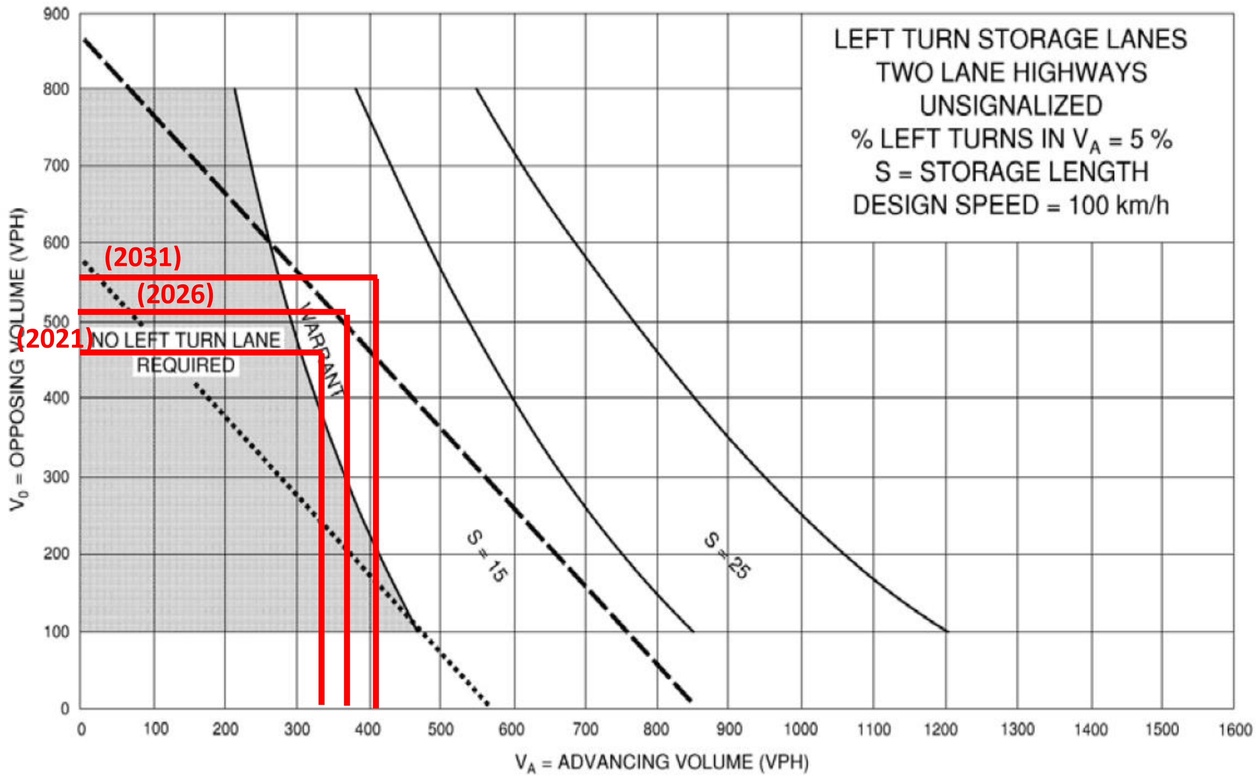
Approach	EB	NB	SB
HCM Control Delay, s	21.6	0.2	0
HCM LOS	C		

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	-	-

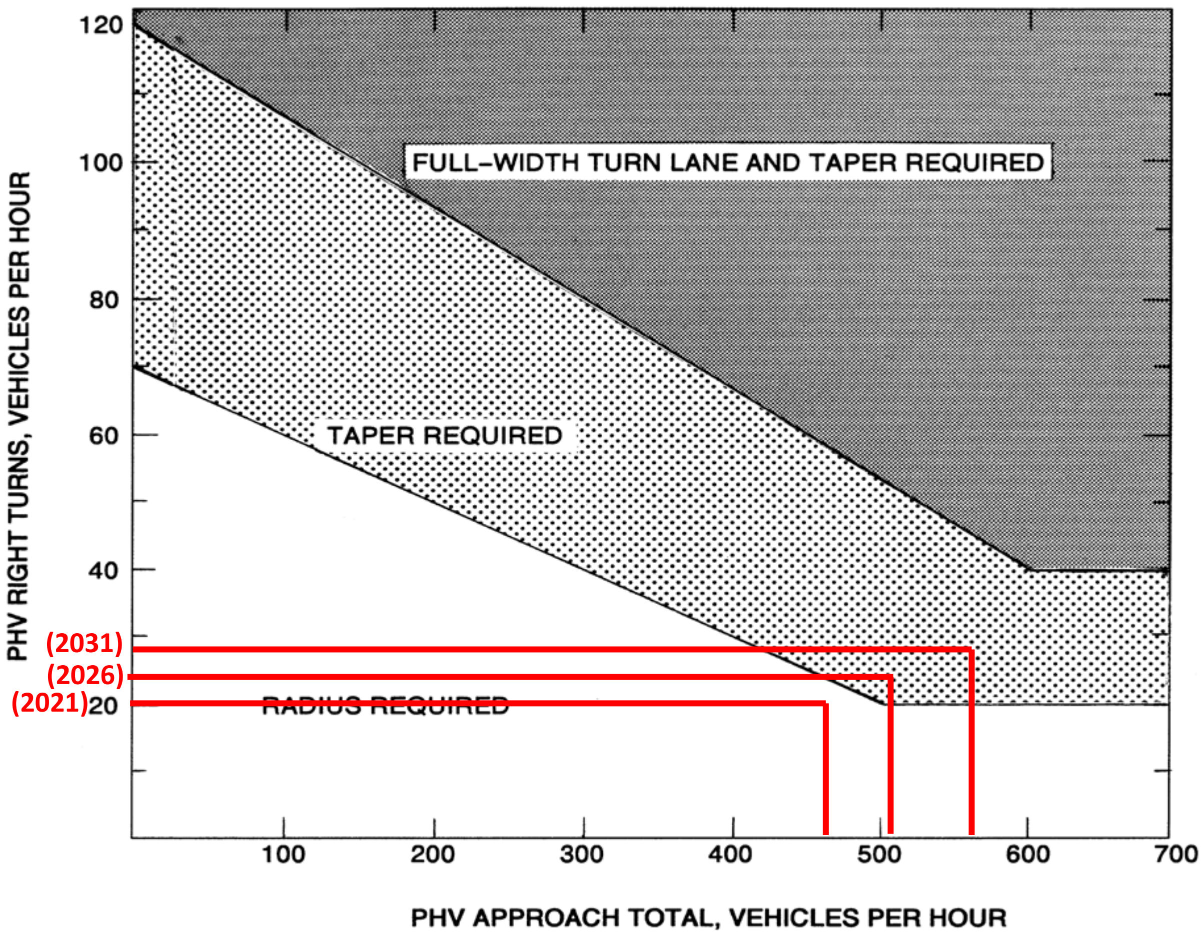
Appendix F

Auxiliary Lanes Analysis

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



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



Appendix G

Synchro Reports for the Traffic Conditions with the Developments

Intersection	
Int Delay, s/veh	323.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	165	141	61	459	390	45
Future Vol, veh/h	165	141	61	459	390	45
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	324	276	90	675	542	63

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1429	574	605	0	-	0
Stage 1	574	-	-	-	-	-
Stage 2	855	-	-	-	-	-
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	~ 142	502	930	-	-	-
Stage 1	546	-	-	-	-	-
Stage 2	402	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 120	502	930	-	-	-
Mov Cap-2 Maneuver	~ 120	-	-	-	-	-
Stage 1	461	-	-	-	-	-
Stage 2	402	-	-	-	-	-

Approach	EB		NB		SB	
HCM Control Delay, s	$ 1061.3		1.1		0	
HCM LOS	F					

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	930	-	185	-	-
HCM Lane V/C Ratio	0.096	-	3.243	-	-
HCM Control Delay (s)	9.3	0	$ 1061.3	-	-
HCM Lane LOS	A	A	F	-	-
HCM 95th %tile Q(veh)	0.3	-	55.9	-	-

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	483	459	4
Future Vol, veh/h	9	9	5	483	459	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	562	546	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1123	549	551	0	-	0
Stage 1	549	-	-	-	-	-
Stage 2	574	-	-	-	-	-
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	230	539	980	-	-	-
Stage 1	583	-	-	-	-	-
Stage 2	567	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	228	539	980	-	-	-
Mov Cap-2 Maneuver	228	-	-	-	-	-
Stage 1	578	-	-	-	-	-
Stage 2	567	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.5	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	980	-	320	-	-
HCM Lane V/C Ratio	0.006	-	0.1	-	-
HCM Control Delay (s)	8.7	0	17.5	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.3	-	-

Intersection	
Int Delay, s/veh	395.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	167	143	63	502	426	46
Future Vol, veh/h	167	143	63	502	426	46
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	327	280	93	738	592	64

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1548	624	656	0	-	0
Stage 1	624	-	-	-	-	-
Stage 2	924	-	-	-	-	-
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	~ 120	469	890	-	-	-
Stage 1	517	-	-	-	-	-
Stage 2	373	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 99	469	890	-	-	-
Mov Cap-2 Maneuver	~ 99	-	-	-	-	-
Stage 1	425	-	-	-	-	-
Stage 2	373	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 1361.8	1.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	890	-	156	-	-
HCM Lane V/C Ratio	0.104	-	3.896	-	-
HCM Control Delay (s)	9.5	0	$ 1361.8	-	-
HCM Lane LOS	A	A	F	-	-
HCM 95th %tile Q(veh)	0.3	-	60.3	-	-

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	522	491	4
Future Vol, veh/h	10	10	6	522	491	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	607	585	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1209	588	590	0	-	0
Stage 1	588	-	-	-	-	-
Stage 2	621	-	-	-	-	-
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	204	513	947	-	-	-
Stage 1	559	-	-	-	-	-
Stage 2	540	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	202	513	947	-	-	-
Mov Cap-2 Maneuver	202	-	-	-	-	-
Stage 1	553	-	-	-	-	-
Stage 2	540	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.2	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	947	-	290	-	-
HCM Lane V/C Ratio	0.007	-	0.123	-	-
HCM Control Delay (s)	8.8	0	19.2	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Intersection						
Int Delay, s/veh	500.1					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	169	146	64	550	466	47
Future Vol, veh/h	169	146	64	550	466	47
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	331	286	94	809	647	65

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1677	680	712	0	-	0
Stage 1	680	-	-	-	-	-
Stage 2	997	-	-	-	-	-
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	~ 99	436	848	-	-	-
Stage 1	487	-	-	-	-	-
Stage 2	344	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 79	436	848	-	-	-
Mov Cap-2 Maneuver	~ 79	-	-	-	-	-
Stage 1	389	-	-	-	-	-
Stage 2	344	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 1806.8	1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	848	-	127	-	-
HCM Lane V/C Ratio	0.111	-	4.863	-	-
HCM Control Delay (s)	9.8	0	$ 1806.8	-	-
HCM Lane LOS	A	A	F	-	-
HCM 95th %tile Q(veh)	0.4	-	64.9	-	-

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	566	526	5
Future Vol, veh/h	11	11	6	566	526	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	658	626	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1301	629	632	0	-	0
Stage 1	629	-	-	-	-	-
Stage 2	672	-	-	-	-	-
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	179	486	913	-	-	-
Stage 1	535	-	-	-	-	-
Stage 2	511	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	177	486	913	-	-	-
Mov Cap-2 Maneuver	177	-	-	-	-	-
Stage 1	529	-	-	-	-	-
Stage 2	511	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21.4	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	913	-	259	-	-
HCM Lane V/C Ratio	0.008	-	0.152	-	-
HCM Control Delay (s)	9	0	21.4	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

Intersection	
Int Delay, s/veh	271.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	87	117	151	480	939	188
Future Vol, veh/h	87	117	151	480	939	188
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	107	144	168	533	1269	254

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2265	1396	1523	0	-	0
Stage 1	1396	-	-	-	-	-
Stage 2	869	-	-	-	-	-
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	~ 44	169	421	-	-	-
Stage 1	225	-	-	-	-	-
Stage 2	404	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 19	169	421	-	-	-
Mov Cap-2 Maneuver	~ 19	-	-	-	-	-
Stage 1	~ 97	-	-	-	-	-
Stage 2	404	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 2658	4.6	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	421	-	39	-	-
HCM Lane V/C Ratio	0.399	-	6.458	-	-
HCM Control Delay (s)	19.1	0	$ 2658	-	-
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	0.7					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	9	6	8	918	787	9
Future Vol, veh/h	9	6	8	918	787	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	987	894	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1904	899	904	0	-	0
Stage 1	899	-	-	-	-	-
Stage 2	1005	-	-	-	-	-
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	73	331	736	-	-	-
Stage 1	389	-	-	-	-	-
Stage 2	346	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	71	331	736	-	-	-
Mov Cap-2 Maneuver	71	-	-	-	-	-
Stage 1	378	-	-	-	-	-
Stage 2	346	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	49.6	0.1	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	736	-	104	-	-
HCM Lane V/C Ratio	0.012	-	0.229	-	-
HCM Control Delay (s)	9.9	0	49.6	-	-
HCM Lane LOS	A	A	E	-	-
HCM 95th %tile Q(veh)	0	-	0.8	-	-

Intersection						
Int Delay, s/veh	379					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	89	119	153	513	984	190
Future Vol, veh/h	89	119	153	513	984	190
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	110	147	170	570	1330	257

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2369	1459	1587	0	-	0
Stage 1	1459	-	-	-	-	-
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	~ 37	155	397	-	-	-
Stage 1	209	-	-	-	-	-
Stage 2	386	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 14	155	397	-	-	-
Mov Cap-2 Maneuver	~ 14	-	-	-	-	-
Stage 1	~ 78	-	-	-	-	-
Stage 2	386	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 3798.6	4.8	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	397	-	29	-	-
HCM Lane V/C Ratio	0.428	-	8.855	-	-
HCM Control Delay (s)	20.7	0	$ 3798.6	-	-
HCM Lane LOS	C	A	F	-	-
HCM 95th %tile Q(veh)	2.1	-	31.5	-	-

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

Intersection						
Int Delay, s/veh	0.9					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	7	9	962	836	10
Future Vol, veh/h	10	7	9	962	836	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	1034	950	11

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2010	956	961	0	-	0
Stage 1	956	-	-	-	-	-
Stage 2	1054	-	-	-	-	-
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	63	306	700	-	-	-
Stage 1	366	-	-	-	-	-
Stage 2	328	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	61	306	700	-	-	-
Mov Cap-2 Maneuver	61	-	-	-	-	-
Stage 1	354	-	-	-	-	-
Stage 2	328	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	60.4	0.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	700	-	91	-	-
HCM Lane V/C Ratio	0.014	-	0.297	-	-
HCM Control Delay (s)	10.2	0	60.4	-	-
HCM Lane LOS	B	A	F	-	-
HCM 95th %tile Q(veh)	0	-	1.1	-	-

Intersection	
Int Delay, s/veh	540.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	91	122	154	550	1035	193
Future Vol, veh/h	91	122	154	550	1035	193
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	112	151	171	611	1399	261

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2483	1530	1660	0	-	0
Stage 1	1530	-	-	-	-	-
Stage 2	953	-	-	-	-	-
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	~ 32	~ 141	372	-	-	-
Stage 1	193	-	-	-	-	-
Stage 2	368	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	~ 10	~ 141	372	-	-	-
Mov Cap-2 Maneuver	~ 10	-	-	-	-	-
Stage 1	~ 59	-	-	-	-	-
Stage 2	368	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	$ 5541.4	5	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	372	-	21	-	-
HCM Lane V/C Ratio	0.46	-	12.522	-	-
HCM Control Delay (s)	22.7	0	$ 5541.4	-	-
HCM Lane LOS	C	A	F	-	-
HCM 95th %tile Q(veh)	2.3	-	33.2	-	-

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

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	7	10	1011	890	11
Future Vol, veh/h	11	7	10	1011	890	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	1087	1011	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2127	1018	1024	0	-	0
Stage 1	1018	-	-	-	-	-
Stage 2	1109	-	-	-	-	-
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	53	282	663	-	-	-
Stage 1	341	-	-	-	-	-
Stage 2	309	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	51	282	663	-	-	-
Mov Cap-2 Maneuver	51	-	-	-	-	-
Stage 1	327	-	-	-	-	-
Stage 2	309	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	79.9	0.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	663	-	75	-	-
HCM Lane V/C Ratio	0.016	-	0.381	-	-
HCM Control Delay (s)	10.5	0	79.9	-	-
HCM Lane LOS	B	A	F	-	-
HCM 95th %tile Q(veh)	0	-	1.5	-	-